Alcohol and Drug-Related Overdose Deaths in Maryland: 1997-2001

An Examination of Data from the Office of the Chief Medical Examiner

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Executive Summary

This report summarizes the analyses of five years of data (1997-2001) on alcohol and drug-related overdose deaths obtained from the Office of the Chief Medical Examiner in Maryland. Trends over time are examined with regard to both the type of overdose death and the demographic characteristics of decedents.

Some important highlights from this report are:

- In 2001, there were 559 overdose deaths associated with alcohol and/or illicit drugs in Maryland.
- Over the time period 1997-2001, overall overdose deaths have increased 16%.
- Overdoses associated with a single drug exposure accounted for the majority of deaths every year.
- In 2001, two-thirds of the deaths were attributable to overdose of a single drug.
- In 2001, narcotics were the most commonly mentioned drug in overdose deaths (82% of the cases), followed by alcohol (25%), and cocaine (19%).
- In the past five years, males have outnumbered females in overdose deaths. The proportion of females dying of alcohol and drug overdoses, however, has increased since 1997. Female overdose deaths have increased from 68 overdoses in 1997 (14% of the total) to 120 in 2001 (21% of the total).
- The highest proportion (nearly three-quarters in 2001) of overdose deaths is concentrated among people 31-50. This proportion is very stable over time.
- Although overdose deaths among both whites and blacks have increased since 1997, the increase among whites has been greater than among blacks.
- The Baltimore City and Central Maryland regions account for about 80% of all overdose deaths in Maryland each year, although every region in Maryland had at least one overdose per year.
- Although small in number, a notable increase in methadone-related overdose deaths was observed (from 2 to 21 deaths from 1997-2001). Females accounted for almost 40% of these deaths in 2001.

Introduction

Alcohol and Drug Overdose Mortality

In the United States in 2000, an estimated 34,391 individuals died as a result of alcohol poisoning, drug overdoses, the ingestion of a combination of alcohol and drugs, or other related illnesses.[1] This represents an alcohol and drug-related national mortality rate of 12.2 per 100,000 residents. Using this definition, Maryland's 930 alcohol and drug-related deaths in 2000 is the equivalent of 17.5 per 100,000 residents[2].

This report focuses on a subsample of these deaths, namely, overdose deaths in Maryland. In 2001, 559 individuals died of alcohol and drug-related overdoses, representing a rate of 10.4 deaths per 100,000 residents.

Overdose deaths are monitored as a part of Maryland's Drug Early Warning System (DEWS). This report is a special study of the trends in overdose deaths from 1997-2001. Examining the frequency and pattern of overdose deaths is a valuable way to monitor the scope of the substance abuse problem in a geographic area. Moreover, by analyzing trends in overdose deaths over time, we can identify potential emerging drug problems or vulnerable subpopulations.

Narcotic-related deaths account for the largest proportion —approximately 80%— of overdose deaths in Maryland during the years studied (see Results, page 4). For the most part, trends in overdose deaths have been fairly stable with two notable exceptions: an increase in the proportion of female decedents and an increase in the number, albeit small, of methadone-related overdose deaths. These two potentially emerging problems are further examined in this report in the context of annual trends in overdose deaths, types of overdose deaths occurring, and characteristics of decedents.

Organization of This Report

This report contains two major sections: the Data Sources/Research Methodology section and the Results section. The Data Sources/Research Methodology section provides a detailed description of the source of data for this report. Limitations inherent in any study of overdose mortality are discussed, followed by a list of terms used in the report and their definitions. The Results section is divided into three parts: overall overdose deaths, single drug mentions, and multiple drug mentions. Within these parts, we describe specific demographic characteristics of the decedents of the more common types of overdose deaths. A full summary of the number of annual overdose deaths, broken down by sex, and region is provided in Table A2 (Appendix).

[1] Related illnesses include mental and behavioral disorders due to alcohol use, degeneration of the nervous system because of alcohol, alcoholic polyneuropathy, alcoholic cardiomyopathy, alcoholic gastritis, and alcoholic liver disease. This definition excludes deaths that were indirectly induced by alcohol or drugs resulting from accidents, homicides, or other causes of death (*National Vital Statistics Report*, 49(12), October 9, 2001).

[2] National Center for Health Statistics, Center for Disease Control. *National Vital Statistics Report*, 49(12), October 9, 2001.

Data Sources/Research Methodology

Office of the Chief Medical Examiner

Approximately 43,602 persons died of various causes in Maryland in 2000[3]. By law, the Office of the Chief Medical Examiner of Maryland is required only to investigate deaths of a violent or suspicious nature: homicides, poisonings, suicides, drownings, sudden deaths of apparently healthy individuals, individuals who are dead on arrival to a hospital, and other suspicious or unusual deaths. In 2000, the office completed 3,756 autopsies[4] and completed investigations on a total of 7,710 deaths, 18% of the total deaths in Maryland.

For this report, Drug Early Warning System (DEWS) staff reviewed Medical Examiner overdose death data from the last five years. These data include deaths attributed to toxic levels of alcohol, narcotics, cocaine, methadone, and other drugs.

The database used for these analyses is continually updated. New cases are added as toxicology reports are completed, or cases may be removed as an investigation proceeds. Analyses of deaths occurring between 1997 and 2000 are based on a data set received October 23, 2001, while deaths in 2001 are based on a data set received February 20, 2002.

Limitations of Mortality Data

As mentioned earlier, analyses of overdose deaths can identify emerging drug problems. Nevertheless, certain caveats must be mentioned that are inherent to mortality studies. First, overdose mortality data, for the most part, represent the "tip of the iceberg," and do not necessarily reflect the magnitude of drug use in a community. Mortality from drug overdoses can reflect many things besides the level of drug use, or even drug availability in a given area, including the purity of a particular drug, an individual's tolerance, or access to medical care. Other kinds of data are necessary to gauge the level of use, abuse, and morbidity associated with drug involvement.

It is also important to point out that this study uses secondary data, and therefore is limited in the amount of information it can provide about the details surrounding the deaths. Further, the data relies on the Office of the Chief Medical Examiner for quality control.

Lastly, because most of the trends noted in this report are based on a small number of cases, percentage changes should be interpreted with caution.

[3] National Center for Health Statistics, Center for Disease Control. *National Vital Statistics Report*, 49(12), October 9, 2001.
[4] Not all cases submitted to the Office of the Chief Medical Examiner undergo a full autopsy. In some cases, an autopsy is not necessary. In other cases, family members of the deceased may request that an autopsy not be conducted.

Results

Overall Overdose Deaths

Table 1 presents annual data on the number of overdose deaths[5] that occurred in Maryland from 1997-2001. The total number of overdose deaths (shown as the bottom line of Table 1, below) increased steadily from 482 in 1997 to a peak of 566 in 2000. In 2001, the total number decreased slightly to 559. Overall, the number of alcohol and drug-related overdoses from 1997 to 2001 increased 16% (Table 1).

Overdoses associated with a single drug mention accounted for the majority of deaths every year. For example, these deaths accounted for 66% of overdose deaths in 2001. Table 1 also presents data on the number of deaths having multiple drugs mentioned, either with or without alcohol. The most common type of overdose either alone or in combination with another drug were narcotic-related overdoses (*e.g.,* heroin).

A notable increase in methadone-related overdose deaths is shown in Table 1. More information on these deaths can be found on page 11.

TABLE 1. NUMBER OF ALCOHOL AND DRUG-RELATED OVERDOSE DEATHS BY YEAR: 1997-2001

	1997	1998	1999	2000	2001	% change (97-01)
Single Drug Mentions						
Narcotics-only	215	230	297	263	297	38%
Cocaine-only	30	23	35	27	34	13%
Alcohol-only	11	27	16	19	19	73%
Methadone	2	3	5	14	21	950%
Subtotal Single Drug Mentions	**258**	**283**	**353**	**323**	**371**	**44%**
Multiple Drug Mentions						
Alcohol and Narcotics	96	83	98	135	97	1%
Alcohol and Cocaine	16	10	9	13	9	-44%
Narcotics and Cocaine	92	96	75	77	66	-28%
Alcohol and Other Drugs	20	18	19	18	16	-20%
Subtotal Multiple Drug Mentions	**224**	**207**	**201**	**243**	**188**	**-16%**
TOTAL	**482**	**490**	**554**	**566**	**559**	**16%**

Source: Adapted by the Center for Substance Abuse Research from data supplied by the Office of the Chief Medical Examiner.

[5] Definitions of terms used in this report can be found in the Appendix, beginning on page 15.

Trends over Time

For the most part, overdose deaths in Maryland associated with a *single* drug mention have shown a slight increase from 1997 to 2001. Narcotics-only overdose deaths increased 38% (from 215 to 297 deaths). Cocaine-only overdose deaths increased 13% (from 30 to 34). Less common were alcohol-only overdose deaths, which nonetheless increased 73% since 1997 (from 11 to 19). In addition, methadone overdose deaths steadily increased (from 2 to 21). Single drug overdoses have increased 44% between 1997 and 2001, while multiple drug overdoses have decreased 16% in the same time period (Table 1).

In contrast, overdose deaths in Maryland associated with *multiple* drug mentions have slightly decreased since 1997. Deaths attributed to the combination of cocaine and narcotics decreased 28% (from 92 to 66). Less common were deaths associated with alcohol and cocaine, which decreased 44% (from 16 to 9), and the combination of alcohol with other drugs, which decreased 20% over the five-year time period (from 20 to 16) (Table 1).

Demographic Characteristics

Tables 2 and 3 present data on the total number and proportion of overdoses, by gender, age and race, with more detailed information contained in the Appendix. There are certain notable trends. The proportion of female overdose deaths has been steadily increasing (76%) over the five-year time period (from 68 to 120). While overdose deaths among males continued to outnumber deaths among females in 2001 by a ratio of 3.65:1, this represents a decrease in proportion of males to females from 6:1 in 1997.

The highest proportion of overdose deaths is concentrated among people 31-50. This age group makes up approximately three-quarters of overdose deaths in 2001, a figure that has remained stable over time.

The proportion of overdose deaths among blacks[6] compared to whites decreased from 52% in 1997 to 46% in 2001. In 2001, overdose deaths among whites (n=289) slightly outnumbered overdose deaths among blacks (n=259). Although deaths among both races increased since 1997, deaths among whites have increased more than those among blacks. Overdose deaths among whites increased 27% (from 227 to 289), while overdose deaths among blacks increased less than 5% (from 248 to 259) (data not shown in a table; available by contacting CESAR).

[6] Definitions of races used in this report can be found in the Appendix.

TABLE 2. TOTAL OVERDOSE DEATHS BY GENDER, AGE, AND RACE OF DECEDENT*

	1997 (N=482)	1998 (N=490)	1999 (N=554)	2000 (N=566)	2001 (N=559)
Gender					
Male	414	400	446	447	439
Female	68	89	108	119	120
	1997	**1998**	**1999**	**2000**	**2001**
Age					
Under 18	2	2	3	3	6
18-20	6	7	16	9	11
21-30	75	72	70	71	72
31-40	203	202	205	221	198
41-50	162	168	198	217	212
51-60	21	33	43	41	44
61+	5	5	8	3	9
	1997	**1998**	**1999**	**2000**	**2001**
Race					
White	227	199	271	290	289
Black	248	281	276	272	259
Other or Unspecified	7	9	7	4	10

*Totals may not add to total N due to missing demographic information in some cases.
Source: Adapted by the Center for Substance Abuse Research from data supplied by the Office of the Chief Medical Examiner.

TABLE 3. ANNUAL PERCENTAGE OF ALL OVERDOSE DEATHS BY GENDER, AGE, AND RACE OF DECEDENT*

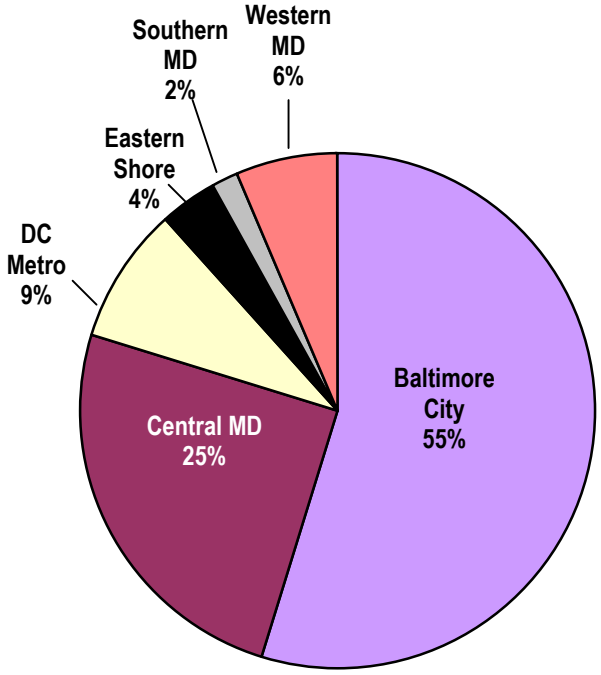
	1997 (N=482)	1998 (N=490)	1999 (N=554)	2000 (N=566)	2001 (N=559)
Gender					
Male	86%	82%	81%	79%	79%
Female	14%	18%	19%	21%	21%
	1997	**1998**	**1999**	**2000**	**2001**
Age					
Under 18	<1%	<1%	<1%	1%	1%
18-20	1%	1%	3%	2%	2%
21-30	16%	15%	13%	13%	13%
31-40	42%	41%	37%	39%	35%
41-50	34%	34%	36%	38%	38%
51-60	4%	7%	8%	7%	8%
61+	1%	1%	1%	1%	2%
	1997	**1998**	**1999**	**2000**	**2001**
Race					
White	52%	57%	50%	48%	46%
Black	47%	41%	49%	51%	52%
Other or Unspecified**	1%	2%	1%	1%	2%

*Percentages may not add to 100% because of rounding.
** Definitions of races used in this report can be found in the Appendix.
Source: Adapted by the Center for Substance Abuse Research from data supplied by the Office of the Chief Medical

Regional Variation

Figure 1 displays the proportion of drug overdoses, by region for 2001. Baltimore City accounted for 55% of all overdose deaths in Maryland in 2001; Central Maryland had the second highest percent of overdose deaths, at 25%. The other regions in Maryland had a smaller number of overdose deaths. The DC Metro region (Montgomery and Prince George's counties) had 48 overdose deaths, just under 9% of the cases for 2001. The Eastern Shore and Southern Maryland regions accounted for 4% and 2% respectively. Western Maryland accounted for 6.4% of the state total in 2001, increasing to 36 cases in 2001 from 8 cases in 1997 (about 1.7% of the state total).

FIGURE 1. PERCENTAGE* OF DRUG OVERDOSES BY REGION, 2001 (N=559) *



*Percentages may not add to 100% because of rounding.
Source: Adapted by the Center for Substance Abuse Research from data supplied by the Office of the Chief Medical Examiner.

Table 4 lists eight mutually exclusive types of drug overdoses by region, for each year. Of the 306 overdose deaths in Baltimore City in 2001, 52% were narcotics-only, 19% were narcotics in combination with alcohol, and 15% were overdoses of narcotics and cocaine combined.[7] The Central Maryland region (Anne Arundel, Baltimore, Harford, and Howard counties) had 140 overdose deaths in 2001, an increase of 47% since 1997.

[7] Percentages calculated from numbers in Table 4 on page 8. For example, percentage of narcotics only overdose deaths in 2001 for Baltimore City would be calculated by dividing the number of narcotics only overdose deaths (159) by the total number of overdoses in Baltimore City that year (306) and multiplying by 100% resulting in 52%.

TABLE 4. ANNUAL NUMBER OF DRUG OVERDOSE DEATHS BY TYPE AND REGION*

Region	Drug or Drug Combination	1997	1998	1999	2000	2001
Baltimore City	Narcotics	122	143	178	157	159
	Cocaine	14	11	17	11	16
	Alcohol	4	11	8	9	8
	Methadone	1	3	3	5	10
	Alcohol & Cocaine	12	9	5	7	4
	Alcohol & Narcotics	70	54	69	94	59
	Narcotics & Cocaine	60	73	55	50	45
	Alcohol & Other Drugs	9	4	8	1	5
	TOTAL BALTIMORE CITY	**292**	**308**	**343**	**334**	**306**
Central Maryland	Narcotics	43	45	76	64	77
	Cocaine	10	9	8	4	5
	Alcohol	1	3	2	3	2
	Methadone	1	0	0	3	6
	Alcohol & Cocaine	1	1	2	2	2
	Alcohol & Narcotics	19	18	17	27	26
	Narcotics & Cocaine	15	15	17	16	15
	Alcohol & Other Drugs	5	8	5	7	7
	TOTAL CENTRAL MARYLAND	**95**	**99**	**127**	**126**	**140**
DC Metro	Narcotics	30	25	24	19	25
	Cocaine	3	3	9	7	5
	Alcohol	4	9	5	4	6
	Methadone	0	0	2	2	2
	Alcohol & Cocaine	3	0	1	1	1
	Alcohol & Narcotics	4	6	8	6	5
	Narcotics & Cocaine	10	5	2	8	4
	Alcohol & Other Drugs	5	6	3	7	0
	TOTAL DC METRO	**59**	**54**	**54**	**54**	**48**
Eastern Shore	Narcotics	11	7	9	10	10
	Cocaine	2	0	1	4	2
	Alcohol	2	2	1	2	0
	Methadone	0	0	0	1	2
	Alcohol & Cocaine	0	0	1	2	1
	Alcohol & Narcotics	0	2	3	4	4
	Narcotics & Cocaine	7	0	0	1	0
	Alcohol & Other Drugs	1	0	0	2	1
	TOTAL EASTERN SHORE	**23**	**11**	**15**	**26**	**20**
Southern Maryland	Narcotics	2	1	1	3	6
	Cocaine	1	0	0	1	0
	Alcohol	0	1	0	1	1
	Methadone	0	0	0	1	0
	Alcohol & Cocaine	0	0	0	1	0
	Alcohol & Narcotics	2	1	1	1	1
	Narcotics & Cocaine	0	2	0	1	0
	Alcohol & Other Drugs	0	0	0	1	1
	TOTAL SOUTHERN MARYLAND	**5**	**5**	**2**	**10**	**9**
Western Maryland	Narcotics	7	9	9	10	20
	Cocaine	0	0	0	0	6
	Alcohol	0	1	0	0	2
	Methadone	0	0	0	2	1
	Alcohol & Cocaine	0	0	0	0	1
	Alcohol & Narcotics	1	2	0	3	2
	Narcotics & Cocaine	0	1	1	1	2
	Alcohol & Other Drugs	0	0	3	0	2
	TOTAL WESTERN MARYLAND	**8**	**13**	**13**	**16**	**36**
	GRAND TOTAL (STATEWIDE)	**482**	**490**	**554**	**566**	**559**

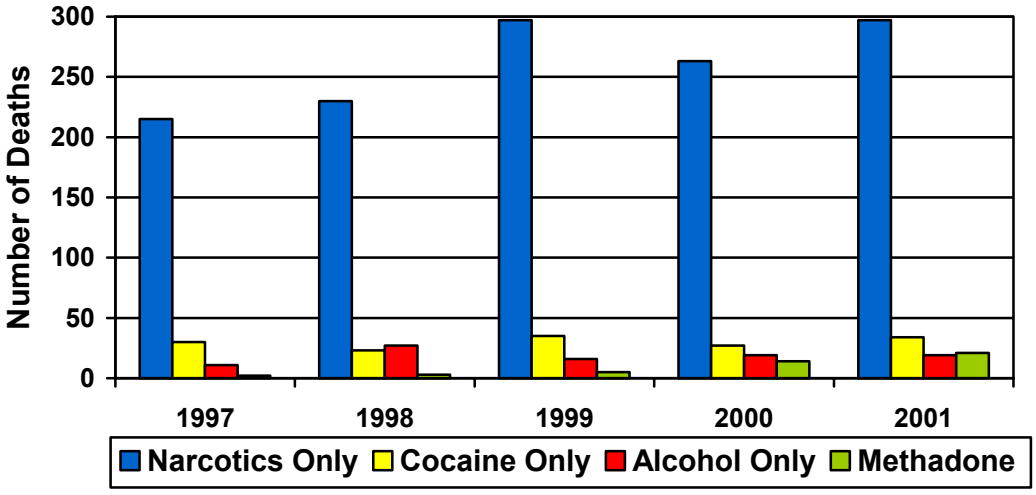
*Definition of regions can be found on page 16 of this report.

Source: Adapted by the Center for Substance Abuse Research from data supplied by the Office of the Chief Medical Examiner.

Single Drug Mentions

Figure 2 presents the trends over time for each type of overdose death associated with a single drug mention. As stated earlier, narcotic-related deaths account for a large proportion of overdose deaths. Comparatively few deaths occurred, however, that were associated with alcohol or cocaine-only. In 2001, there were 19 alcohol-only and 34 cocaine-only overdose deaths in Maryland. There was also an increase in the number of methadone-related deaths; In 1997, there were two overdose deaths associated with methadone. In 2001, there were 21. The largest increase of methadone-related overdoses appeared between 1999 and 2000.

FIGURE 2. ANNUAL NUMBER OF OVERDOSE DEATHS ASSOCIATED WITH A SINGLE DRUG MENTION



Source: Adapted by the Center for Substance Abuse Research from data supplied by the Office of the Chief Medical Examiner.

Narcotics Overdose Deaths

Overdose deaths from narcotics-only (shown in blue in Figure 2) have increased 38% since 1997 (from 215 in 1997 to 297 in 2001), but increases have not occurred across all demographic groups evenly. In 1997, narcotics-only overdose deaths occurred more frequently among males (88%) than females (12%), even though the proportion of narcotics-only overdoses among females increased from 1997 to 2001. In 1997, 26 females accounted for 12% of all narcotic overdose deaths. By 2001, this number increased to 67 (23% of the total), which represents a 158% increase in narcotics-only overdoses among females (Table A2, Appendix).

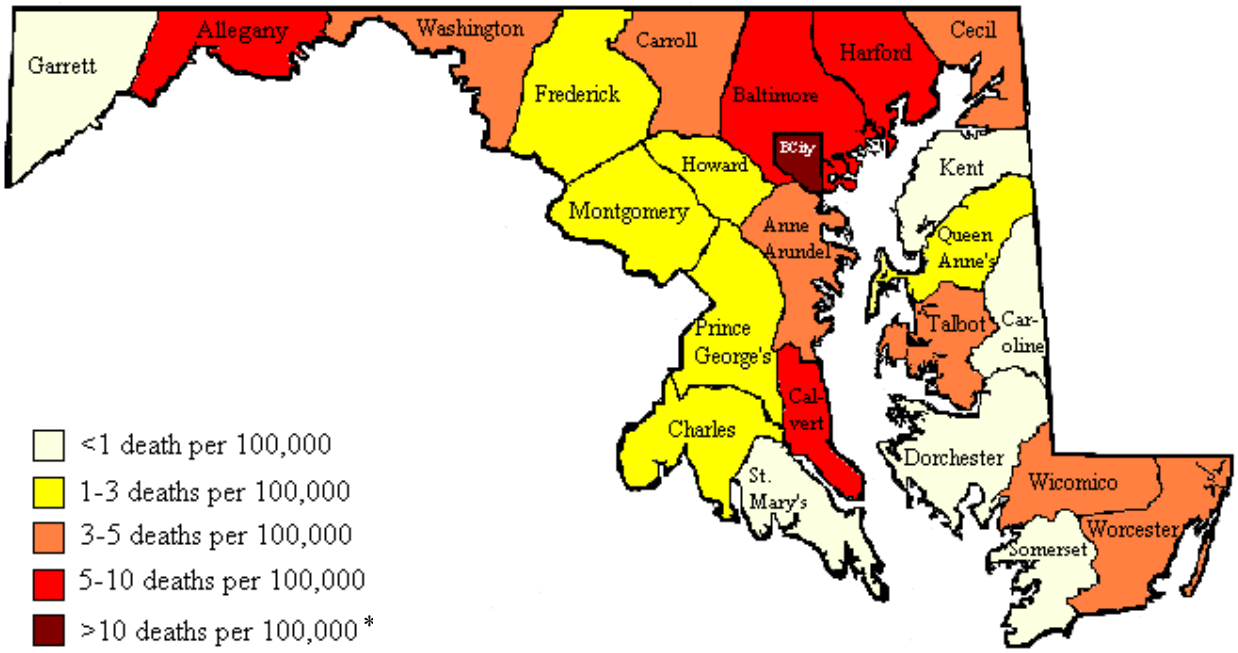
From 1997 to 1998, half of the narcotics-only overdose deaths occurred among blacks. In 1999, the proportion of overdose deaths among whites slightly exceeded the proportion among blacks (52% vs. 47%). This distribution continued in 2000 and 2001. Since 1997, narcotics-only overdoses among whites increased 51%, from 104 cases in 1997 to 157 in 2001. Comparatively, narcotics-only overdose deaths among blacks increased 25% between 1997 and 2001. Very few narcotics-only overdose deaths occur among individuals of a racial/ethnic group other than black or white (data available by contacting CESAR). It is unclear whether this difference in the demographics of overdose cases is related to possibly shifting demographic patterns in Maryland.

With respect to age, very few changes were observed among narcotics-only overdose cases over time. In 1997, the mean age of overdose victims was 37.95. In 2001, the mean age was 38.80.

Regionally, there have been few changes in narcotics overdose deaths. Increases have been noted in Western and Southern Maryland, but these regions have a very small number of cases. Since 1997, the number of narcotics-only overdose deaths has tripled in Southern Maryland, from two deaths in 1997 to six in 2001. Similarly, Western Maryland had seven narcotics-only overdose deaths in 1997 and 20 in 2001. More substantial increases, however, have been noted in Baltimore City. This region increased 30% from 122 narcotics-only deaths in 1997 to 159 in 2001. Narcotics-only overdose deaths in Central Maryland also increased substantially from 43 cases in 1997 to 77 in 2001. Narcotics-only mortality rates in 2001 by county are depicted in Figure 3.

Since 1997, narcotics-only overdoses among whites increased 51%, from 104 cases in 1997 to 157 in 2001. Comparatively, narcotics-only overdose deaths among blacks increased 25% between 1997 and 2001.

Figure 3. Narcotics-Only Overdose Death Rates per 100,000 Population, 2001



*Baltimore City=24.4 narcotics-only overdose deaths per 100,000 population
Source: Adapted by the Center for Substance Abuse Research from data supplied by the Office of the Chief Medical Examiner.

Methadone-related Overdose Deaths

Methadone, a synthetic opiate, is used to treat heroin dependence. As seen in Table 1, there have been increases in overdose deaths associated with methadone. In 2001, 21 individuals died from methadone overdoses, compared with two deaths in 1997. Male overdoses increased from 1 case in 1997 to 13 in 2001, while female cases have risen from 1 case in 1997 to 8 in 2001 (Table A2). Methadone overdose deaths occured primarily among older individuals living in Baltimore City and Central Maryland (data not shown in table; available by contacting CESAR).

It is unclear at this point what might underlie this increase in methadone overdoses. There is not enough information available to determine whether or not these deaths are occurring among individuals with prescriptions for methadone. Moreover, this problem is not limited to Maryland. Recent mortality data from SAMHSA's Drug Abuse Warning Network shows similar increases occurring in major cities around the nation. "Methadone ranked in the top 10 [drugs involved in deaths] in 19 cities, including New York (146 mentions), Phoenix (47), and Chicago (46)"[8]. In recent years, numerous articles have examined methadone overdoses in Switzerland, Australia, England, and Wales. It is unclear whether these increases are related to treatment protocols that prescribe take home doses of methadone. In June 2002, the use of take-home dosing in Maine was restricted after an increase in methadone overdoses. State

[8] Substance Abuse and Mental Health Services Administration, Office of Applied Studies. Mortality Data from the Drug Abuse Warning Network, 2000. DAWN Series D-19, DHHS Publication No. (SMA) 02-3633. Rockville, MD, 2002.

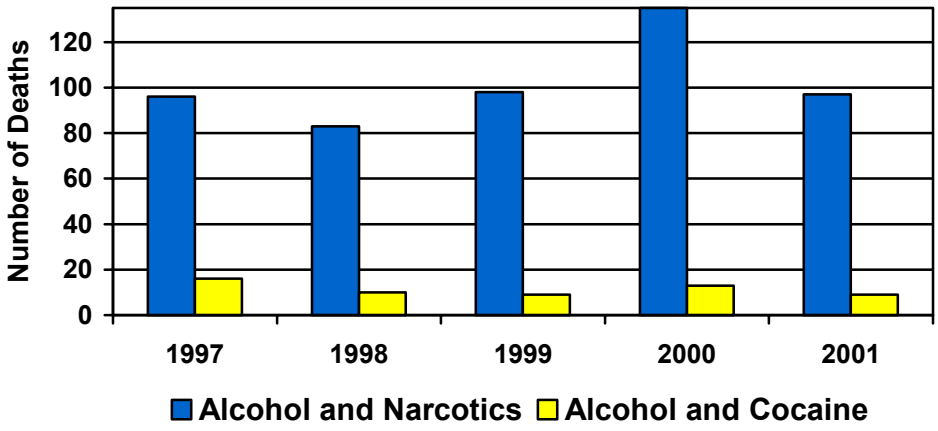
officials in Maine subsequently completed an investigation into the prescription practices at clinics and found all clinics in compliance with state regulations[9].

Multiple Drug Mentions

Alcohol in Combination with Other Drugs

The number of overdose deaths associated with alcohol in combination with other drugs has been relatively stable over the five-year time period. Alcohol in combination with narcotics deaths remained unchanged between 1997 and 2001 (101 deaths on average), with the exception of a spike in 2000 when 135 individuals died. Alcohol in combination with cocaine overdose deaths decreased in the last five years. In 1997, there were 16 overdose deaths attributed to alcohol and cocaine. In 2001, there were nine.

FIGURE 4. ANNUAL NUMBER OF OVERDOSE DEATHS ASSOCIATED WITH ALCOHOL IN COMBINATION WITH NARCOTICS OR COCAINE



Source: Adapted by the Center for Substance Abuse Research from data supplied by the Office of the Chief Medical Examiner.

The majority of overdose deaths attributed to alcohol in combination (narcotics and alcohol; cocaine and alcohol) occurred among males (86% in 2001). Nearly half (49%) of the deaths were among blacks, and the average age in 2001 was 42. While most overdoses attributed to alcohol in combination occur in Baltimore City, in 2001, every region in Maryland had at least one such overdose.

While most overdoses attributed to alcohol in combination occur in Baltimore City, in 2001, every region in Maryland had at least one such overdose.

[9] M. Shanahan, *Portland Press Herald*, 6/6/02.

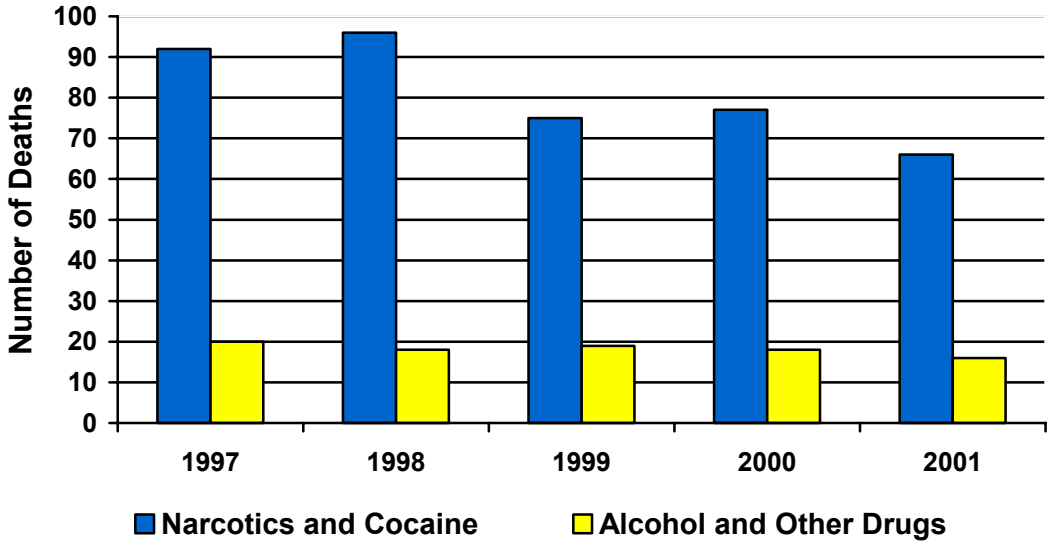
Narcotics and Cocaine

Overdose deaths associated with narcotics and cocaine decreased by almost 30% (from 92 cases in 1997 to 66 in 2001), but the decrease was solely among males. Female overdoses attributed to narcotics and cocaine have increased slightly in this same time period (from 11 in 1997 to 15 in 2001) (Table A2, Appendix).

The decline can also be attributed to a decrease among blacks (from 57 in 1997 to 33 in 2001). Overdoses among whites have declined only slightly in this same time period (from 35 in 1997 to 33 in 2001). The majority of these cases occurred in Baltimore City and Central Maryland, even though Baltimore City overdose deaths attributed to narcotics and cocaine have declined in the last four years (data not shown; available by contacting CESAR).

Similarly, overdose deaths attributable to the combination of alcohol and other drugs have decreased slightly (20% from 20 cases in 1997 to 16 in 2001). The decrease was solely among females (from 6 in 1997 to 2 in 2001). No change occurred in the number of deaths among blacks, while deaths among whites decreased by 4. The decreases occured primarily in Baltimore City and the DC metro area (Table A2, Appendix).

FIGURE 5. ANNUAL NUMBER OF OVERDOSE DEATHS ASSOCIATED WITH NARCOTICS AND COCAINE, OR ALCOHOL AND OTHER DRUGS



Source: Adapted by the Center for Substance Abuse Research from data supplied by the Office of the Chief Medical Examiner.

Appendix

Appendix

Definitions

Several terms used throughout this report are defined below:

Overdose Death: This term describes a death directly resulting from the ingestion of toxic amounts of alcohol, narcotics, cocaine, methadone, other drugs, or any of these drugs in combination, into the system of an individual, regardless of whether the cause of death is suicide, accident, or undetermined.

Single Drug Mention: This denotes cases where only a single drug (*e.g.,* alcohol, narcotic, cocaine, or other) is mentioned on the death certificate as the cause of death.

Multiple Drug Mention: This denotes cases where more than one drug (*e.g.,* alcohol, narcotic, cocaine, or other) is mentioned on the death certificate as the cause of death.

Percent Change: Percent change is a standard measure, derived from the following formula, by which a change over time is calculated.

$$\frac{(Year2\#-Year1\#)}{Year1\#}\times 100\%$$

In some cases, where the value for the base year is equal to zero, a percent change cannot be calculated. In this report, percent changes are calculated over the five-year period from 1997 to 2001.

Throughout this report, we refer to changes over time in overdose deaths, or the difference in the proportion of deaths between one group and another. These percentages are derived from all overdose deaths in Maryland (a "census"), rather than a sample of, say, hospital room deaths in Maryland. Therefore, because we are dealing with an entire population rather than a sample drawn from that population, statistical tests are unnecessary.

Region: This term denotes the location of the decedent's death, not necessarily the location of the decedent's residence. For the purposes of this report, we divided Maryland into six regions, following the classification used by Maryland's Alcohol and Drug Abuse Administration. Figure 6 below displays the location of the six regions:

Baltimore City:
Baltimore City

Central Maryland:
Anne Arundel, Baltimore, Harford, and Howard counties.

DC Metro:
Montgomery and Prince George's counties.

Eastern Shore:
Caroline, Cecil, Dorchester, Kent, Queen Anne's, Somerset, Talbot, Wicomico, and Worcester counties.

Southern Maryland:
Calvert, Charles, and St. Mary's counties.

Western Maryland:
Allegany, Carroll, Frederick, Garrett, and Washington counties.

FIGURE 6. MARYLAND REGIONS

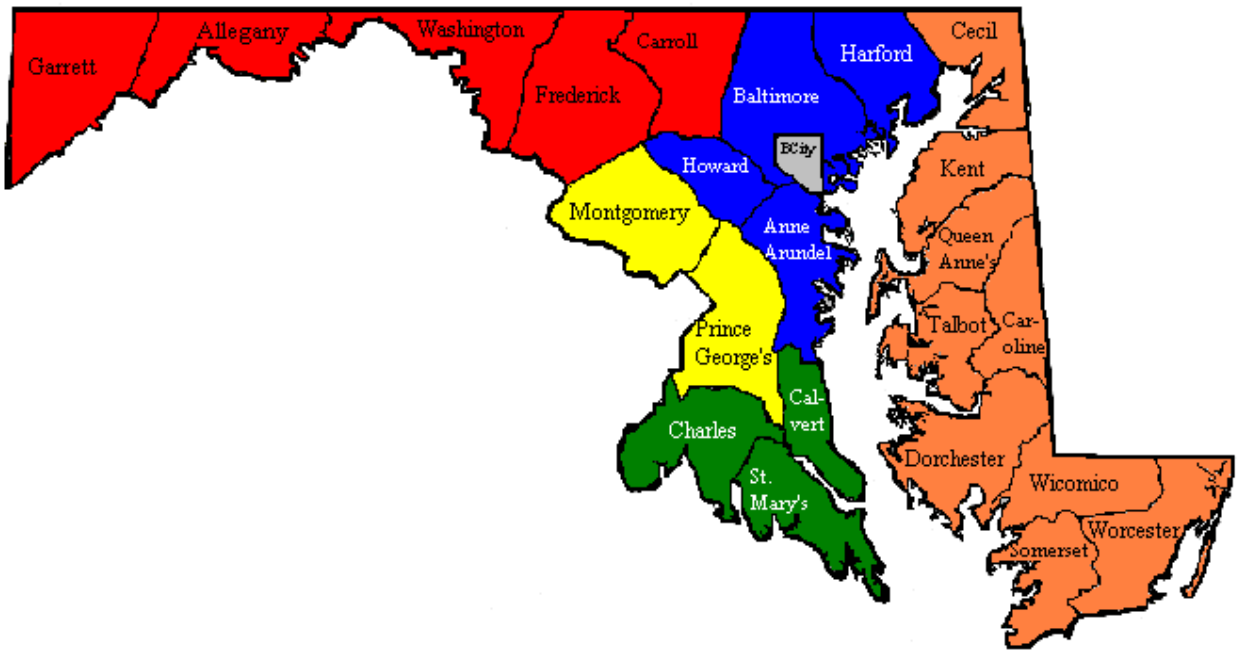


TABLE A1: ALL OVERDOSE DEATHS, BY COUNTY AND YEAR, 1997-2001

COUNTY	1997	1998	1999	2000	2001
Allegany	3	2	1	1	6
Anne Arundel	18	32	28	34	26
Baltimore City	292	308	343	334	306
Baltimore	60	48	79	75	82
Calvert	1	2	1	3	4
Caroline	0	0	1	0	0
Carroll	1	4	4	5	10
Cecil	11	4	5	7	4
Charles	3	1	1	3	4
Dorchester	1	1	2	5	1
Frederick	3	2	3	3	10
Garrett	0	1	0	1	0
Harford	7	11	14	8	21
Howard	10	8	6	9	11
Kent	1	1	0	0	0
Montgomery	21	14	21	20	23
Prince George's	38	40	33	34	25
Queen Anne's	1	0	2	0	1
Somerset	0	1	0	2	0
St. Mary's	1	2	0	4	1
Talbot	1	2	1	3	2
Washington	1	4	5	6	10
Wicomico	3	0	3	5	5
Worcester	5	2	1	4	7
STATE TOTAL	**482**	**490**	**554**	**566**	**559**

Source: Adapted by the Center for Substance Abuse Research from data supplied by the Office of the Chief Medical Examiner.

TABLE A2: ANNUAL OVERDOSE DEATHS, BY REGION, GENDER, AND YEAR

Region	Gender	Drug or Drug Combination					
			1997	1998	1999	2000	2001
Baltimore City	*Male*	Narcotics	105	108	143	120	125
		Cocaine	9	10	14	8	8
		Alcohol	3	9	7	8	7
		Methadone	1	3	3	3	4
		Alcohol & Cocaine	9	6	5	6	2
		Alcohol & Narcotics	62	49	58	76	52
		Narcotics & Cocaine	53	58	37	41	33
		Alcohol & Other Drugs	8	3	6	0	5
	Female	Narcotics	17	34	35	37	34
		Cocaine	5	1	3	3	8
		Alcohol	1	2	1	1	1
		Methadone	0	0	0	2	6
		Alcohol & Cocaine	3	3	0	1	2
		Alcohol & Narcotics	8	5	11	18	7
		Narcotics & Cocaine	7	15	18	9	12
		Alcohol & Other Drugs	1	1	2	1	0
TOTAL BALTIMORE CITY			**292**	**308***	**343**	**334**	**306**
			1997	**1998**	**1999**	**2000**	**2001**
Central Maryland	*Male*	Narcotics	39	39	66	51	60
		Cocaine	8	8	8	3	4
		Alcohol	1	2	1	3	0
		Methadone	0	0	0	2	6
		Alcohol & Cocaine	1	1	2	1	1
		Alcohol & Narcotics	17	15	17	25	22
		Narcotics & Cocaine	14	12	15	14	13
		Alcohol & Other Drugs	4	5	3	6	6
	Female	Narcotics	4	6	10	13	17
		Cocaine	2	1	0	1	1
		Alcohol	0	1	1	0	2
		Methadone	1	0	0	1	0
		Alcohol & Cocaine	0	0	0	1	1
		Alcohol & Narcotics	2	3	0	2	4
		Narcotics & Cocaine	1	3	2	2	2
		Alcohol & Other Drugs	1	3	2	1	1
TOTAL CENTRAL MARYLAND			**95**	**99**	**127**	**126**	**140**

*This total includes one case in which gender was not recorded.

Source: Adapted by the Center for Substance Abuse Research from data supplied by the Office of the Chief Medical Examiner.

Region	Gender	Drug or Drug Combination					
			1997	1998	1999	2000	2001
DC Metro	*Male*	Narcotics	27	23	18	15	19
		Cocaine	3	0	5	4	5
		Alcohol	4	8	4	3	5
		Methadone	0	0	1	1	1
		Alcohol & Cocaine	2	0	1	0	1
		Alcohol & Narcotics	3	6	7	5	4
		Narcotics & Cocaine	8	5	1	6	3
		Alcohol & Other Drugs	2	5	1	4	0
	Female	Narcotics	3	2	6	4	6
		Cocaine	0	3	4	3	0
		Alcohol	0	1	1	1	1
		Methadone	0	0	1	1	1
		Alcohol & Cocaine	1	0	0	1	0
		Alcohol & Narcotics	1	0	1	1	1
		Narcotics & Cocaine	2	0	1	2	1
		Alcohol & Other Drugs	3	1	2	3	0
TOTAL DC METRO			**59**	**54**	**54**	**54**	**48**
			1997	**1998**	**1999**	**2000**	**2001**
Eastern Shore	*Male*	Narcotics	10	6	8	8	9
		Cocaine	2	0	0	3	2
		Alcohol	1	1	1	1	0
		Methadone	0	0	0	1	1
		Alcohol & Cocaine	0	0	1	2	1
		Alcohol & Narcotics	0	2	3	3	4
		Narcotics & Cocaine	6	0	0	1	0
		Alcohol & Other Drugs	0	0	0	1	1
	Female	Narcotics	1	1	1	2	1
		Cocaine	0	0	1	1	0
		Alcohol	1	1	0	1	0
		Methadone	0	0	0	0	1
		Alcohol & Cocaine	0	0	0	0	0
		Alcohol & Narcotics	0	0	0	1	0
		Narcotics & Cocaine	1	0	0	0	0
		Alcohol & Other Drugs	1	0	0	1	0
TOTAL EASTERN SHORE			**23**	**11**	**15**	**26**	**20**

Source: Adapted by the Center for Substance Abuse Research from data supplied by the Office of the Chief Medical Examiner.

Region	Gender	Drug or Drug Combination					
			1997	1998	1999	2000	2001
Southern Maryland	*Male*	Narcotics	2	1	1	3	3
		Cocaine	1	0	0	0	0
		Alcohol	0	1	0	1	1
		Methadone	0	0	0	1	0
		Alcohol & Cocaine	0	0	0	1	0
		Alcohol & Narcotics	2	1	1	1	1
		Narcotics & Cocaine	0	2	0	1	0
		Alcohol & Other Drugs	0	0	0	1	0
	Female	Narcotics	0	0	0	0	3
		Cocaine	0	0	0	1	0
		Alcohol	0	0	0	0	0
		Methadone	0	0	0	0	0
		Alcohol & Cocaine	0	0	0	0	0
		Alcohol & Narcotics	0	0	0	0	0
		Narcotics & Cocaine	0	0	0	0	0
		Alcohol & Other Drugs	0	0	0	0	1
TOTAL SOUTHERN MARYLAND			**5**	**5**	**2**	**10**	**9**
			1997	**1998**	**1999**	**2000**	**2001**
Western Maryland	*Male*	Narcotics	6	7	7	8	14
		Cocaine	0	0	0	0	6
		Alcohol	0	1	0	0	2
		Methadone	0	0	0	2	1
		Alcohol & Cocaine	0	0	0	0	1
		Alcohol & Narcotics	1	2	0	2	2
		Narcotics & Cocaine	0	1	1	1	2
		Alcohol & Other Drugs	0	0	0	0	2
	Female	Narcotics	1	2	2	2	6
		Cocaine	0	0	0	0	0
		Alcohol	0	0	0	0	0
		Methadone	0	0	0	0	0
		Alcohol & Cocaine	0	0	0	0	0
		Alcohol & Narcotics	0	0	0	1	0
		Narcotics & Cocaine	0	0	0	0	0
		Alcohol & Other Drugs	0	0	3	0	0
TOTAL WESTERN MARYLAND			**8**	**13**	**13**	**16**	**36**
GRAND TOTAL (STATEWIDE)			**482**	**490**	**554**	**566**	**559**

Source: Adapted by the Center for Substance Abuse research from data supplied by the Office of the Chief Medical Examiner.