

**INTOXICATION DEATHS ASSOCIATED WITH
DRUGS OF ABUSE OR ALCOHOL
BALTIMORE, MARYLAND**



QUARTERLY REPORT: FOURTH QUARTER, 2007

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HIGHLIGHTS

- There were 65 intoxication deaths associated with drugs of abuse or alcohol among Baltimore City residents in the fourth quarter of 2007, one fewer than in the same quarter in 2006.
- During the 2007 calendar year, there were 235 deaths from intoxication associated with drugs of abuse or alcohol among Baltimore residents and 281 deaths resulting from intoxication that occurred in Baltimore (regardless of residence). Compared to 2006, this represents a 5% decrease in resident deaths and a 3% drop in deaths from intoxication occurring in Baltimore.
- After increasing substantially in 2006, cocaine-associated intoxication deaths among residents decreased by 22% in 2007.
- Methadone-associated deaths among residents continued to increase in 2007, rising by 21% compared to 2006.
- As in past years, heroin remains the most common substance associated with intoxication deaths, with 54% of deaths among residents in 2007 associated with heroin.

GOAL

To characterize intoxication deaths associated with substance use in Baltimore in the last quarter of 2007 and in 2007 as a whole, as a follow-up to our January 2008 report “Intoxication Deaths Associated with Drugs of Abuse or Alcohol, Baltimore, Maryland, January 1995 through September 2007.”

METHODOLOGY

The methodology used was identical to that used in our previous report. Briefly, we used records from the Maryland Office of the Chief Medical Examiner (OCME). Intoxication deaths were deaths where the OCME-determined cause of death included the word “intoxication” and the manner of death was categorized by the OCME as accidental or undetermined.

Intoxication deaths were classified according to which substances were associated with the death. An intoxication death was considered to be associated with a given *drug of abuse* if either of two criteria were met: (1) the drug was mentioned in the OCME-determined cause of death, or (2) the OCME-determined cause of death used non-specific terms such as “drug intoxication” or “narcotic intoxication” and the toxicological analysis indicated the presence of the drug. Drugs of abuse considered in this analysis include opioids (heroin, methadone, fentanyl, etc.), cocaine, benzodiazepines, and amphetamines among others. For a complete list, please refer to our previous report.

Alcohol-associated intoxication deaths were defined as deaths where “alcohol” or “ethanol” was mentioned in the OCME-determined cause of death.

Substance-specific categories were not mutually exclusive: a death identified as associated with a given substance could have been associated with other substances as well.

As in our previous report, we present results both for deaths among Baltimore City residents and for deaths resulting from intoxications that occurred in Baltimore regardless of residence.

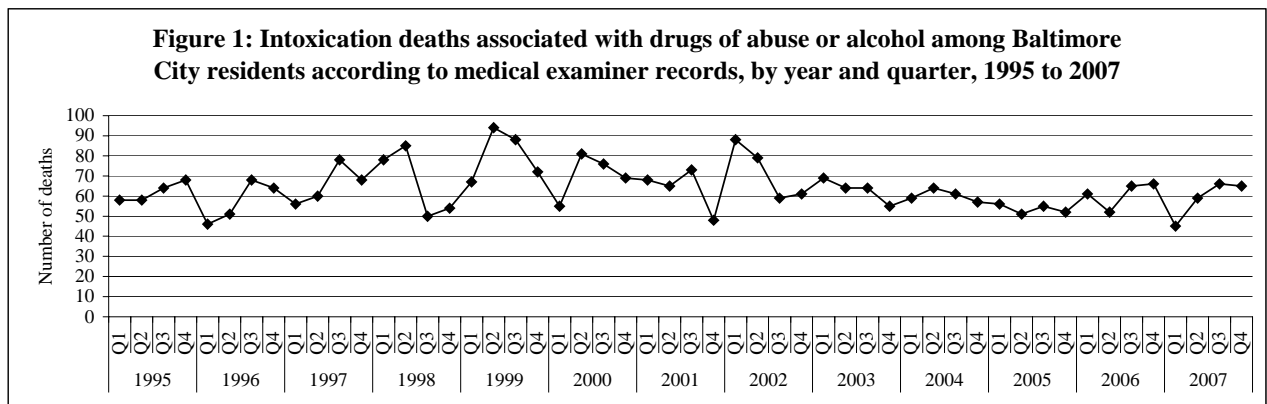
Further details about our methodology can be found at http://baltimorehealth.org/info/2008_01_24.IntoxicationDeaths.pdf.

RESULTS

Deaths among Baltimore City residents

- ❖ *Resident deaths in the fourth quarter of 2007 decreased compared to the same quarter in 2006*

There were 65 intoxication deaths associated with drugs of abuse or alcohol among Baltimore City residents in the fourth quarter of 2007. This represented one fewer deaths compared to the same quarter in 2006. Figure 1 displays deaths by quarter from 1995 to 2007.



- ❖ *Resident deaths in calendar year 2007 decreased compared to 2006*

There were 235 intoxication deaths associated with drugs of abuse or alcohol among Baltimore City residents for the 2007 calendar year, a decrease of 11 deaths (5%) compared to 2006 (Table 1).

Both drug of abuse- and alcohol-associated deaths decreased in 2007 compared to 2006. However, the decrease was more pronounced for deaths associated with alcohol, which dropped by 22%, than for deaths associated with drugs of abuse, which only decreased by 3%.

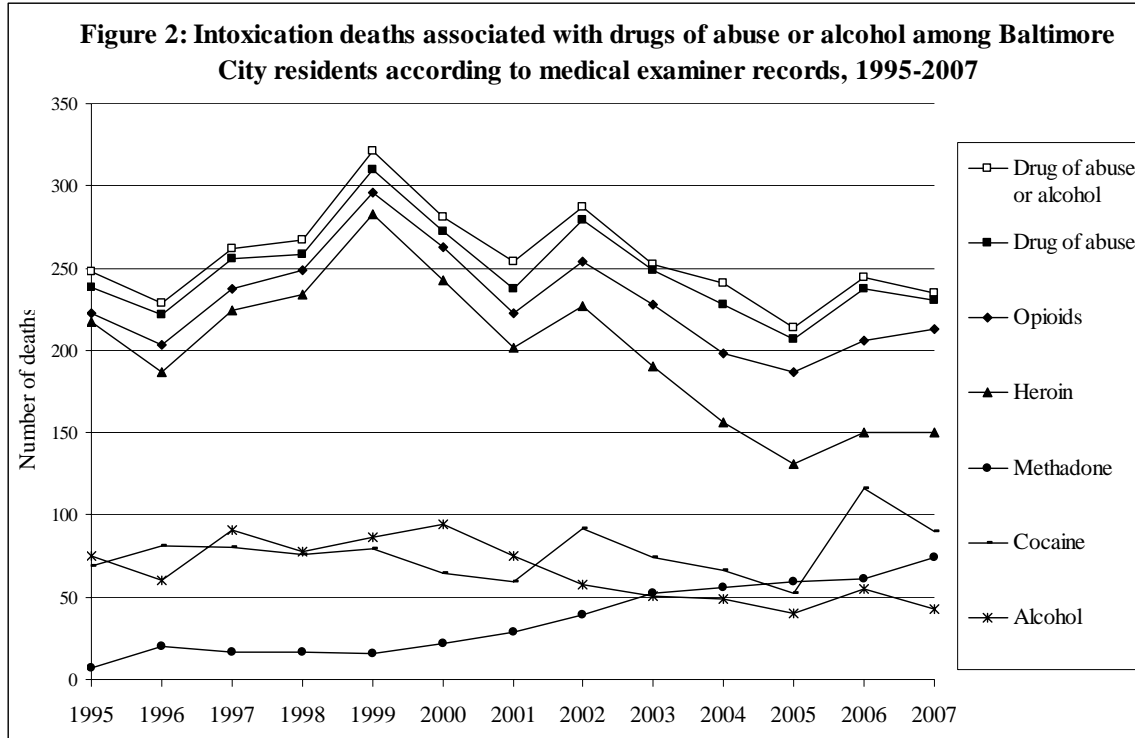
Among drugs of abuse-associated intoxication deaths, substantial decreases were observed for cocaine-associated deaths (-22%) and for fentanyl-associated deaths (-70%).

In contrast, methadone-associated deaths increased 20% from 61 in 2006 to 74 in 2007, while deaths associated with heroin remained constant. The increase in methadone-associated deaths extends the continuous increase seen in these types of deaths since 2000 (Figure 2). Methadone-associated deaths went from 5% of all deaths associated with drugs of abuse or alcohol in 1999 to 31% in 2007. Despite this increase, heroin remains the most common substance associated with intoxication deaths, with 64% of deaths among residents in 2007 associated with heroin.

Table 1: Intoxication deaths associated with drugs of abuse or alcohol among Baltimore City residents according to medical examiner records, 1995-2007

Intoxication death involves¹	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Alcohol or at least one drug of abuse	248	229	262	267	321	281	254	287	252	241	214	244	235
At least one drug of abuse	238	222	256	258	310	272	237	279	249	228	207	237	230
Opioids	223	203	237	249	296	263	223	254	228	198	187	206	213
W/ cocaine	57	62	64	68	65	56	46	67	56	38	32	86	74
W/ alcohol	59	50	81	66	75	83	57	49	44	32	33	39	36
Alone ²	120	104	114	131	165	138	130	148	139	133	121	93	112
Heroin	217	187	224	234	283	243	202	227	190	156	131	150	150
W/ cocaine ³	57	59	63	64	60	50	44	63	51	32	24	67	58
W/ alcohol ³	56	47	79	64	75	80	55	48	37	27	26	31	27
Alone ^{2,3}	111	87	99	120	150	120	104	111	97	86	67	53	59
Methadone	7	20	17	17	16	22	29	39	52	56	59	61	74
W/ heroin ³	5	9	8	11	10	10	15	18	22	21	16	20	20
W/ cocaine	0	1	3	7	3	6	3	6	9	10	6	27	17
W/ alcohol	2	3	2	2	0	4	4	1	5	8	4	3	7
Alone ^{2,3}	0	8	7	4	4	6	12	18	23	23	28	19	35
Fentanyl	0	0	0	0	1	1	0	1	3	2	3	10	3
Cod/Oxy/Hyd	1	1	3	4	2	5	5	2	5	2	11	8	9
Cocaine	69	81	80	76	79	65	59	92	74	66	52	116	90
W/ alcohol	18	18	25	21	11	16	13	11	14	8	3	22	11
Alone ²	8	16	13	5	14	7	12	24	16	25	20	22	15
Benzodiazepines	2	3	2	4	1	2	3	0	2	1	2	2	5
Alcohol	75	60	91	78	86	94	75	58	51	49	40	55	43
Alone ²	10	7	6	9	11	9	17	8	3	13	7	7	5

Cod/Oxy/Hyd: Codeine, Oxycodone, or Hydrocodone. ¹ Substance-specific categories are not mutually exclusive. ² Alone means that neither alcohol nor any other drug of abuse was involved in the death. ³ Numbers in these categories differ slightly from those published in our previous report because of a data error in our previous analyses.



❖ *Rates of death among residents*

Rates of death from intoxication associated with drugs of abuse or alcohol among residents decreased slightly in 2007 compared to the previous year.

Table 2: Crude rates* of drug of abuse- or alcohol-associated intoxication death among Baltimore City residents (per 100,000), by substances associated with the death, according to medical examiner records, 1995-2006

Substance involved [^]	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	1995 - 2007 Average
Drug of abuse or alcohol	35.3	33.3	38.4	40.0	48.8	43.0	39.4	44.9	38.1	37.2	33.4	37.9	36.9	39.0
Drug of abuse	33.9	32.2	37.5	38.7	47.2	41.6	36.7	43.7	37.8	35.2	32.3	36.8	36.1	37.7
Opioid	31.8	29.5	34.7	37.3	45.0	40.2	34.6	39.7	34.5	30.5	29.2	32.0	33.4	34.8
Heroin	30.9	27.2	32.8	35.1	43.0	37.2	31.3	35.5	28.6	24.0	20.5	23.2	23.7	30.2
Methadone	1.0	2.9	2.5	2.5	2.4	3.4	4.5	6.1	8.1	8.7	9.2	9.5	11.6	5.6
Cocaine	9.8	11.8	11.5	11.4	12.0	10.0	9.1	14.4	11.2	10.3	8.1	18.1	14.1	11.7
Alcohol	10.7	8.7	13.4	11.7	13.1	14.4	11.6	9.1	7.6	7.5	6.2	8.6	6.7	10.0

* Population denominators are intercensal population estimates for 1995-1999, Census 2000 for 2000 and postcensal estimates for 2001-2007. Rates are not age adjusted.

[^] Substances are not mutually exclusive.

❖ *Demographic characteristics*

From 2003 to 2007¹, 69% of deaths associated with drugs of abuse or alcohol were among males and 65% were among African Americans (Table 2). In that time period, decedents were on average 44 years old at the time of death, although age at death ranged from 14 to 76. From 2003 to 2007, only one death occurred among those less than 18 years of age. Demographic characteristics did not differ over time between 2003 and 2007.

Demographics differed according to the substances associated with each death (Table 2). Deaths associated with heroin, cocaine, methadone or alcohol were most likely to occur among males and African Americans. Fentanyl-associated deaths were predominantly among males and nearly equally distributed among whites and blacks. Deaths associated with codeine, hydrocodone, oxycodone, barbiturates and especially benzodiazepines were more likely than other deaths to occur among females and whites.

Table 3: Sex, race, and age of Baltimore residents dying from intoxication associated with drugs of abuse or alcohol from 2003 to 2007 according to medical examiner records, by substances associated with the death

Substance ¹	N	Sex		Race			Age			
		Male %	Female %	African American %	White %	Other %	Mean	Sd	Min	Max
Any substance	1,151	69.2	30.8	65.3	33.8	0.9	44	9.2	14.1	76.7
Heroin	778	72	28	67.4	32	0.6	43.6	8.6	18.3	73.5
Methadone	302	60.3	39.7	63.6	35.4	1	44.3	10.2	14.1	76.7
Cocaine	398	68.1	31.9	68.6	29.9	1.5	43.5	8.7	19.5	73.2
Fentanyl	21	85.7	14.3	47.6	52.4	0	40.5	10.3	18.5	53.1
Codeine/Hydrocodone/Oxycodone	35	57.1	42.9	42.9	57.1	0	43.5	9.7	23.1	58.4
Barbiturate	2	50	50	50	50	0	39.9	10.5	32.5	47.3
Benzodiazepine	12	33.3	66.7	16.7	83.3	0	42.9	12.8	24.9	62.6
Alcohol	238	75.6	24.4	67.6	29.4	2.9	44.4	8.2	22.6	68.5

¹ Substance-specific categories are not mutually exclusive.

Deaths resulting from intoxications occurring in Baltimore

❖ *Deaths resulting from intoxications occurring in Baltimore exceed deaths among Baltimore residents*

In 2007, there were 281 deaths resulting from intoxications occurring in Baltimore and associated with drugs of abuse or alcohol, or 20% more than the 235 deaths among residents. Among those 281 deaths, 83% were among Baltimore City residents, while 10% were among non-residents, 3% were among homeless individuals and 5% had no recorded address. The non-residents came primarily from Baltimore County (2% of the 281 deaths), out of state (3%), from Anne Arundel (2%), and Harford, Howard, and Carroll counties (<1% each).

❖ *Trends in deaths resulting from intoxications occurring in Baltimore mirror those seen for deaths among Baltimore residents*

¹ Demographic data were only available for these years.

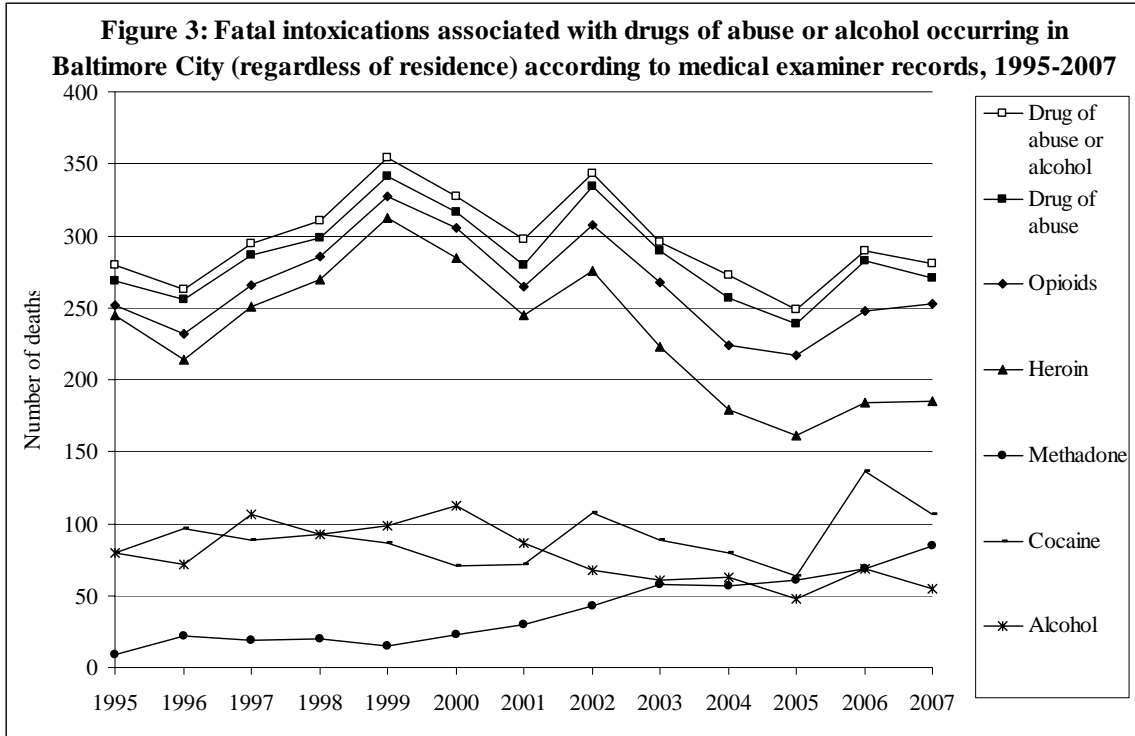
Deaths resulting from intoxications occurring in Baltimore decreased by 3% from 2006 to 2007, with alcohol-associated deaths decreasing 20% and deaths associated with drugs of abuse decreasing only 4%.

Cocaine-associated deaths and fentanyl-associated deaths decreased 22% and 75%, respectively, while methadone-associated deaths increased by 23%.

Table 4: Fatal intoxications associated with drugs of abuse or alcohol occurring in Baltimore City (regardless of residence) according to medical examiner records, 1995-2007

Intoxication death involves¹	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Alcohol or at least one drug of abuse	280	263	295	310	354	327	298	343	296	273	249	290	281
At least one drug of abuse	269	256	287	299	341	316	280	334	290	257	239	283	271
Opioids	252	232	266	286	327	305	265	307	268	224	217	248	253
W/ cocaine	66	75	71	81	73	60	59	81	69	49	42	102	89
W/ alcohol	63	61	93	79	86	99	68	58	52	43	37	52	43
Alone ²	136	112	126	149	183	159	152	179	161	140	138	110	130
Heroin	245	214	251	270	312	285	245	276	223	179	161	184	185
W/ cocaine ³	66	71	70	76	68	54	58	77	63	42	34	81	72
W/ alcohol ³	60	57	90	77	86	96	66	57	46	36	30	42	34
Alone ^{2,3}	125	95	110	137	165	141	125	136	111	94	83	62	71
Methadone	9	22	19	20	15	23	30	43	58	57	61	69	85
W/ heroin ³	6	9	9	12	10	11	16	20	23	23	17	22	25
W/ cocaine	0	2	4	8	3	6	3	5	9	13	6	29	21
W/ alcohol	2	4	3	2	0	4	4	2	5	8	4	3	8
Alone ^{2,3}	1	8	7	5	4	6	11	20	28	21	28	23	38
Fentanyl	0	0	0	0	1	1	0	1	3	2	3	12	3
Cod/Oxy/Hyd	1	2	3	4	2	5	6	3	6	4	12	12	10
Cocaine	80	97	89	93	87	71	72	107	89	80	64	136	106
W/ alcohol	19	23	28	28	16	17	18	12	17	12	5	27	13
Alone ²	9	19	14	9	14	9	12	25	18	28	21	25	16
Benzodiazepines	2	7	2	5	0	4	3	1	1	2	2	2	7
Alcohol	80	72	106	93	99	112	87	68	61	63	48	69	55
Alone ²	11	7	8	11	13	11	18	9	6	16	10	7	10

Cod/Oxy/Hyd: Codeine, Oxycodone, or Hydrocodone. ¹ Substance-specific categories are not mutually exclusive. ² Alone means that neither alcohol nor any other drug of abuse was involved in the death. ³ Numbers in these categories differ slightly from those published in our previous report because of a data error in our previous analyses.



CONCLUSIONS

Intoxication deaths associated with drugs of abuse or alcohol decreased slightly in 2007 compared to 2006. Importantly, the substantial increase in cocaine-associated deaths observed in 2006 did not persist in 2007. Instead, cocaine-associated deaths dropped by more than 20%. Likewise, after increasing in 2006, heroin-associated deaths stayed flat in 2007.

Deaths associated with methadone continued the steady increase that began in 2000. By 2007, almost a third of drugs of abuse or alcohol-associated intoxication deaths were associated with methadone and 15% were associated with methadone without alcohol or any other drug of abuse.

Death from intoxication associated with drugs of abuse or alcohol continues to be a significant public health problem in Baltimore.