

Montgomery County Poisoning Death Review: 2010 -2013

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The Poisoning Death Review (PDR) is conducted by the WSU Boonshoft School of Medicine Center for Interventions, Treatment & Addictions Research (CITAR), in collaboration with the Montgomery County Coroner's Office, under contract with Public Health - Dayton & Montgomery County. The PDR was part of the Preventing Unintentional Drug Poisoning Project, which was funded by Public Health – Dayton & Montgomery County and the Ohio Department of Health, with injury prevention block grant funds from the U.S. Centers for Disease Control.

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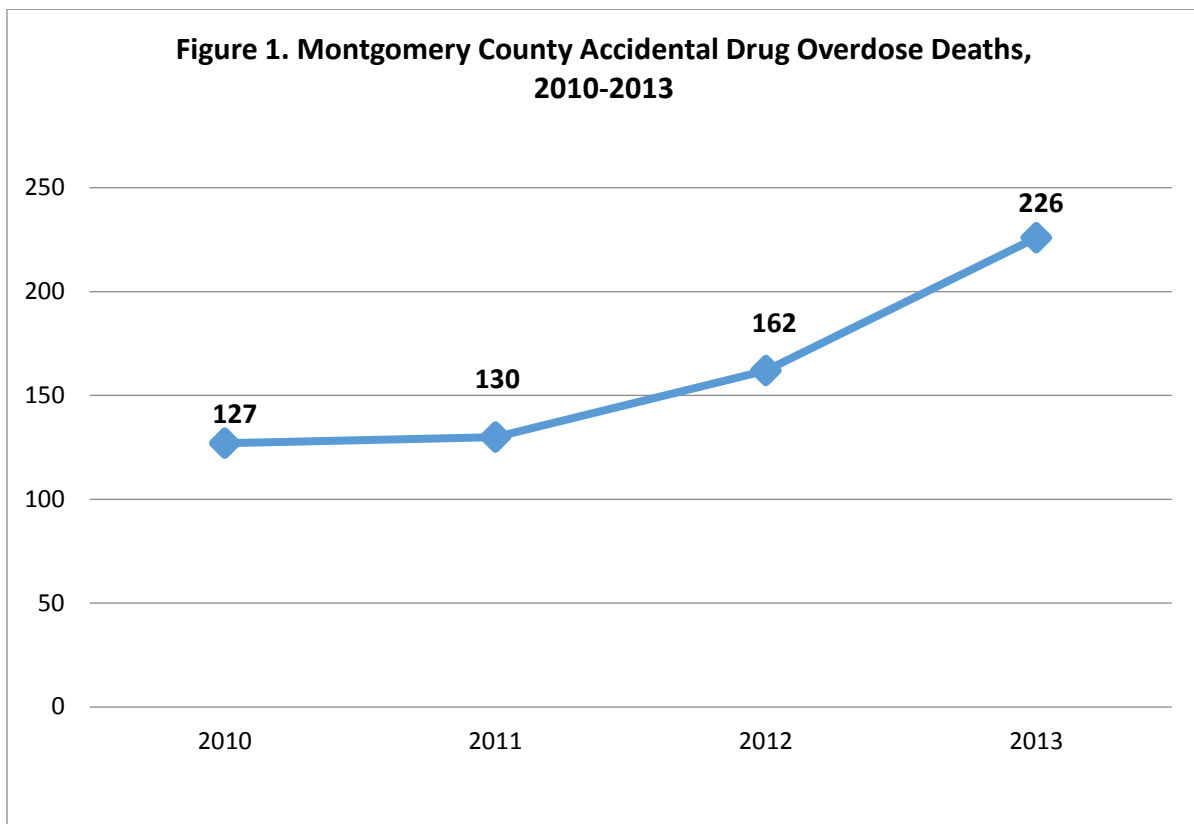
Montgomery County Poisoning Death Review: 2010 -- 2013

Summary

- There was a dramatic increase in the overall number of unintentional drug overdose deaths in Montgomery County, from 162 deaths in 2012 to 226 in 2013. Unintentional drug overdose deaths have increased continuously in Montgomery County since 2010, but the increase of 64 deaths from 2012 through 2013 is unprecedented.
- The increase of an additional 64 accidental drug overdose cases from 2012 through 2013 doubles the increase of 32 additional unintentional drug overdoses from 2011 to 2012.
- There was a significant increase in the number of deaths involving heroin, from 95 in 2012 to 132 in 2013. This continues a trend that began in late 2011 and is of great public health concern.
- The decline in benzodiazepine mentions in unintentional drug overdose deaths observed during the past two years shows signs of reversing. Benzodiazepine mentions decreased from 87 (69% of all overdose deaths) in 2010, to 84 (65%) in 2011, to 70 (43%) in 2012, and then increased to 118 (52%) in 2013.
- There was a substantial increase in mentions of fentanyl in 2013, from 9 in 2012 to 34 in 2013. Twenty of those mentions were related to clandestinely manufactured fentanyl (perhaps combined with heroin, and/or cocaine), rather than prescription forms of the drug. In this report we classify those 20 mentions as “illicit fentanyl,” an opioid, rather than a licit prescription form of fentanyl, such as a transdermal patch.
- The decline in prescription opioid mentions in unintentional drug overdoses observed during the past two years shows some signs of slowing. Prescription opioid mentions decreased from 94 (74% of all accidental drug overdose deaths) in 2010, to 81 (62%) in 2011, to 75 (46%) in 2012, and then increased to 100 (44%) in 2013. However, the percentage of prescription drug mentions in 2012 and 2013 remains fairly constant, around 45%.
- The prevalence of any opiate mentions (Heroin, Prescription Opioids, and/or Illicit Fentanyl) in accidental drug overdose deaths has hovered around 90% for the past 4 years, despite the increase in accidental drug overdose cases.
- The dramatic increases in unintentional drug overdoses in Montgomery County from 2012 through 2013 is an urgent public health problem that calls for collaborative intervention by the system of community partners.

Introduction

In 2013, 226 unintentional drug overdose deaths occurred in Montgomery County, Ohio. This is the highest number on record, surpassing the number of unintentional overdoses in 2012 by 64 deaths. This finding comes from the Poisoning Death Review (PDR), a process involving the compilation and interpretation of multiple data sets from the Montgomery County Coroner's Office. The PDR, funded by Public Health - Dayton & Montgomery County, is carried out by faculty and staff at the Wright State University Boonshoft School of Medicine in collaboration with the Montgomery County Coroner's Office. The designation of deaths being either unintentional (accident) or intentional (suicide) is made by the Montgomery County Coroner. This is the fourth year the PDR has been conducted. In 2012, 162 unintentional drug overdose deaths occurred in Montgomery County; in 2011, 130; and in 2010, 127 (see Figure 1). A numerical summary of the PDR data, including 2013 data and comparisons to 2010-2012, is attached to this narrative.



Demographic and Health Characteristics of Decedents

Of the 226 decedents, 197 (87%) were Montgomery County residents, and 22 were residents of other Ohio counties (4 Greene, 4 Miami, 3 Butler, 2 Clinton, 2 Darke, 2 Franklin, and 1 each from Highland, Logan, Mercer, Preble, and Warren). Six were out-of-state residents (California, Florida (2), Illinois, Indiana and Texas). One decedent had no fixed address.

As in previous years, a majority of the decedents were white (87%), male (67%), and had at least a high school education (71%).

The three age groups with the highest proportion of deaths were 35-44 year olds (28%), 45-54 year olds (27%), and 25-34 year olds (26%), together accounting for 81% of the 2013 decedents, nearly unchanged from 2012. However, there were noteworthy changes in the proportions among these groups: the 35-44 year-old group increased 9% from 2012, and the 45-54 year-old group decreased 6%.

Autopsy results revealed most decedents had a history of physical illness or disability (78%), with heart disease common (58%). The coroner investigator reports indicate a majority (78%) had a history of substance abuse. About one-fifth of decedents had a history of mental illness. Reports made by family, friends, or witnesses are the source of the documentation of a history of substance abuse or mental illness. There may be additional instances of substance abuse and mental illness that were not recorded.

As in previous years, most of the deaths (74%) occurred in the decedents' home or that of a friend or relative.

Drug Toxicology Data

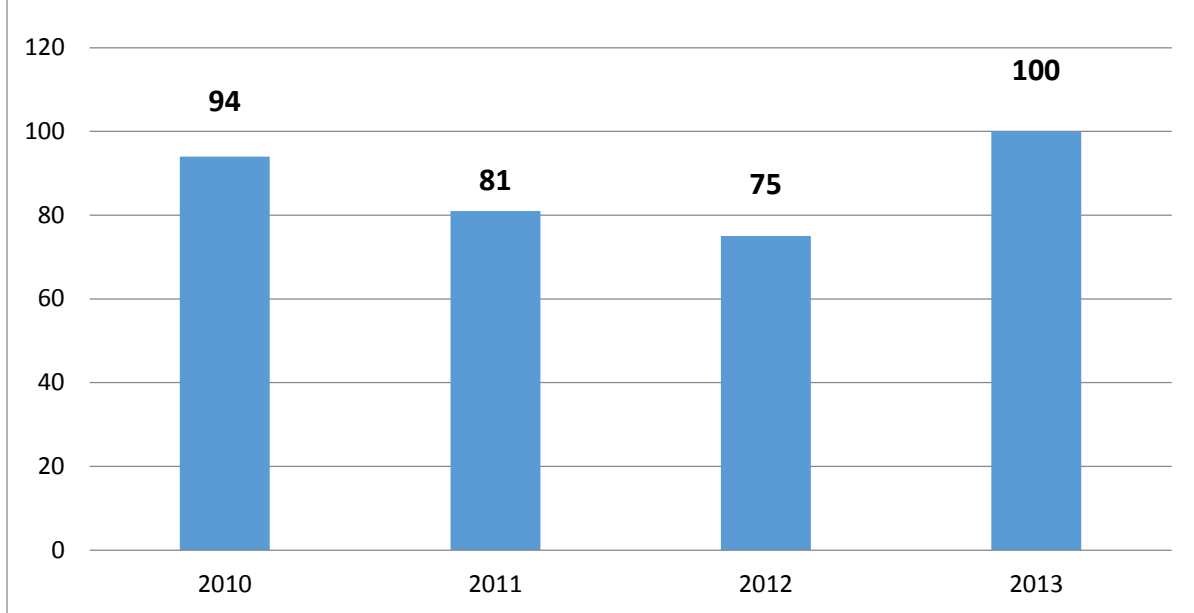
Definition of Drug "Mentions"

A drug "mention" means that a specific drug was found in a bodily system or fluid of a decedent, not that that drug was necessarily the sole cause of death. The presence of more than one drug can result in more than one mention from a single decedent.

Prescription Opioids

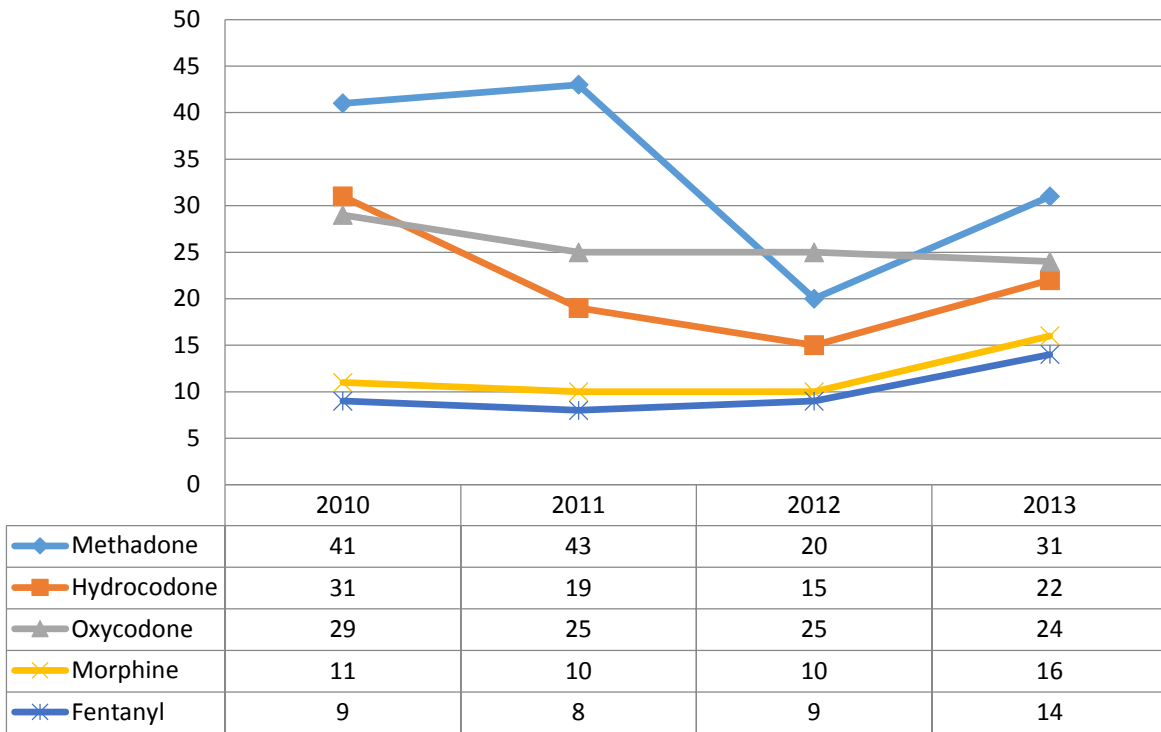
Prescription opioids (drugs such as hydrocodone, oxycodone, or methadone used to treat pain and/or "get high") continue to be a significant factor in unintentional drug overdose deaths. This class of drugs was mentioned in 100 cases in 2013, up from 75 cases in 2012 (see Figure 2). This is a significant increase of the actual number of prescription opioid mentions in 2013, even though the *percentage* of mentions in Montgomery County's overall accidental drug overdose deaths decreased slightly—from 46% in 2012 to 44% in 2013.

**Figure 2. Mentions of Prescription Opioids in Montgomery County
Accidental Overdose Deaths, 2010-2013**



Prescription opioids mentioned most frequently in 2013 toxicology reports were: methadone, 31 (14% of all overdose deaths); oxycodone, 24 (11%); hydrocodone, 22 (10%), morphine, 16 (7%), and fentanyl, 14 (6%). **We note that this report distinguishes fentanyl mentions resulting from prescription forms of the drug (discussed here), such as transdermal patches, versus illicit fentanyl made in clandestine labs (discussed below).** From 2010 through 2013, mentions of oxycodone remained fairly stable, ranging from 29 in 2010 to 24 in 2013 (see Figure 3). However, hydrocodone and methadone mentions showed significant decreases from 2011 to 2012, and then significant increases in 2013. (The methadone identified in toxicological analyses had almost certainly been prescribed for pain, *not* diverted from drug abuse treatment programs.) Morphine mentions were fairly stable from 2010 through 2012, and then also increased in 2013, while prescription fentanyl mentions rose from 9 cases in 2012 to 14 cases in 2013 (Figure 3).

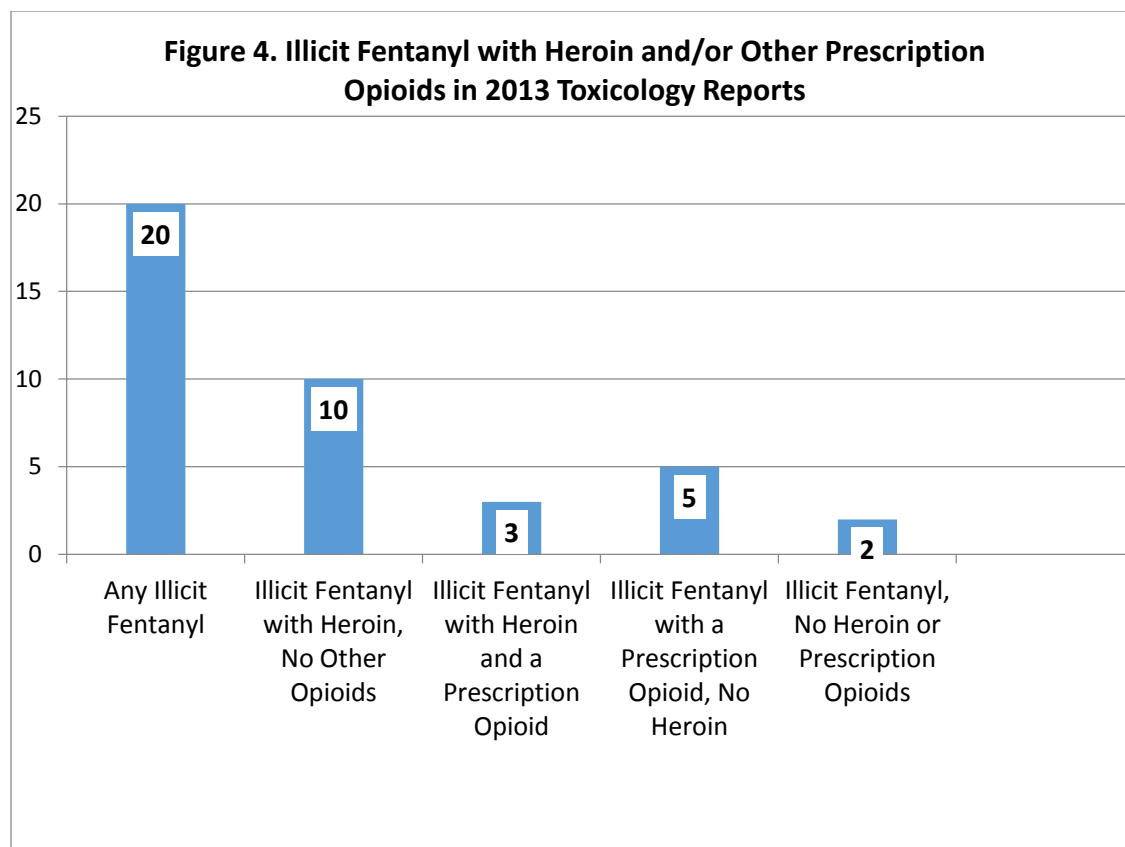
Figure 3. Mentions of Selected Prescription Opioids in Montgomery County Accidental Drug Overdose Deaths, 2010-2013



Illicit/Clandestinely Manufactured Fentanyl

The presence of illicit fentanyl was a significant element in the drug overdose picture in Montgomery County in 2013. There were 20 illicit fentanyl mentions in 2013, and all occurred during the last quarter. More than half of the illicit fentanyl mentions occurred in the presence of heroin.

As shown in Figure 4, only 2 of the 20 illicit fentanyl mentions were without heroin or any other opioid. There were a total of **13 mentions of illicit fentanyl when heroin was also present**—10 of illicit fentanyl with heroin alone, and 3 of illicit fentanyl, heroin and another prescription opioid. **Prescription fentanyl in combination with heroin has been quite rare—only 4 cases from 2010-2013.**



Benzodiazepines

In 2013, the number of mentions of benzodiazepines was up significantly, from 70 in 2012 to 118 in 2013, even though the percentage of benzodiazepine mentions in accidental drug overdose deaths was up only slightly, from 54% in 2012 to 59% in 2013. Figure 5 illustrates the trend of declining mentions of benzodiazepines in 2011 and 2012, followed by a significant increase in 2013.

While 2013 saw increases in mentions of all four of the most frequently occurring benzodiazepines, there were notable increases in mentions of alprazolam (from 40 in 2012 to 75 in 2013) and clonazepam (from 23 in 2012 to 46 in 2013). These increases are illustrated in Figure 6. Figure 7 shows the increases in prescription opioid and benzodiazepine mentions in 2013, almost paralleling each other.

There was also a significant increase in the number of mentions in which a prescription opioid and a benzodiazepine were present together (Figure 8). In 2012, there were 43 cases (27% of all accidental drug overdose deaths) involving both a prescription opioid and a benzodiazepine, compared to 72 cases (32%) in 2013. Prescription opioids and benzodiazepines are particularly dangerous in combination, because they increase the risk of respiratory depression.

**Figure 5. Mentions of Benzodiazepines in Montgomery County
Accidental Overdose Deaths,
2010-2013**

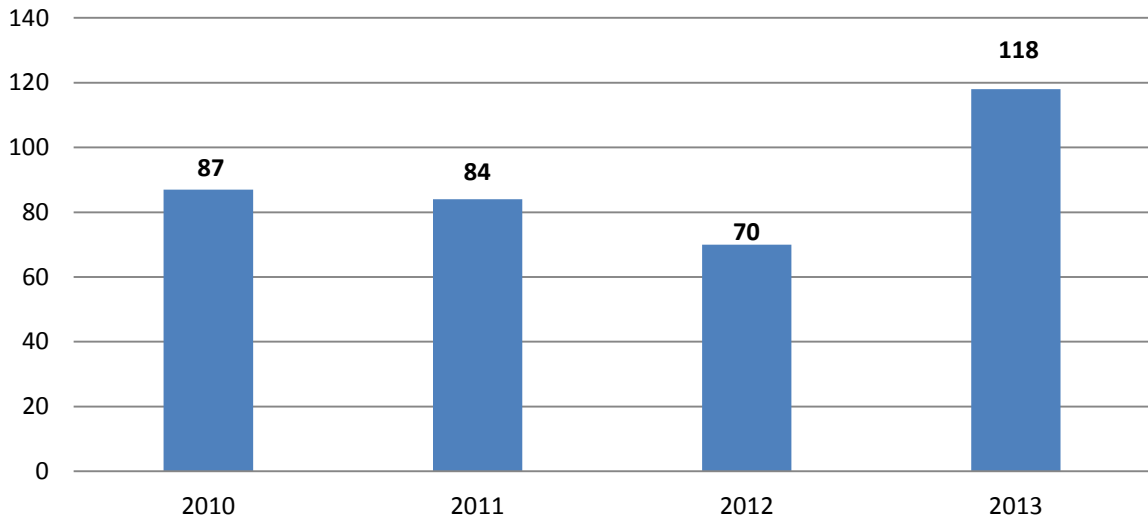


Figure 6. Most Frequently Mentioned Benzodiazepines in Montgomery County Accidental Drug Overdose Deaths, 2010-2013

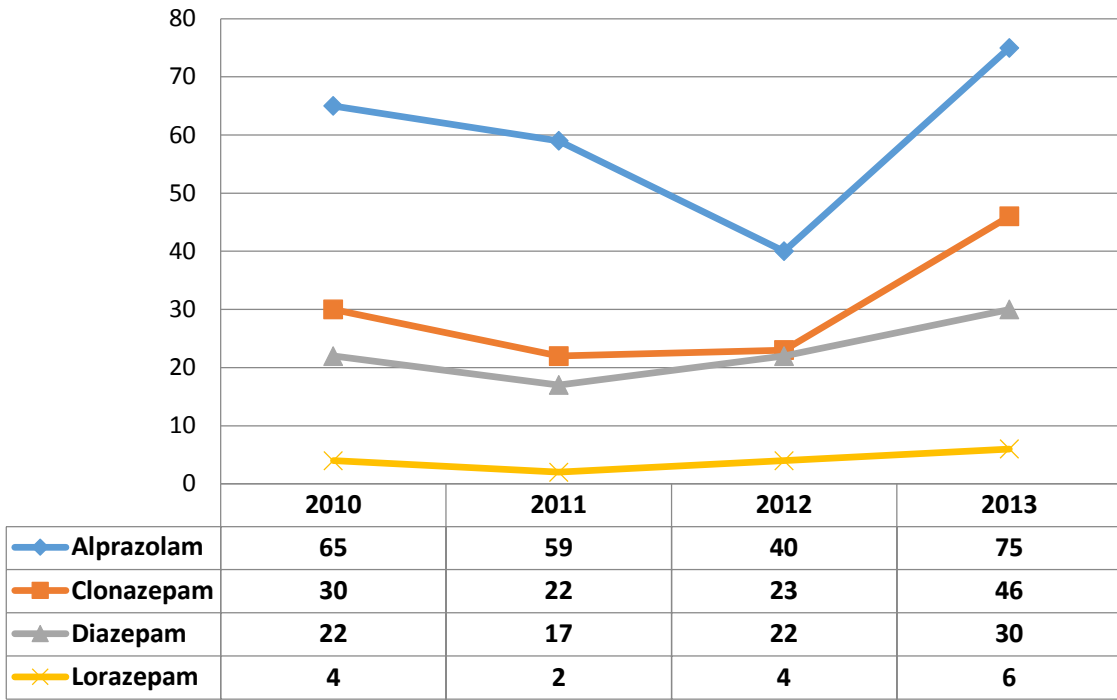


Figure 7. Total Mentions of Prescription Opioids and Benzodiazepines, 2010-2013

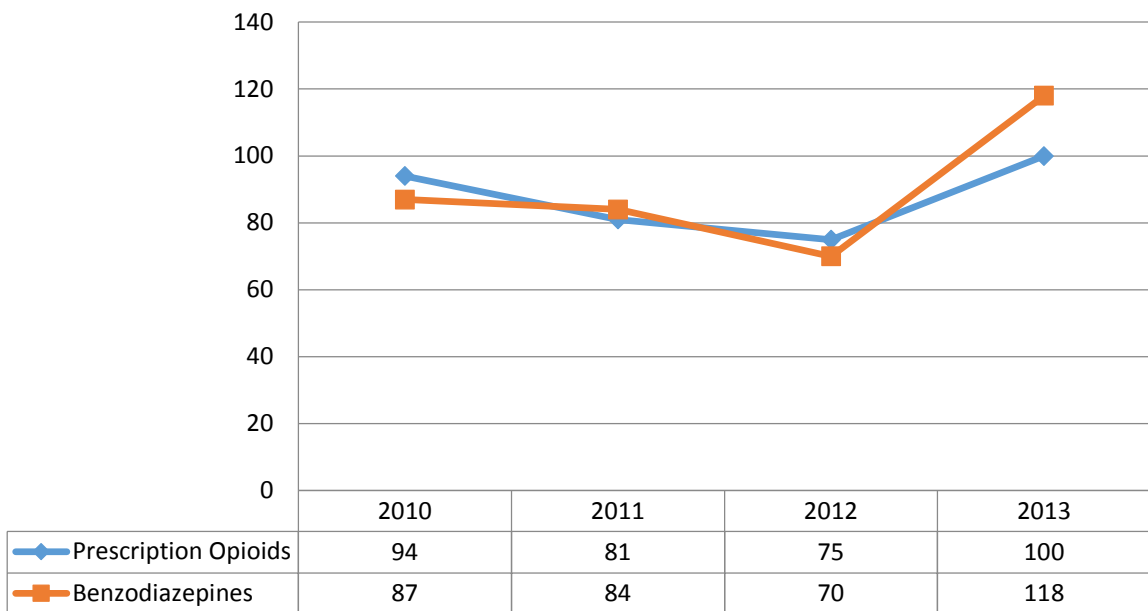
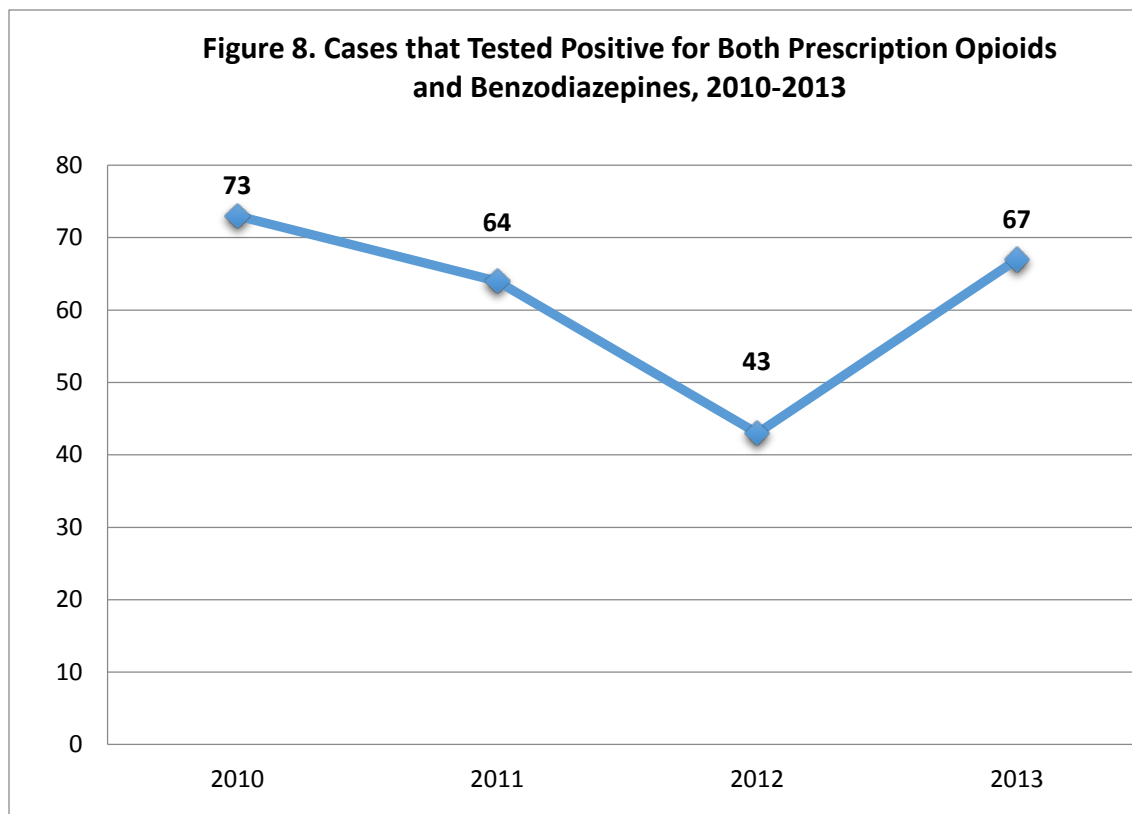


Figure 8. Cases that Tested Positive for Both Prescription Opioids and Benzodiazepines, 2010-2013



Heroin

Total mentions of heroin continued to increase dramatically in 2013. Heroin was present in 132 unintentional drug overdose cases in 2013, up from 95 in 2012 (see Figure 9). This increase of 37 heroin mentions from 2012 to 2013 continues the trend that began in 2012 when heroin mentions increased by 49 cases. Figure 10 shows the heroin trend line along with the mentions of benzodiazepines and prescription opioids in 2013. **Strikingly, the decline in prescription opioids and benzodiazepines in 2012 co-occurred with dramatic increases in heroin mentions.** Figure 11 shows the *percentage* mentions of heroin, along with percentage mentions of prescription opioids and benzodiazepines. Heroin was present in 58% of all cases in 2013. This is consistent with the percentage increase first seen in 2012, when heroin was mentioned in 59% of the cases—a large and significant increase from the first two years of the Poison Death Review, when heroin was found in the bodily systems or fluids of 31% (2010) and 35% (2011) of the decedents. The increase in heroin mentions was initially seen in the last quarter of 2011. In addition, 19% of all decedents with heroin mentions also had prescription opioids in their systems in 2013. This dangerous combination comprised 11% of all 2013 overdose death cases.

Figure 9. Mentions of Heroin in Montgomery County Accidental Overdose Deaths, 2010-2013

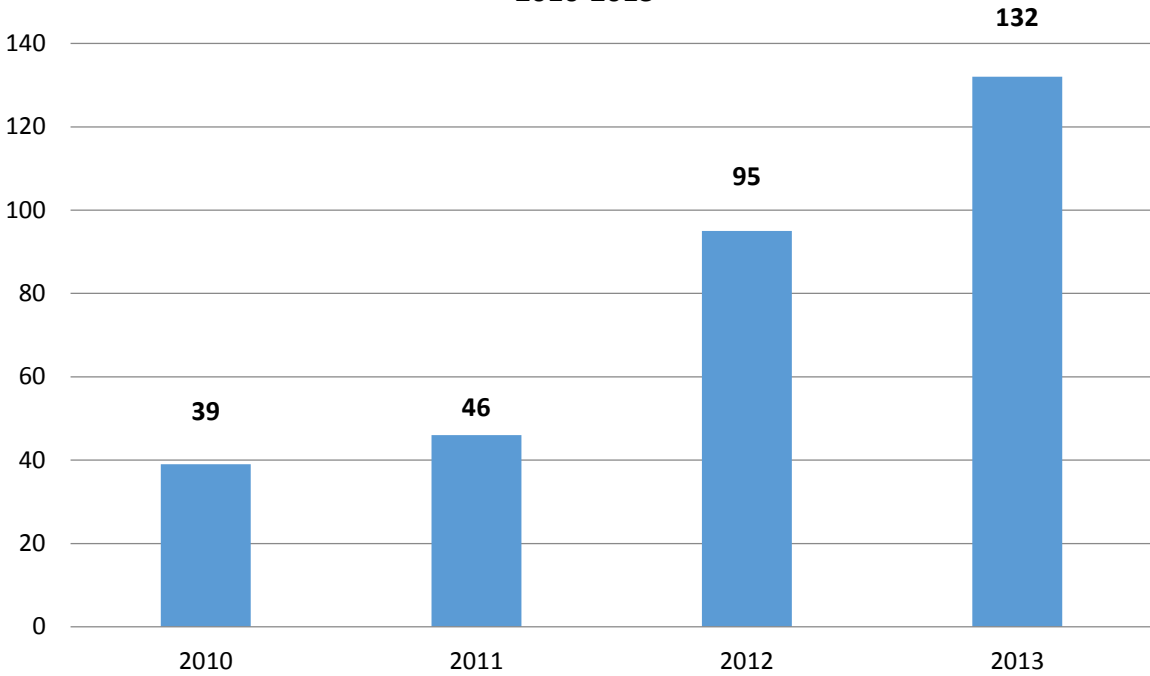


Figure 10. Total Mentions of Prescription Opioids, Benzodiazepines and Heroin, 2010-2013

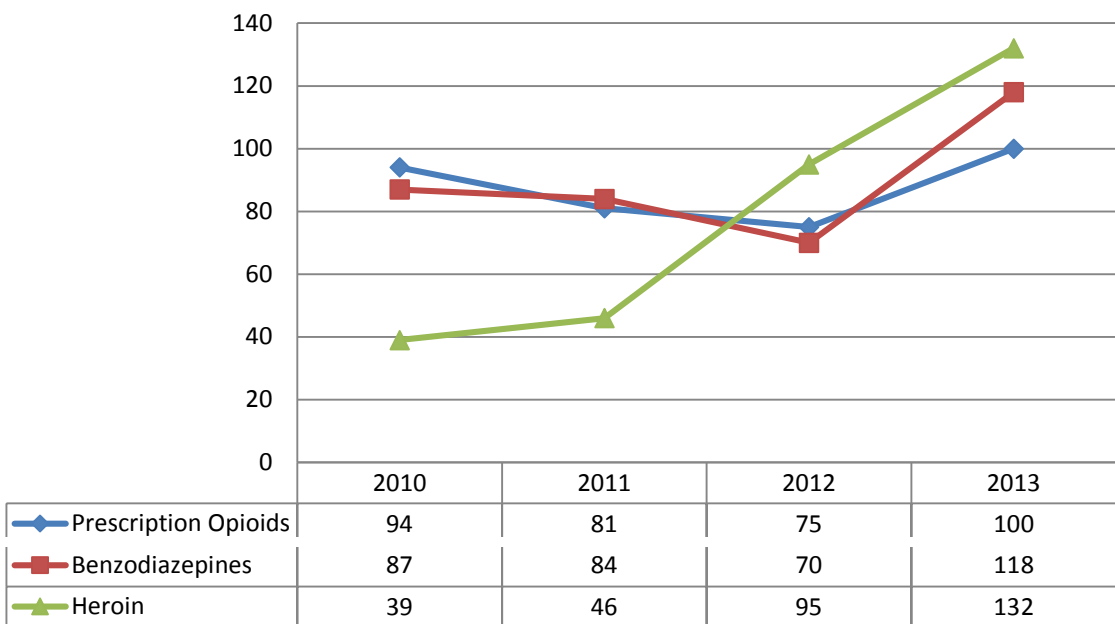
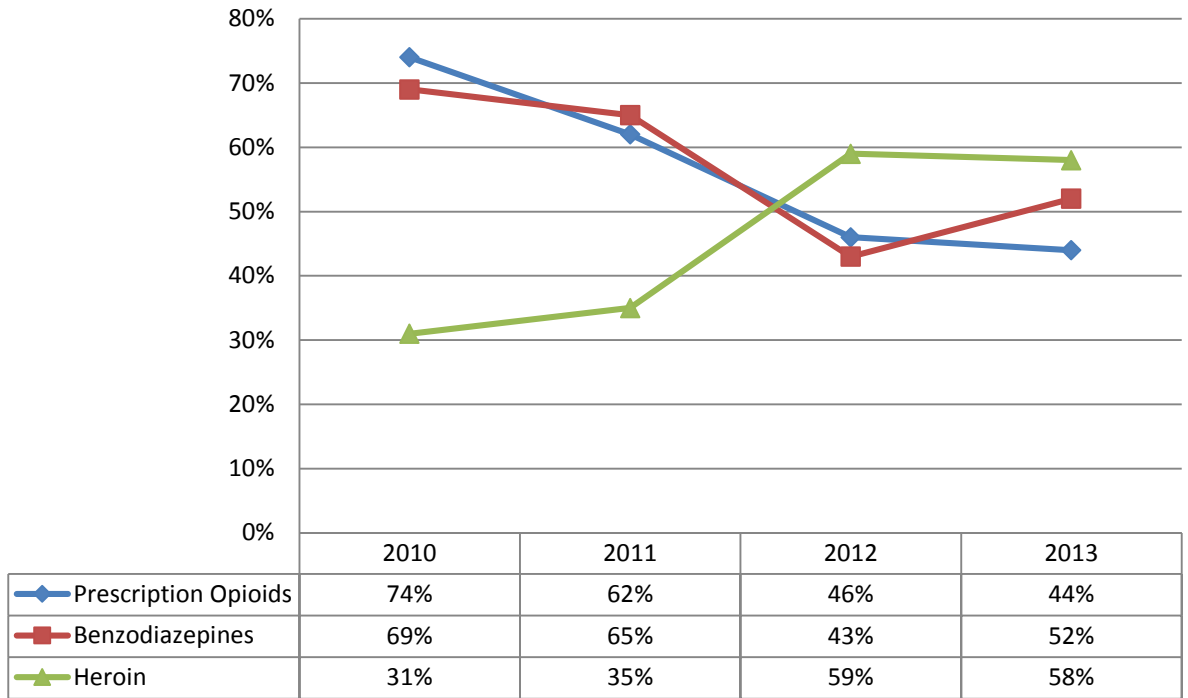


Figure 11. Percentage of Prescription Opioid, Benzodiazepine and Heroin Mentions, 2010-2013



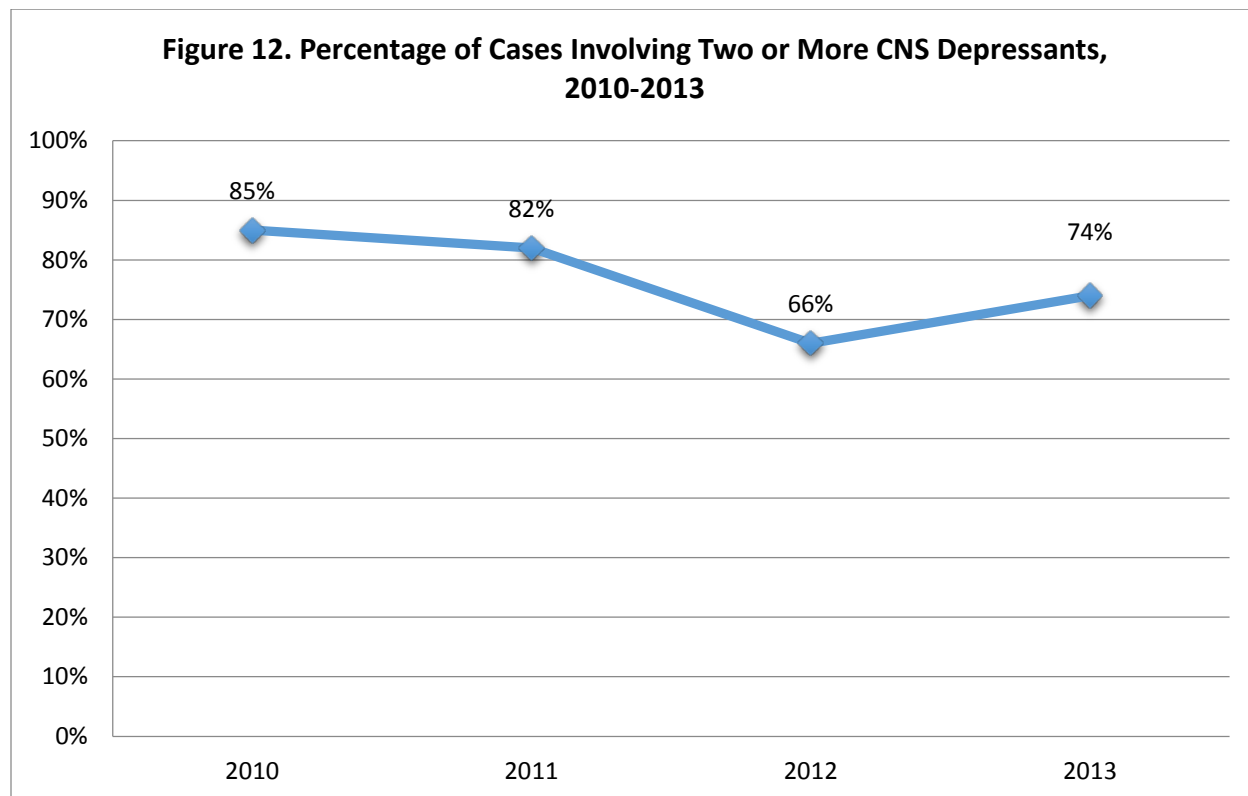
Other Drugs:

Other drugs frequently found in decedents’ bodily system or fluids include: alcohol (28%); cocaine (26%); and anti-depressants, such as citalopram (Celexa) and amitriptyline (Elavil), (27%). With one exception, there are no noteworthy trends in the mentions of these substances. The number of alcohol mentions in 2013 (63) is noticeably higher than in 2012 (46). However, the percentage of alcohol mentions was unchanged in 2012 (28%) and 2013 (28%); there is no evidence that there has been a change in availability or use of alcohol, and alcohol is seldom the principal cause of an overdose death.

Powerful Combinations:

In addition to the dangerous combination of prescription opioids and benzodiazepines, addressed earlier in this report, another powerful combination is frequently observed in Montgomery County accidental drug overdose death cases: multiple central nervous system (CNS) depressants. In 2013 nearly three-quarters of the decedents had two or more CNS depressant drugs in their systems at the time of death (see Figure 12). It is well-established that the concurrent or simultaneous use of drugs that depress the CNS, such as alcohol, prescription opioids, sedatives (including benzodiazepines), illicit

fentanyl and/or heroin, can be extremely hazardous and result in death from profound respiratory depression.



Conclusions

Data from the 2013 PDR reveal a dramatic increase in the overall number of unintentional drug overdose deaths in Montgomery County, from 162 deaths in 2012 to 226 deaths in 2013. This increase of 64 unintentional drug overdose deaths is driven, in part, by the increasing number of deaths involving heroin, a trend that began in late 2011, as well as the increase in the number of deaths involving illicit (clandestinely manufactured) fentanyl. The increase of an additional 64 accidental drug overdose cases from 2012 through 2013 doubles the increase of 32 unintentional drug overdoses from 2011 to 2012. Also significant is the increase in the number of deaths involving prescription opioids (e.g., methadone, morphine, hydrocodone), and benzodiazepines (e.g., alprazolam, clonazepam, diazepam), compared to 2012. Based on the number of cases with mentions of prescription opioids in accidental drug overdoses in 2013, it is clear that the non-medical use of prescription opioids remains a serious public health problem in Montgomery County.

The prescription drug abuse epidemic has been augmented by a significant increase in heroin use that began in late 2011. It is interesting to note there has been no noticeable change in the *proportion* of accidental drug overdose cases in which opioids (either heroin, illicit fentanyl or prescription opioids, or any combination) are involved. As indicated on page 4 of the attached *Poisoning Death Review Summary Report*, “Any Opiate (Heroin/Prescription Opioid/Illicit Fentanyl),” the occurrence of any

opioid mentions in accidental drug overdose deaths has hovered around 90% for the past 4 years, despite the increase in accidental drug overdose cases observed from 2010 through 2013. Heroin, prescription opioids, and illicit fentanyl continue to exert the primary influence on Montgomery County's accidental drug overdose deaths. The dramatic increases in unintentional drug overdoses in Montgomery County from 2012 through 2013 is an urgent public health problem that calls for collaborative intervention by the system of community partners.

MONTGOMERY COUNTY POISONING DEATH REVIEW SUMMARY REPORT, 2013

	Total Cases Jan 1-Dec 31, 2013	226		2012 Cases: 162	2011 Cases: 130	2010 Cases: 127
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DEMOGRAPHICS

Characteristic	Category	Freq	Percent	2012 Percent	2011 Percent	2010 Percent
Average Age			42.5	42.8	42.1	40.0
Age Group	<15 years	0	0%	0%	0%	0%
	15-24 years	8	4%	4%	5%	14%
	25-34 years	59	26%	28%	22%	22%
	35-44 years	63	28%	19%	26%	28%
	45-54 years	60	27%	33%	32%	18%
	55-64 years	30	13%	14%	14%	16%
	65-74 years	6	3%	2%	1%	2%
	75+ years	0	0%	0%	0%	0%
Gender	Male	152	67%	60%	59%	57%
	Female	74	33%	40%	41%	43%
Race	White	196	87%	85%	87%	90%
	Black	25	11%	14%	13%	10%
	Other	5	2%	1%	0%	0%
Education	<High School	65	29%	27%	28%	20%
	HS graduate	146	65%	69%	69%	76%
	College graduate	9	4%	2%	2%	2%
	Post-graduate	2	1%	1%	1%	1%
	Unknown	4	2%	1%	0%	0%
Marital Status	Single	98	43%	47%	39%	41%
	Married	44	21%	15%	31%	29%
	Divorced	72	32%	30%	25%	26%
	Separated	5	2%	0%	3%	2%
	Widowed	6	3%	7%	2%	2%
Military	Ever in US Armed Forces	15	7%	9%	4%	13%
Residence	Montgomery Co	197	87%	90%	91%	92%

HEALTH

Characteristic						
		Freq	Percent	2012 Percent	2011 Percent	2010 Percent
Physical Disability/Illness		176	78%	81%	74%	79%
Heart Disease		132	58%	58%	56%	65%
Mental Disability/Illness		44	19%	21%	23%	27%

HISTORY OF SUBSTANCE ABUSE						
	Total Cases Jan 1-Dec 31, 2013	226		2012 Cases: 162	2011 Cases: 130	2010 Cases: 127
Substance Abuse						
		Freq	Percent	2012 Percent	2011 Percent	2010 Percent
Any history		177	78%	78%	82%	75%
Alcohol		35	15%	17%	18%	13%
Cocaine		23	10%	12%	17%	12%
Marijuana		2	1%	2%	2%	5%
Heroin		76	34%	31%	26%	26%
Prescription opioids		15	7%	12%	27%	27%
Benzodiazepines		11	5%	7%	16%	15%
Other Prescription Medications		2	1%	1%	5%	3%
Other Medications		114	50%			
DEATH INVESTIGATION						
Characteristic	Category					
		Freq	Percent	2012 Percent	2011 Percent	2010 Percent
Location of death	Decedent's home	130	58%	50%	53%	68%
	Relative's home	2	1%	1%	0%	2%
	Friend's home	33	15%	11%	16%	14%
	Place of work	0	0%	0%	1%	0%
	School	1	0%	0%	0%	0%
	Hospital	33	15%	30%	22%	9%
	Drug tx facility	0	0%	1%	0%	0%
	Jail/detention area	0	0%	1%	0%	0%
	Public area	8	4%	2%	2%	2%
	Other	19	8%	4%	6%	4%
911 called	Yes	218	97%	94%	98%	96%
Person reporting death	Coroner	0	0%	0%	0%	1%
	Hospital physician	34	15%	33%	23%	17%
	Mortician	0	0%	0%	0%	0%
	EMS/Police	190	84%	67%	75%	82%
Possible prevention by use of opioid antagonist?		52	23%	25%	14%	11%

TOXICOLOGY REPORT						
	Total Cases Jan 1-Dec 31, 2013	226		2012 Cases: 162	2011 Cases: 130	2010 Cases: 127
Characteristic	Category	Freq	Percent	2012 Percent	2011	2010 Percent
	Alcohol	63	28%	46 (28%)	30 (23%)	29 (23%)
	Cocaine	59	26%	49 (30%)	53 (41%)	38 (30%)
	Methamphetamine	6	3%	4 (2%)	2 (2%)	1 (1%)
	Heroin	132	58%	95 (59%)	46 (35%)	39 (31%)
	Illicit Fentanyl	20	9%	0%	0%	0%
Prescription Opioids	Any	100	44%	75 (46%)	81 (62%)	94 (74%)
	Oxycodone	24	11%	25 (15%)	25 (19%)	29 (23%)
	Hydrocodone	22	10%	15 (9%)	19 (15%)	31 (24%)
	Methadone	31	14%	20 (12%)	43 (33%)	41 (32%)
	Fentanyl	14	6%	9 (6%)	8 (6%)	9 (7%)
	Tramadol	15	7%	9 (6%)	5 (4%)	8 (6%)
	Hydromorphone	1	0%	0 (0%)	0 (0%)	1 (1%)
	Morphine	16	7%	10 (6%)	10 (8%)	11 (9%)
	Other	1	0%	2 (1%)	4 (3%)	5 (4%)
Anti-Depressants	Any	61	27%	88 (26%)	41 (32%)	48 (38%)
Sedatives (Including Benzodiazepines)	Any	133	59%	88 (54%)	96 (74%)	96 (76%)
Benzodiazepines	Any	118	52%	70 (43%)	84 (65%)	87 (69%)
Any Prescription Opioid + Any Benzodiazepine		67	30%	43 (27%)	64 (49%)	73 (57%)
Two or more of the following CNS depressants: alcohol, heroin, illicit fentanyl, prescription opioids, sedatives		167	74%	107 (66%)	107 (82%)	108 (85%)
Heroin + Any Other CNS Depressant		111	49%	65 (40%)	40 (31%)	34 (27%)
Heroin with No Other CNS Depressant		21	9%	30 (19%)	6 (5%)	5 (4%)
Heroin + Any Prescription Opioid		25	11%	22 (14%)	13 (10%)	16 (13%)
Any Opiate (Heroin/Prescription Opioid/Illicit Fentanyl)		204	90%	148 (90%)	114 (88%)	117 (92%)
Any Rx Opiate without Heroin		74	33%	50 (31%)	66(51%)	77(61)%
Other Prescription	Any	62	27%	49 (30%)	48 (37%)	49 (39%)
Over-The-Counter	Any	32	14%	32 (20%)	25 (19%)	26 (20%)
Verifiable Valid Prescription for Controlled Drugs in Toxicology Report		166	35%	109 (36%)	124 (37%)	118 (33%)