

# Montgomery County Poisoning Death Review: 2010-2014

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## Montgomery County Poisoning Death Review: 2010—2014

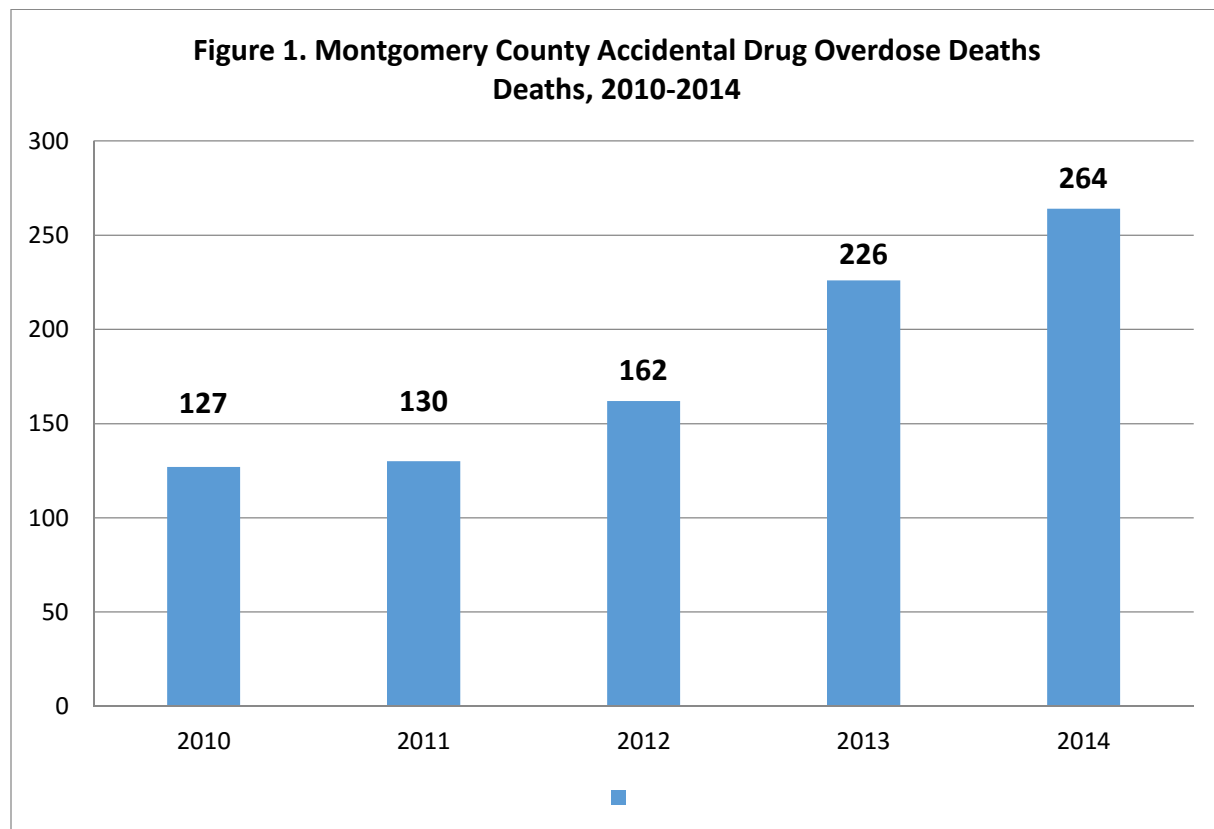
### Summary

- 2014 saw another dramatic increase in the overall number of unintentional drug overdose deaths in Montgomery County, from 226 deaths in 2013 to 264 in 2014. Unintentional drug overdose deaths have increased each year since 2010. The increase of 64 deaths from 2012 through 2013 and 41 deaths from 2013 through 2014, a 63% increase in the last two years, is staggering.
- 2014 continued the significant three-year trend of high levels of deaths involving heroin. The increase in heroin mentions is quite dramatic over the five-year period of the Poisoning Death Review: only 39 cases with heroin mentions in 2010, 46 in 2011, rising to 95 in 2012, 132 in 2013, and 127 in 2014. This is a 226% increase from 2010 to 2014.
- Illicit fentanyl, which was first observed in the last two months of 2013, has been established as a substantial contributor to accidental overdose deaths in Montgomery County. There were 107 illicit fentanyl mentions in 2014, which placed this dangerous clandestinely manufactured drug alongside heroin as one of the principal drugs in the overdose epidemic. Illicit fentanyl is sometimes combined with heroin. However, of the 107 illicit fentanyl cases, 71 had no heroin present.
- The increase in prescription opioid mentions observed in 2013 was sustained in 2014. These mentions do not include illicit fentanyl. Even though the number of mentions has been up over the last two years, the percentage of deaths in which prescription opioids were present continued to decline. 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 and 98 (37%) in 2014.
- The increase in benzodiazepine mentions observed in 2013 continued in 2014. While the percentage of deaths in which benzodiazepines are mentioned is still well below 2010-2011 levels (76% and 74% in 2010 and 2011, versus 52% and 51% in 2013 and 2014), the overall numbers of benzodiazepine mentions continues to rise.
- The prevalence of any opiate (heroin, prescription opioids, and/or illicit fentanyl) in accidental drug overdose deaths has hovered around 90% for the past five years.
- The scope of unintentional overdose deaths in Montgomery County has been recognized for some time. In 2010, when the PDR process was initiated, Montgomery County led the state in the rate of unintentional overdose cases. The continued dramatic escalation in the number of unintentional drug overdoses in Montgomery County from 2012 through 2014 suggests that this public health problem calls for substantial increases in collaborative intervention by the system of community partners.

## Introduction

In 2014, 264 unintentional drug overdose deaths, the highest number on record, occurred in Montgomery County, Ohio. 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 as either unintentional (accident) or intentional (suicide) is made by the Montgomery County Coroner. This is the fifth year the PDR has been conducted.

In 2010, 127 unintentional drug overdose deaths occurred in Montgomery County; in 2011, 130; in 2012, 162; and in 2013, 226 (see Figure 1). Of the 264 decedents in 2014, 237 were Montgomery County residents. Based on Montgomery County 2010 (US Census Bureau) population of 535,141, the 237 unintentional overdose deaths in 2014 represent an unadjusted rate of 44.3 per 100,000. The Ohio death rate per 100,000 for 2013 (the latest figure available) was 18.2 (Ohio Department of Health). A numerical summary of the PDR data, including 2014 data and comparisons to 2010-2013, is attached to this narrative.



## Demographic and Health Characteristics of Decedents

Of the 264 decedents, 237 (90%) were Montgomery County residents and 20 were residents of other Ohio counties (7 Greene; 3 Miami; and one each from Mercer, Auglaize, Clark, Clermont, Clinton, Cuyahoga, Franklin, Highland, Lorain and Warren). Seven were out-of-state residents (Illinois (2), Florida, Indiana, Kentucky, Tennessee and West Virginia). The total for Montgomery County does not include individuals who were residents of Montgomery County, but who died in other counties or states.

As in previous years, a majority of the decedents were white (89%), male (62%), and had a highest educational level of high school or GED (73%). The three age groups with the highest proportion of deaths were 25-34 year olds (28%), 35-44 year olds (26%), and 45-54 year olds (23%), together accounting for 78% of the 2014 decedents, essentially unchanged from 2013. The mean age was 41.2.

Autopsy results revealed that a majority of the decedents had a history of physical illness or disability (68%), with heart disease common (52%). As in all previous years, a majority (76%) had a history of substance abuse. Since the history of substance abuse came from reports made by family, friends, or witnesses, there may be additional instances of a history of substance abuse that were not recorded. Most of the deaths occurred in the decedents' or decedents friends' homes (66%).

## Drug Toxicology Data

### *Definition of Drug “Mentions”*

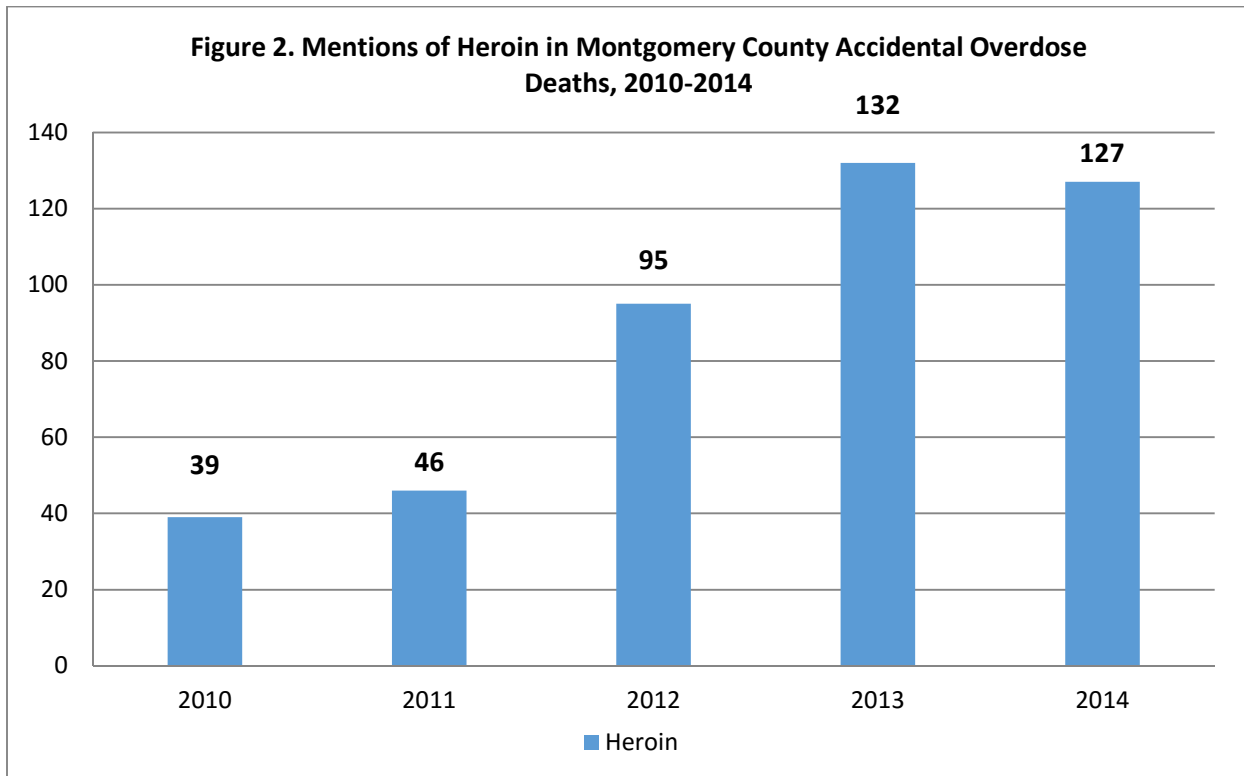
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A drug “mention” means that a specific drug was found in a bodily system or fluid of a decedent, not that that drug was necessarily the sole cause of death. The presence of more than one drug can result in more than one mention from a single decedent.

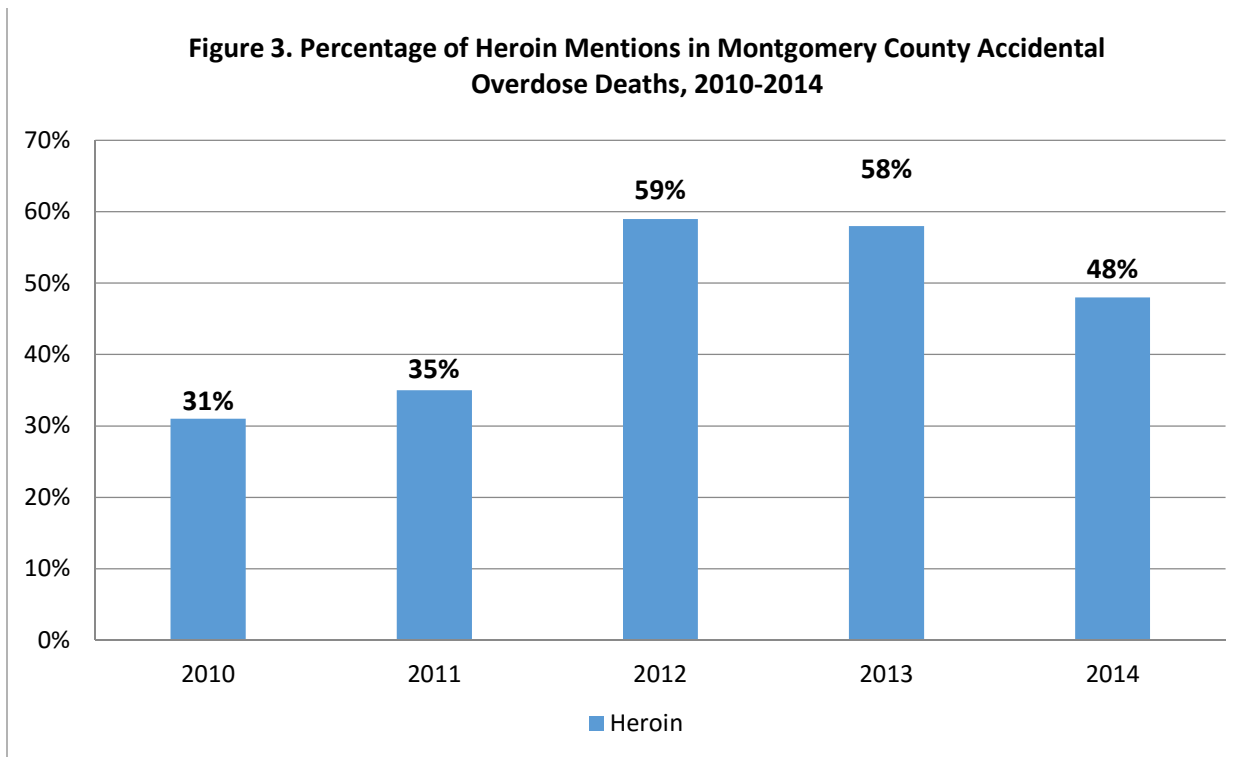
### *Heroin*

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**Heroin was present in 127 cases in 2014, 48% of all deaths. This is a continuation of a significant three-year trend of high levels of deaths involving heroin.** This trend is quite dramatic over the five year period of the Poisoning Death Review: 39 cases with heroin mentions in 2010, 46 in 2011, 95 in 2012, 132 in 2013 and 127 in 2014—an increase of 226% since the first year of the PDR (see Figure 2).

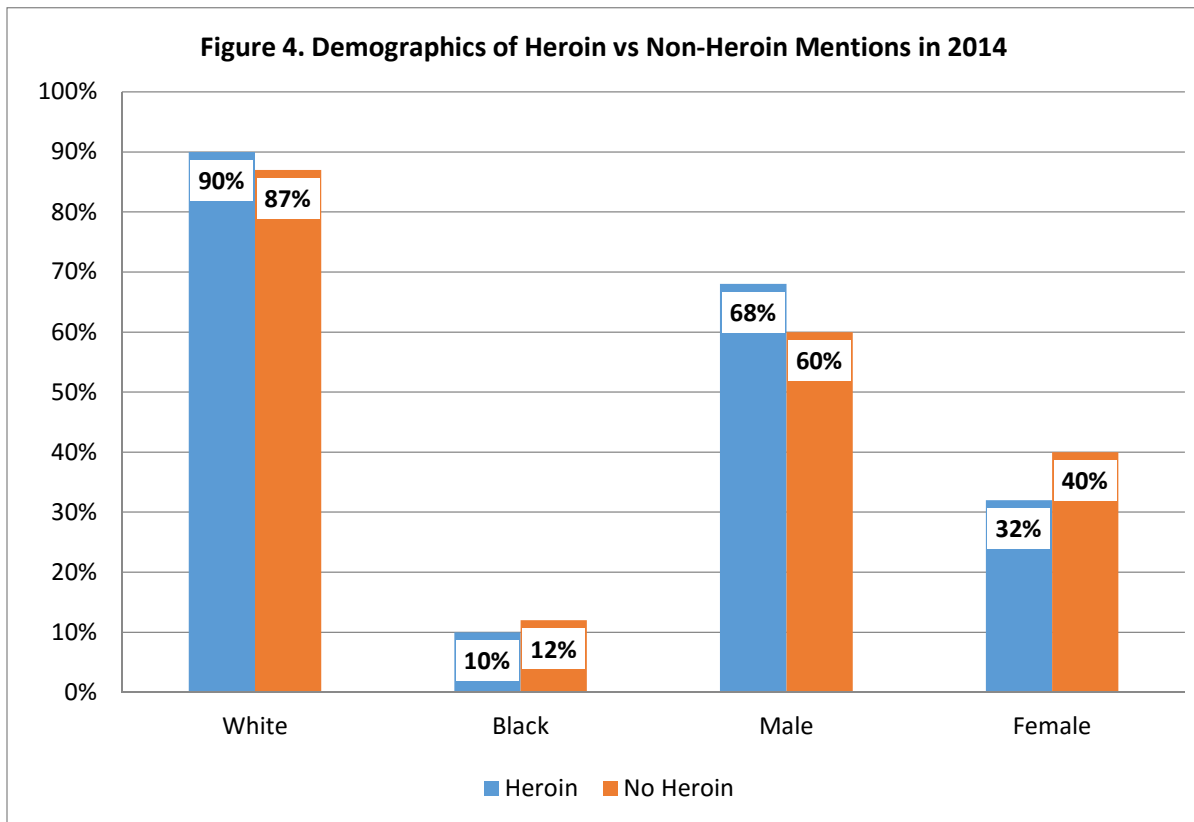


Even though the total number of mentions of heroin was nearly equal to 2013, heroin was mentioned in a lower *percentage* of deaths than the 58% in 2013 (see Figure 3). It is possible that the decrease in the percentage of heroin cases from 2013 to 2014 is due to the increasing use of illicit fentanyl.



Twenty-eight percent of all decedents with heroin mentions also had illicit fentanyl in their systems, and 23% of them also had at least one prescription opioid in their systems. We discuss these combinations later in this report.

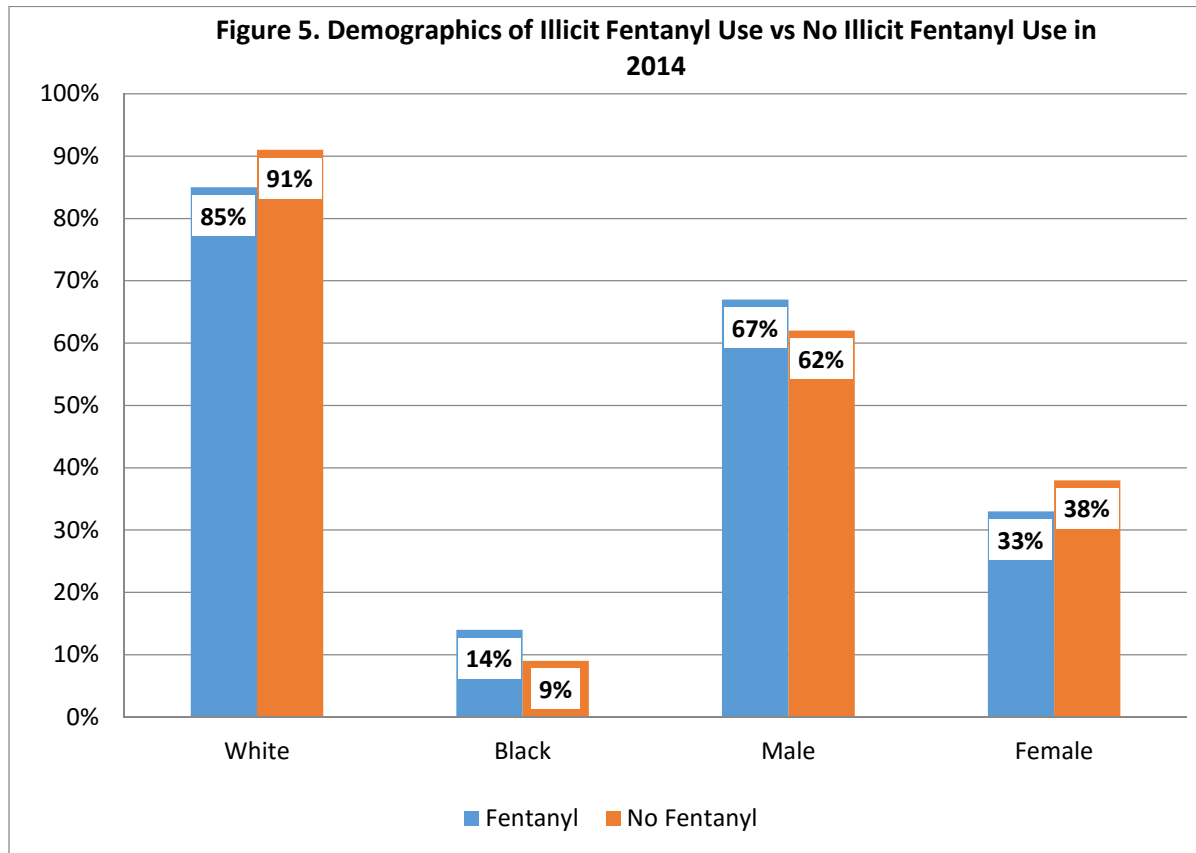
Since heroin plays such a significant role in Montgomery County accidental drug overdose deaths, we examined the demographics of those with and without heroin in their systems. There were only minor differences in race/ethnicity (heroin: 90%; no heroin: 87%) and marital status (heroin: 46%; no heroin: 43%). However, heroin users were slightly younger (average age for those with heroin: 40.3; no heroin: 41.5) and were more likely to be male (heroin: 68% male; no heroin: 60% male). See Figure 4. In addition, heroin users were somewhat less likely to have completed high school or have a GED (heroin: 70%; no heroin: 78%).



## Illicit /Clandestinely Manufactured Fentanyl

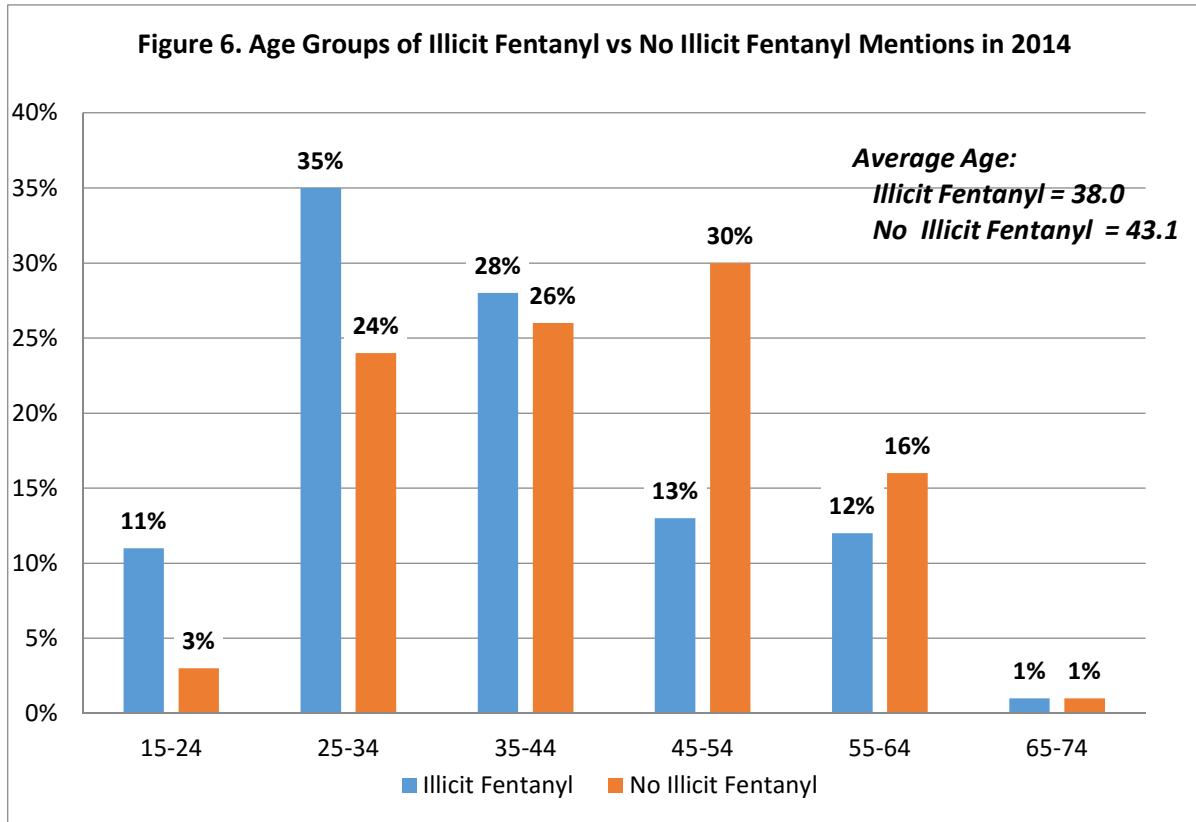
The presence of illicit fentanyl was a significant element in the drug overdose picture in Montgomery County in 2014. There was a significant rise in the presence of illicit fentanyl (clandestinely manufactured fentanyl, rather than fentanyl patches used to treat pain). Since the appearance of illicit fentanyl in drug overdose deaths was first observed in Montgomery County in the last two months of 2013, there is no historical trend to display. There were 107 illicit fentanyl mentions in 2014 (41% of all decedents). We note that, as in 2013, this report distinguishes illicit fentanyl from fentanyl mentions that almost certainly resulted from prescription forms of the drug, such as transdermal patches (which we classify as a prescription opioid). The prescription form of fentanyl is included in our discussion of prescription opioids below.

Examining the demographics of those with and without illicit fentanyl in their systems revealed slight differences in race and gender (see Figure 5). Those decedents who had used illicit fentanyl were slightly less likely to be white and slightly more likely to be male.





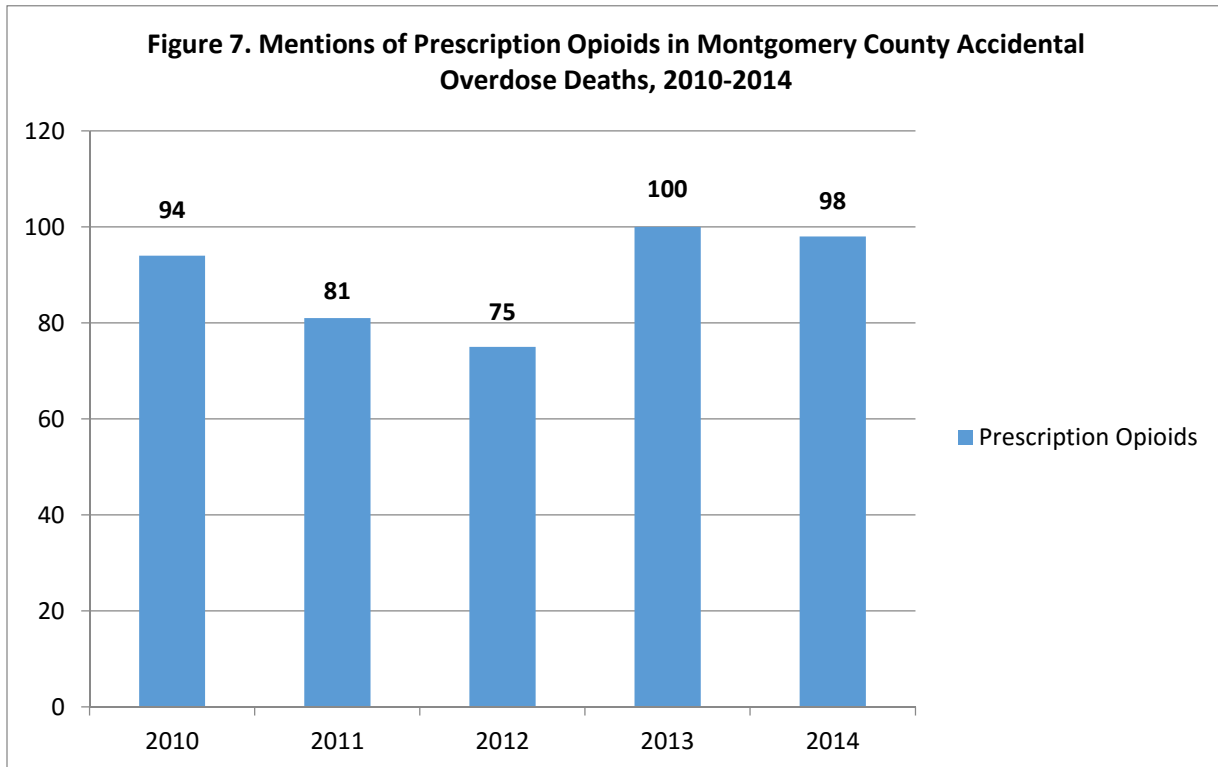
Illicit fentanyl users were younger than those who had not used fentanyl, with mean age 38.0 for illicit fentanyl users versus 43.1 for decedents who did not have illicit fentanyl in their systems. The difference was most notable in the 25-34 year old range and the 45-54 year old range (see Figure 6).



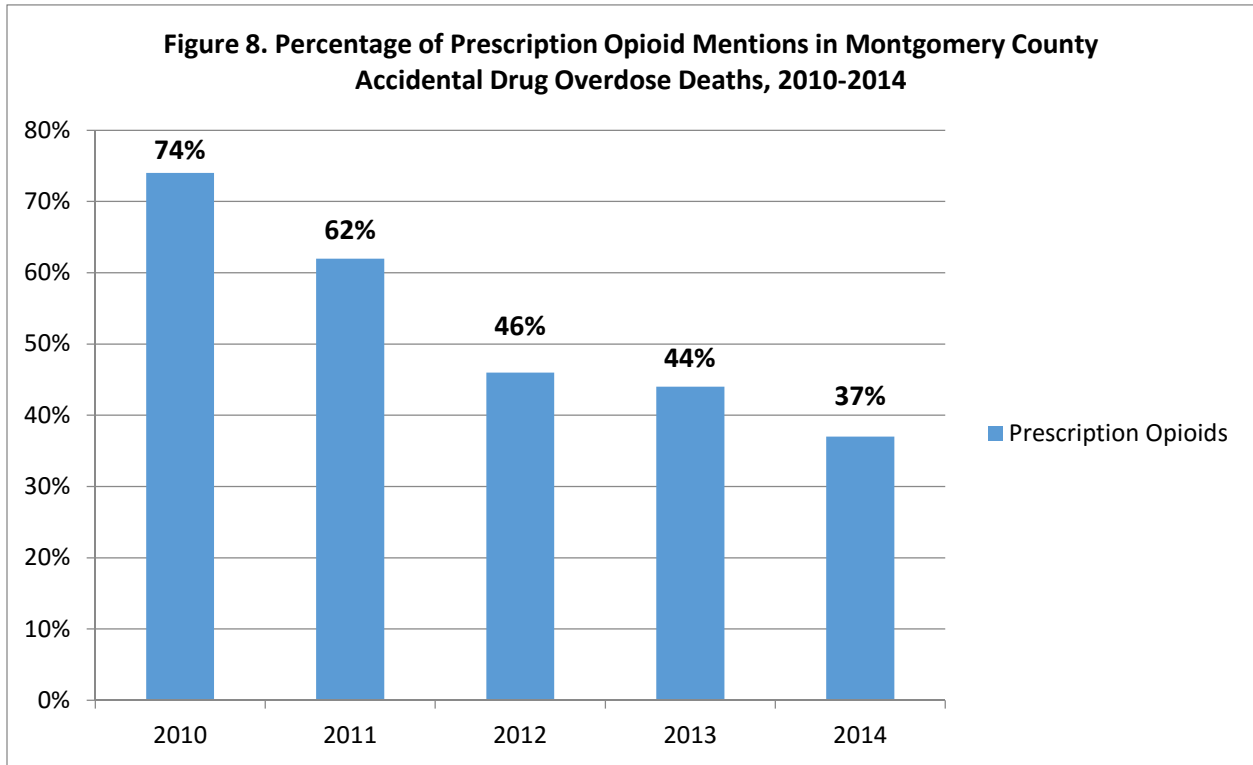
## Prescription Opioids

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Prescription opioids (drugs such as hydrocodone, oxycodone, or methadone used to treat pain) continue to be a significant factor in unintentional drug overdose deaths. This class of drugs was mentioned in 98 cases in 2014, essentially unchanged from 2013. However, this is a marked increase of 31% from the levels seen in 2012 (see Figure 7).



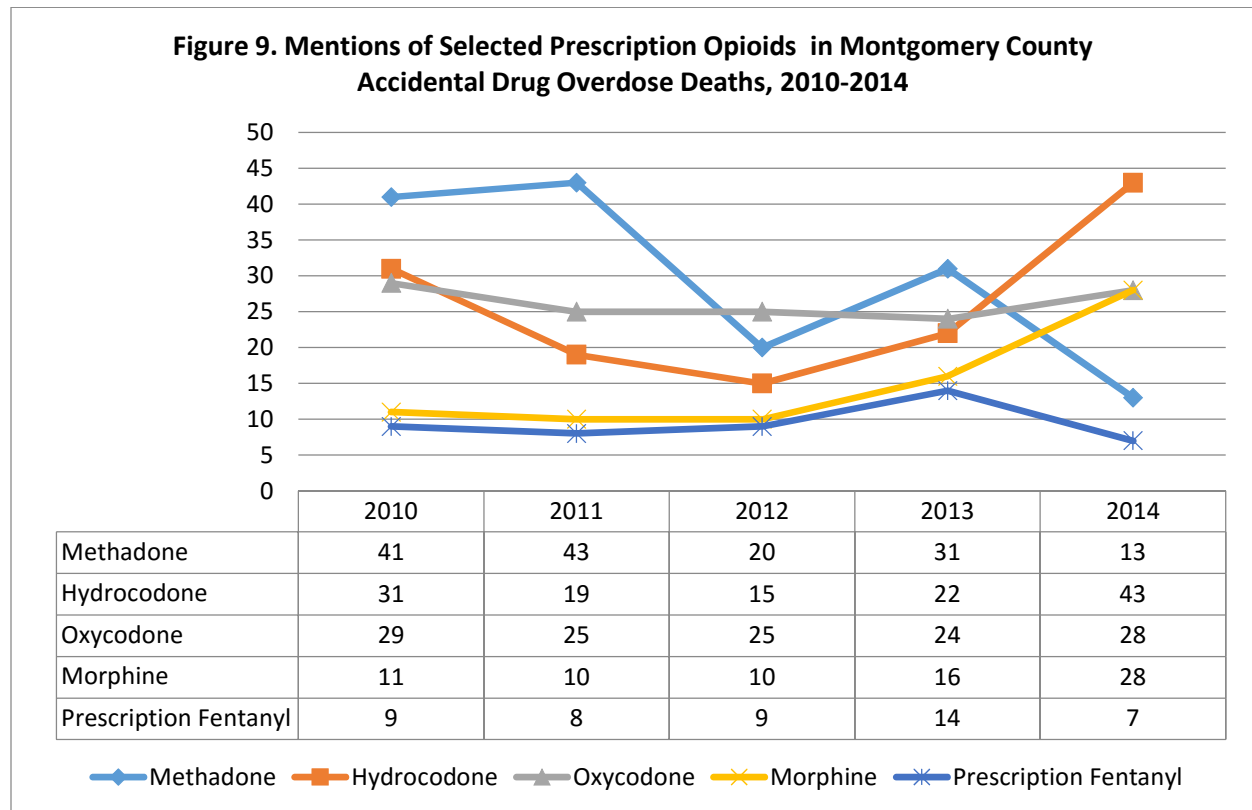
The *percentage* of prescription opioid mentions in Montgomery County's overall accidental drug overdose deaths decreased, continuing a pronounced five year trend, decreasing from 74% in 2010 to 37% in 2014 (see Figure 8).



Some of the specific prescription opioids mentioned in toxicology reports varied substantially from 2013 to 2014. For example, mentions of hydrocodone in 2014 (43, 16% of all accidental drug overdose deaths) were nearly double the 2013 total (22, 10%) (Figure 9). In addition, methadone mentions decreased substantially from 31 (14%) in 2013 to 13 (5%) in 2014. The number of prescription fentanyl mentions decreased by 50% from 14 in 2013 to 7 in 2014.

Comparing 2014 prescription opioid mentions with mentions observed at the beginning of the PDR (2010, which was the year with the highest mentions *and* percentage mentions of prescription opioids):

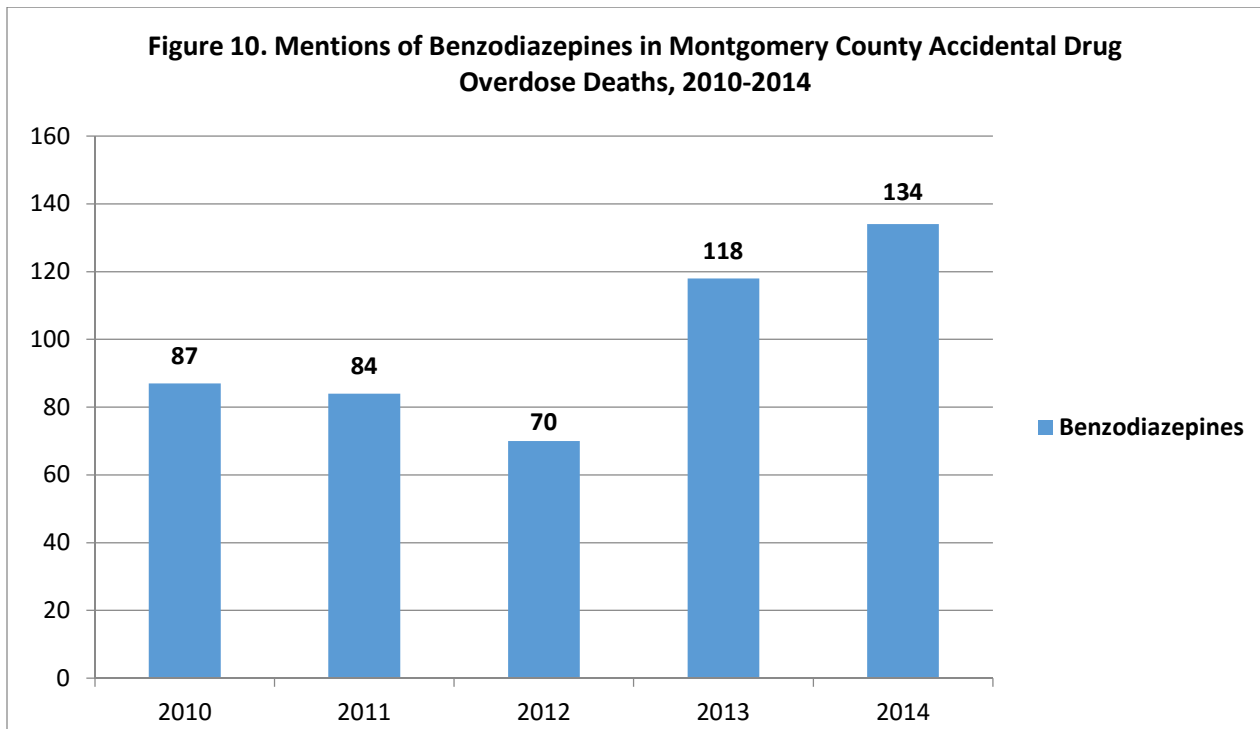
1. Mentions of methadone in 2014 are down sharply from 2010. [Note: The methadone identified in toxicological analyses had almost certainly been prescribed for pain, *not* diverted from drug abuse treatment programs].
2. Mentions of oxycodone and prescription fentanyl in 2014 are nearly the same as in 2010.
3. Hydrocodone and morphine mentions have risen substantially from 2010 to 2014. Hydrocodone mentions have risen 39%, and morphine mentions have risen 155% since 2010.



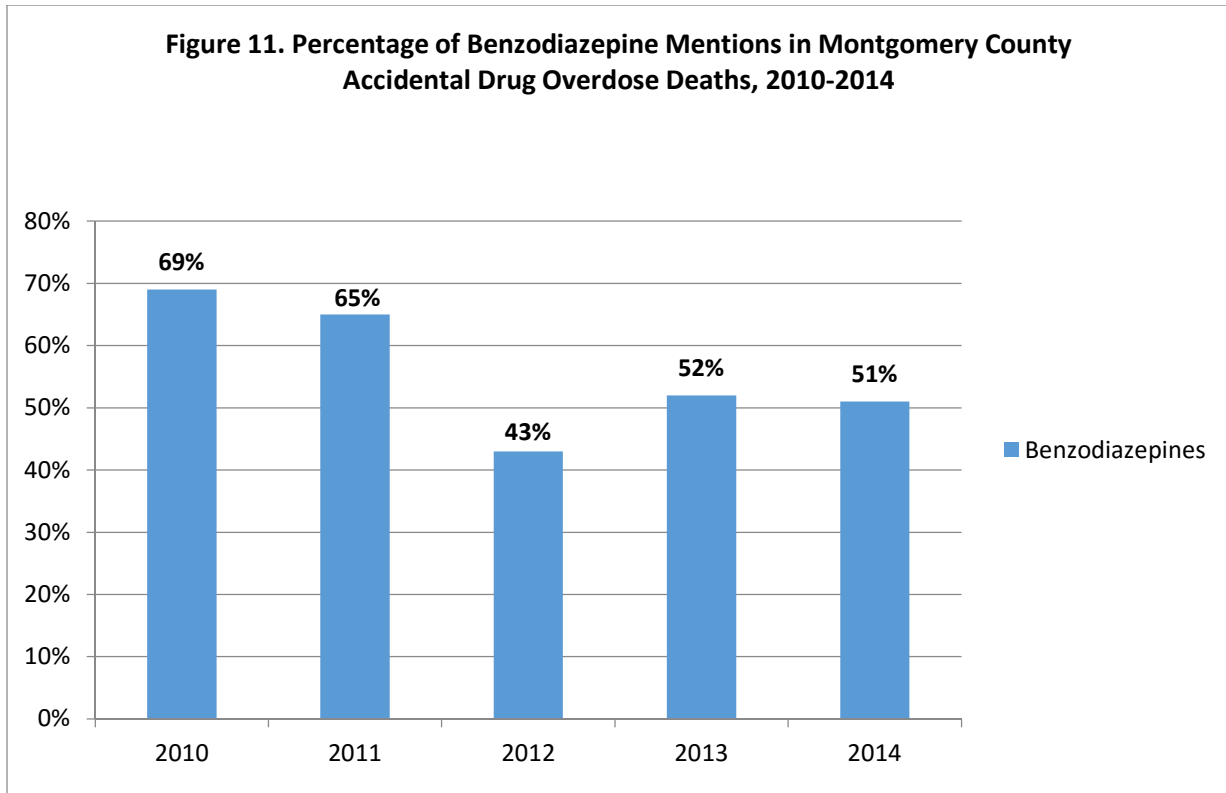
## Benzodiazepines

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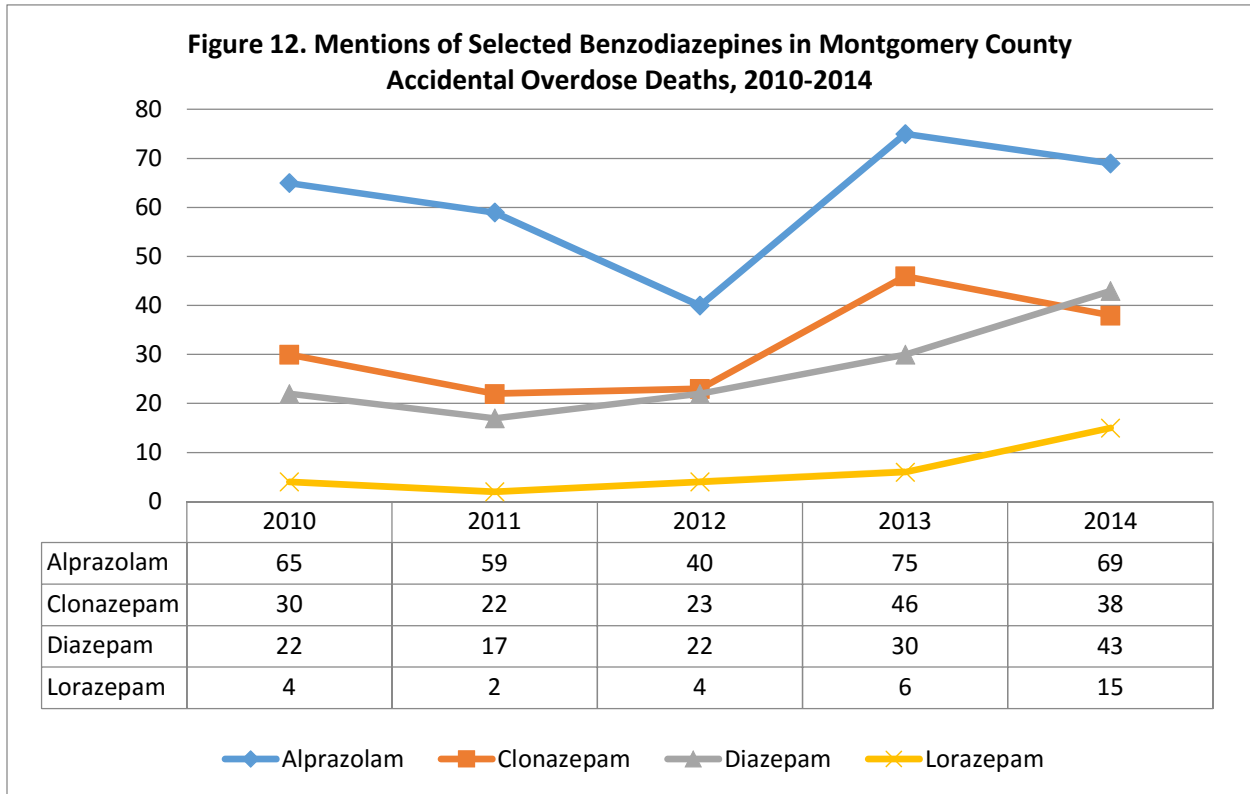
In 2014, the number of mentions of benzodiazepines continued the increase observed in 2013. There were 118 benzodiazepine mentions in 2013 and 134 in 2014 (see Figure 10). These are significantly higher than the 70 benzodiazepine mentions in 2012, which was the lowest year for benzodiazepine mentions.



In 2014, the *percentage* of benzodiazepine mentions in Montgomery County’s overall accidental drug overdose deaths held steady at around 50%. Unlike the uniform decreases in the *percentage* of prescription opioid mentions from 2010-2014, the *percentage* of benzodiazepine mentions reached a low point in 2012 and demonstrated higher percentages over the last two years (see Figure 11).

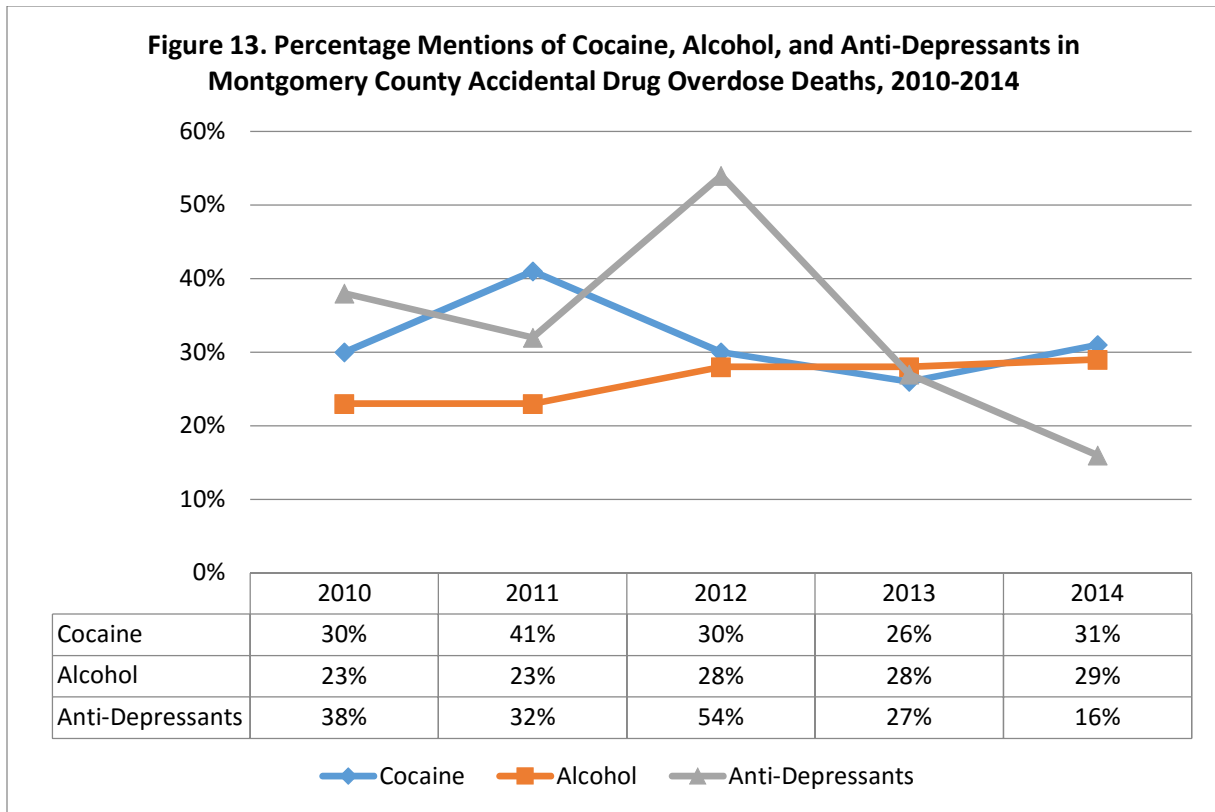


Examining specific benzodiazepines, 2014 saw slight decreases in mentions of alprazolam and clonazepam, which were the two most frequently occurring benzodiazepines in 2013. Mentions of diazepam and lorazepam increased (see Figure 12).



**Other Drugs:**

Other drugs frequently found in decedents' bodily system or fluids in 2014 included: cocaine (31%); alcohol (29%); and anti-depressants (such as citalopram (Celexa) and amitriptyline (Elavil)), 16%. With one exception, there are no noteworthy trends in the mentions of these substances. The percentage of mentions of anti-depressants reached a high point in 2012 with 88 mentions, which was 54% of all 2012 accidental drug overdose deaths. Over the last two years, percentage mentions of anti-depressants has decreased markedly (see Figure 13).

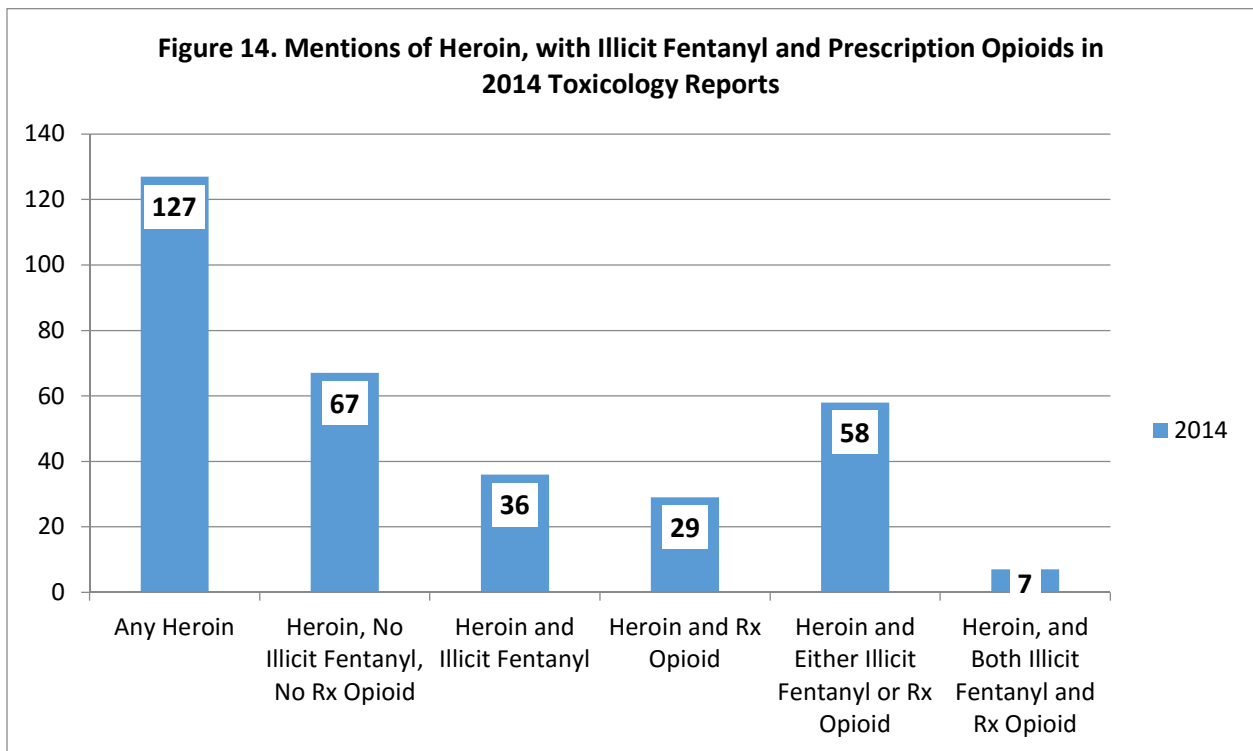




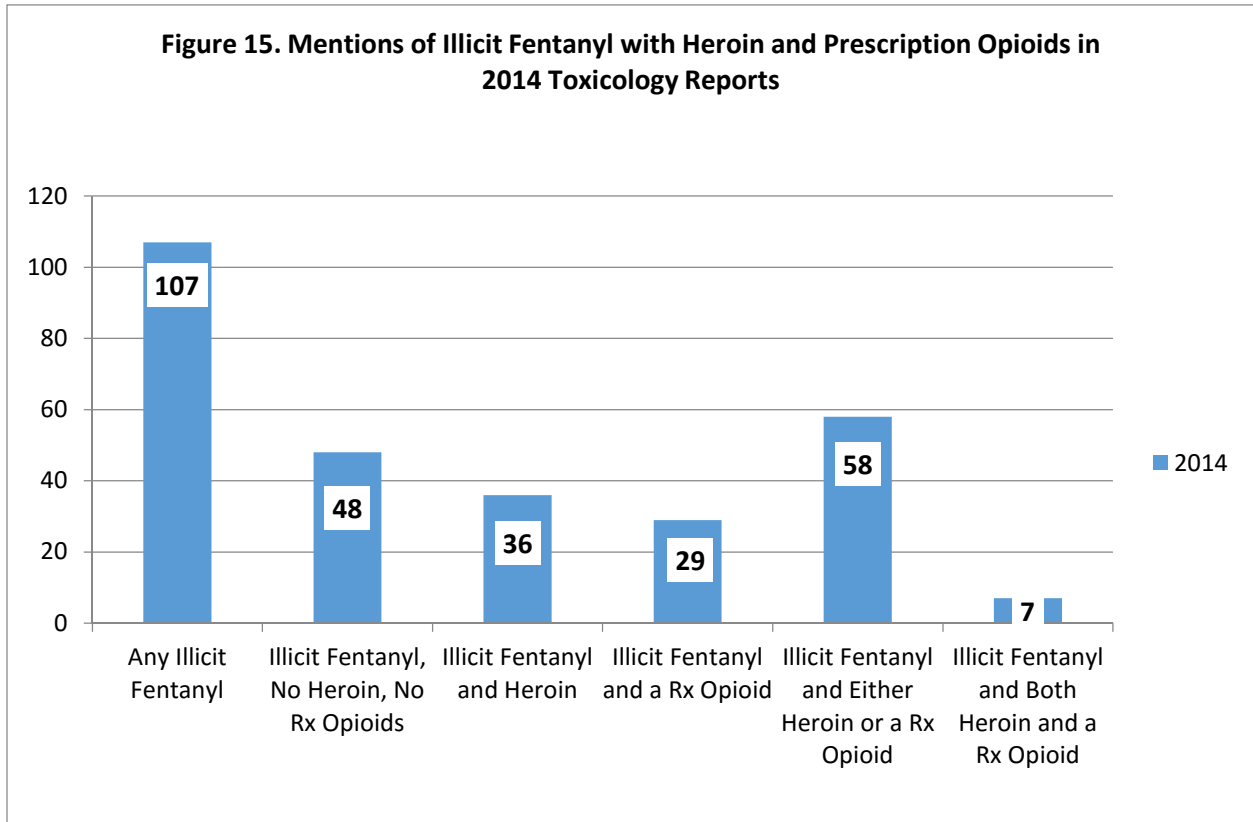
**Powerful Combinations:**

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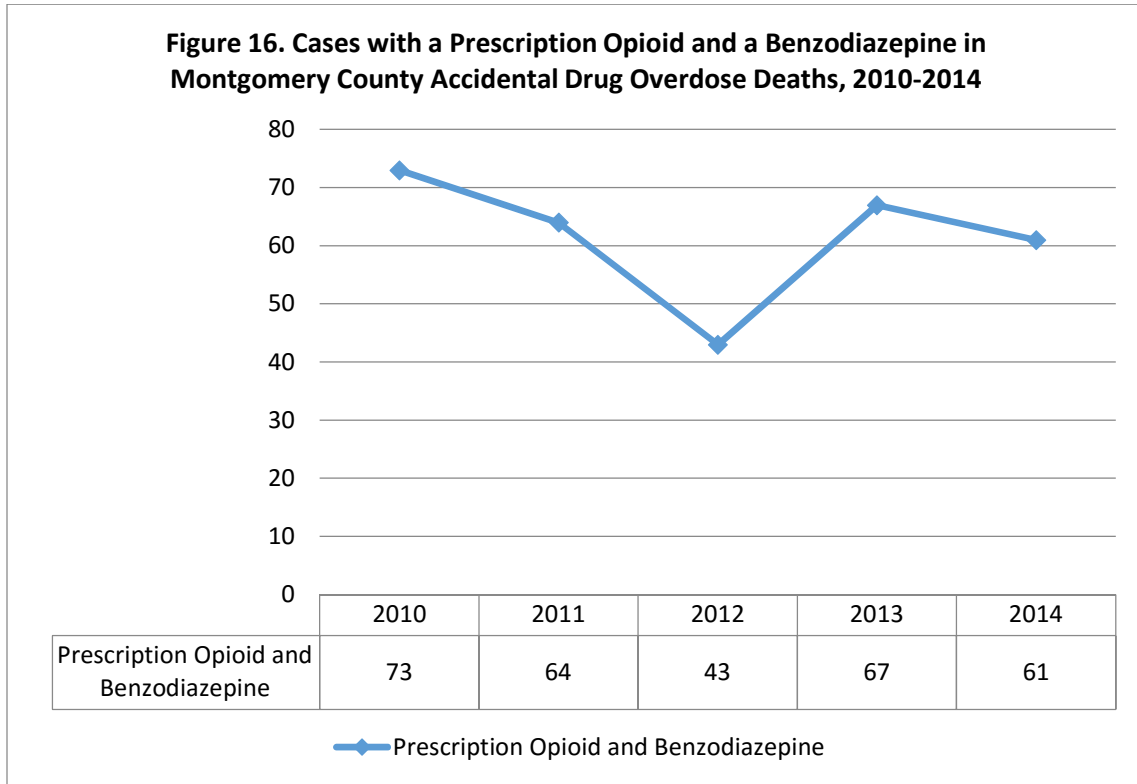
The combination of heroin with either illicit fentanyl or prescription opioids is particularly dangerous due to the increased risk of respiratory depression. There were 58 cases in 2014 in Montgomery County where heroin was mentioned in combination with illicit fentanyl or a prescription opioid (see Figure 14). There were 36 cases where illicit fentanyl was present with heroin, and 29 cases where prescription opioids were present with heroin.



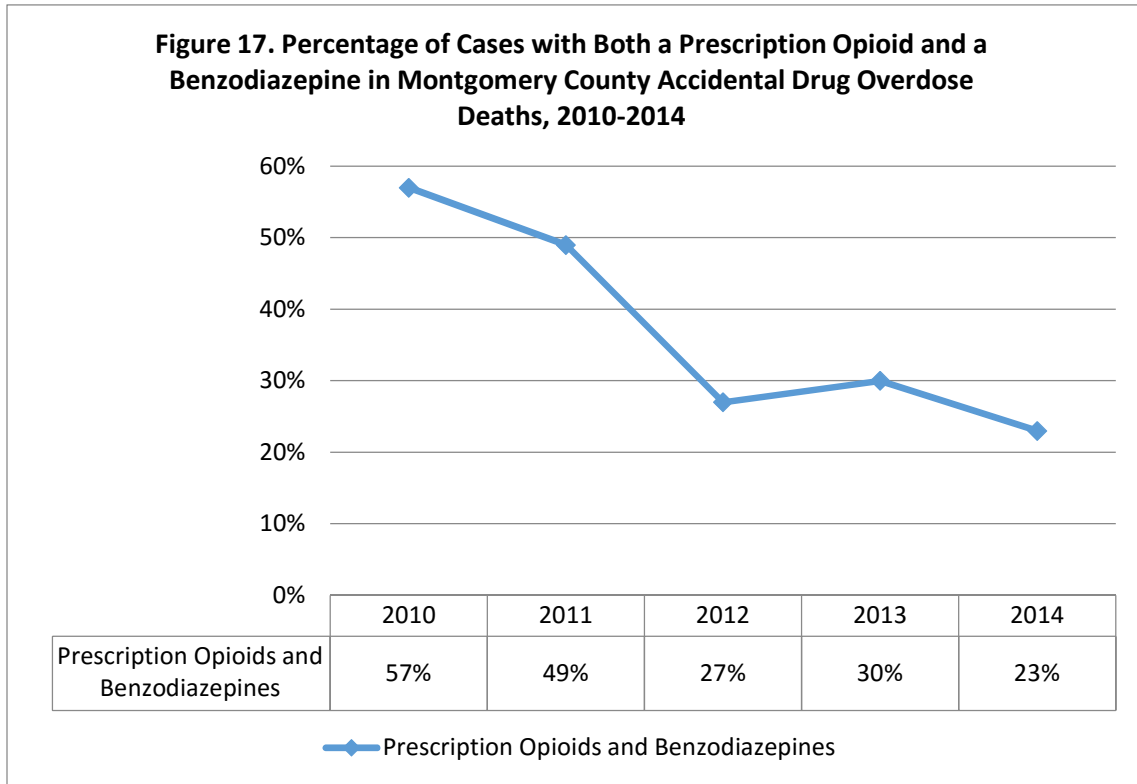
Illicit fentanyl was also frequently accompanied by heroin and/or prescription opioids, as shown in Figure 15. In over half of the 107 deaths involving illicit fentanyl, either heroin or a prescription opioid was also present (58).



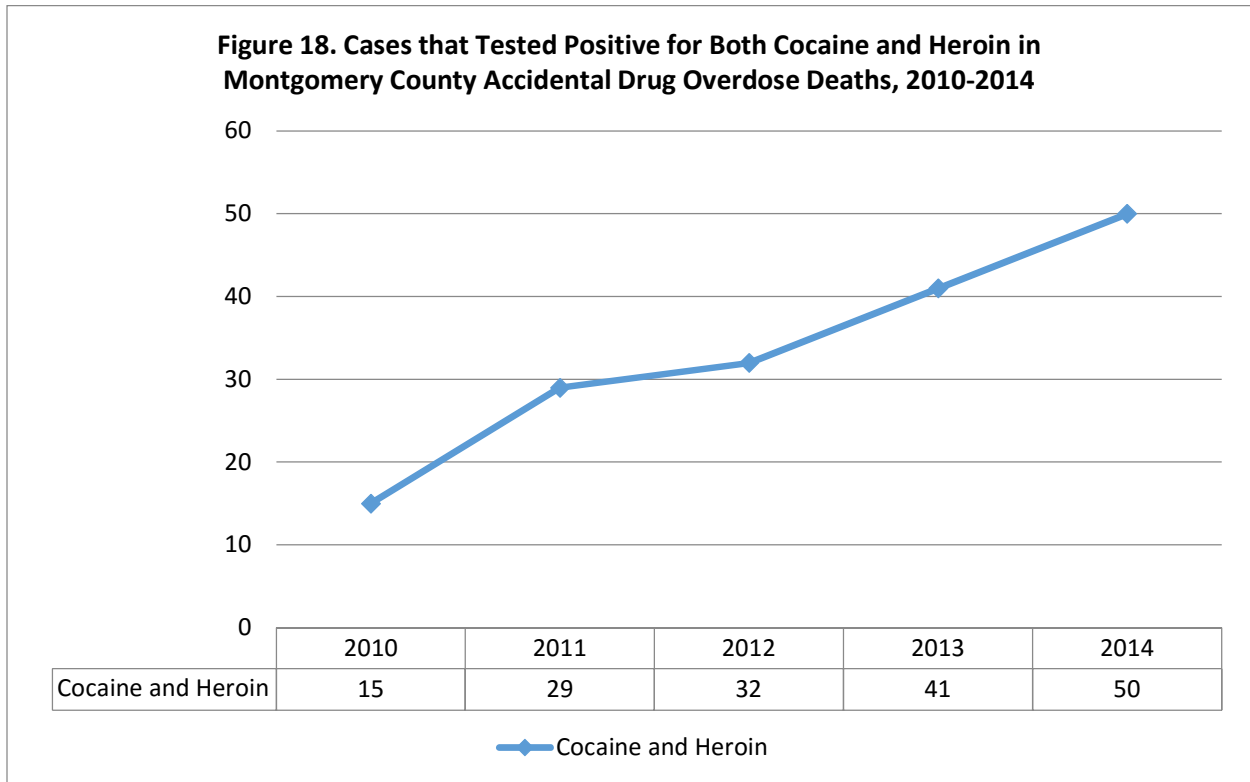
Prescription opioids and benzodiazepines are also dangerous in combination. Figure 16 shows the trend for cases from 2010 to 2014 that tested positive for both a prescription opioid and a benzodiazepine. The combination of prescription opioids and benzodiazepines decreased slightly in 2014, but was near the average level for this five year period.



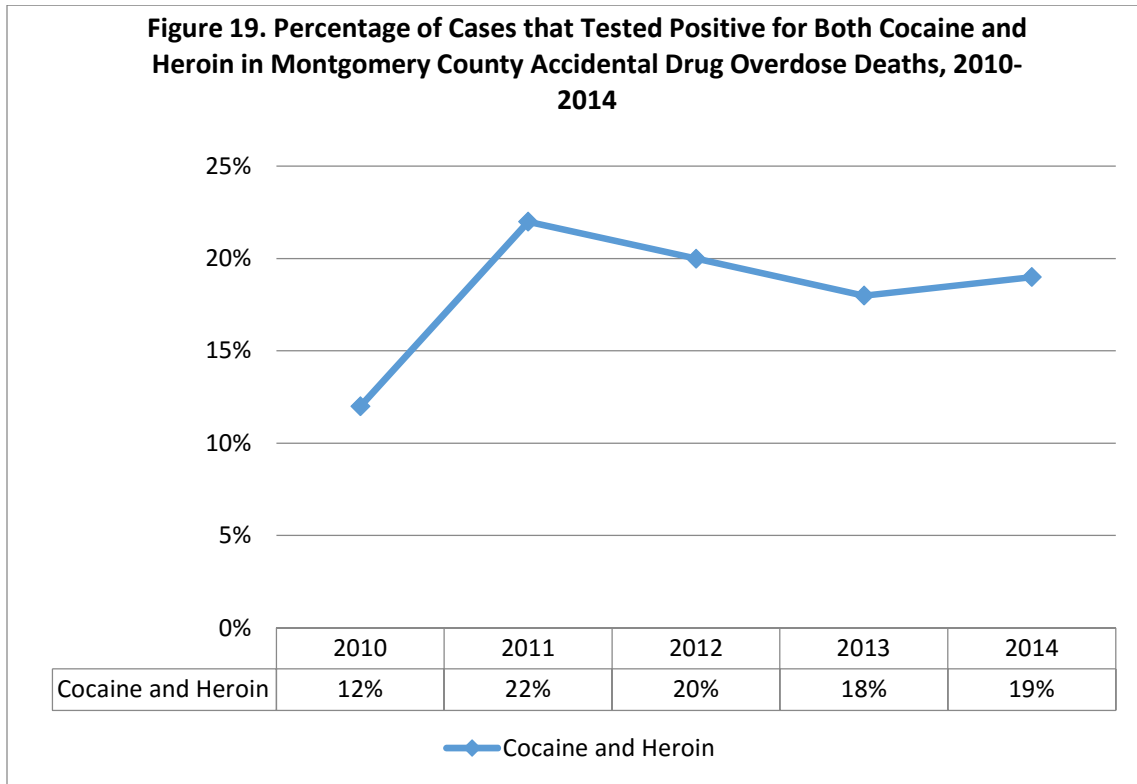
When examining the *percentage* of accidental drug overdose deaths in which prescription opioids were present with benzodiazepines, there is a fairly consistent five year decline from 57% in 2010 to 23% in 2014 (see Figure 17).



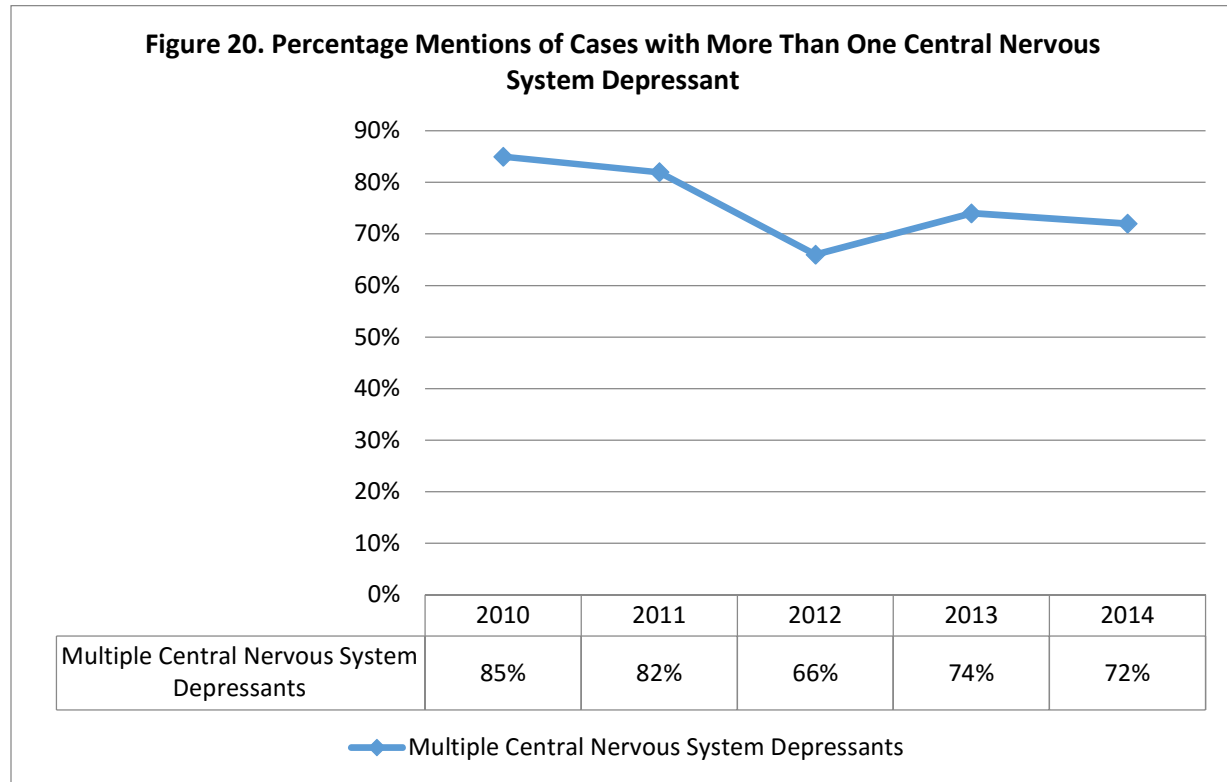
In the five-year period of the Poisoning Death Review, there has been a steady increase in the number of cases that tested positive for both cocaine and heroin (see Figure 18). This is a remarkable increase of 233% from 2010 to 2014.



Examining the *percentage* of cases in which cocaine and heroin were both present, there was a significant rise in 2011, followed by slight decreases in 2012 and 2013 and a leveling off in 2014 (see Figure 19).



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. In 2014 nearly three quarters of the decedents had two or more CNS depressant drugs in their systems at the time of death (see Figure 20).



## Conclusions

Data from the 2014 PDR reveal a continuation of the increases in the overall number of unintentional drug overdose deaths in Montgomery County, from 127 deaths in 2010 to 130 in 2011, to 162 in 2012, and then the dramatic jump to 226 deaths in 2013 and 264 deaths in 2014. The increases since 2012 are driven by the continued high number of deaths involving heroin, a trend that began in late 2011, as well as the dramatic increase in the number of deaths involving illicit (clandestinely manufactured) fentanyl. Also significant is the increase in the number of deaths involving prescription opioids (e.g., hydrocodone, morphine and oxycodone), and benzodiazepines (e.g., alprazolam, clonazepam, diazepam) in 2014, compared to 2012. It is clear that the use of heroin and illicit fentanyl, along with the non-medical use of prescription opioids and benzodiazepines remains a very serious public health problem in Montgomery County that shows no signs of diminishing.

Finally, it is interesting to note there has been no change in the *proportion* of accidental drug overdose cases in which opiates (either heroin, illicit fentanyl or prescription opioids, or any combination) are involved. As indicated on page 3 of the attached *Poisoning Death Review Summary Report*, “Any Opiate (Heroin/Prescription Opioid/Illicit Fentanyl),” the occurrence of any opiate mention in accidental drug overdose deaths has hovered around 90% for the past 5 years. 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 2014 is an urgent public health problem that calls for collaborative intervention by the system of community partners.





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[2014 PDR Summary](#)