

Analysis of Overdose Deaths in Pennsylvania, 2016

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(U) This product was prepared by the DEA Philadelphia Division and the University of Pittsburgh. Comments and questions may be addressed to the Chief, Analysis and Production Section at dea.onsi@usdoj.gov. For media/press inquiries call (202) 307-7977.



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Executive Summary

The Commonwealth of Pennsylvania is in the midst of an unprecedented epidemic of drug abuse and drug-related overdose deaths impacting every corner of the state and all of its residents. In 2016, more than 4,600 Pennsylvanians died as a result of drug abuse, with thousands more affected by addiction, either personally, or through family, friends, and loved ones.

The collection, analysis, and dissemination of overdose death data contributes to a robust information sharing environment amongst the fields of law enforcement, public health, treatment, and public policy, all of whom are working together to address the drug crisis in Pennsylvania.

The analysis of drug-related overdose death data plays a pivotal role in law enforcement's efforts to identify and combat drug suppliers, and ultimately drug abuse and related overdoses. At the most basic level, the drugs that contribute to death are an indicator of drug availability in the user market. Analysis of this data also highlights geographic patterns of abuse and identifies at-risk populations, and when coupled with drug treatment statistics, law enforcement drug seizure data, and public health indicators, allows for multi-disciplinary data-driven decisions regarding resource placement and strategic initiatives.

In addition, disseminating the results of this analysis contributes to a robust information sharing environment amongst law enforcement,

public health, and public policy entities in support of our unified efforts to fight the scourge of drug abuse in Pennsylvania.

The coroners and medical examiners of Pennsylvania are critically important partners in the joint endeavors of the aforementioned stakeholders and are commended for their efforts in data collection and sharing, especially in light of the limited resources of personnel, equipment, and budgets that impact many.

The DEA Philadelphia Field Division requested assistance from the University of Pittsburgh, School of Pharmacy, Program Evaluation Research Unit (PERU), Technical Assistance Center (TAC), in analyzing this public health data. I extend my gratitude to PERU Director Dr. Janice Pringle, and the TAC, including Program Director Dr. Lynn Mirigian and Research Specialists Laken Ethun, Allison Burrell, Erin Straw, and Marco Pugliese, for their assistance in interpretation and visualization of the data. Through this collaboration, DEA is able to ensure the Commonwealth's stakeholders and citizens receive a professional and accurate analysis generated by experts in the law enforcement and public health fields.



Gary Tuggle
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Background

In 2008, the DEA Philadelphia Field Division (PFD) Intelligence Program initiated a data collection process in Philadelphia County to collect drug-related overdose death data. This collection process continued for several years, expanding to statewide collection of drug-related overdose death data from Pennsylvania's 67 counties in 2013; the PFD published statewide overdose death reports reflecting 2014 and 2015 data in 2015 and 2016, respectively. These reports were used by law enforcement to drive investigations into drug trafficking organizations (DTOs) and to identify trends in drug distribution and use. They also provided vital data for state and county law enforcement agencies, public health and treatment entities, and opioid overdose focused task forces to use in making informed decisions regarding resource allocations and to develop strategies to address the overdose epidemic.

In late 2016, the PFD requested the assistance of the University of Pittsburgh, School of Pharmacy, Program Evaluation Research Unit (PERU), Technical Assistance Center (TAC) in the analysis of Pennsylvania's drug-related overdose death data. The expertise of the TAC in the analysis and interpretation of public health data, which is outside the traditional scope of law enforcement intelligence analysis, resulted in the creation of this scientifically sound statewide overdose report that meets established standards for public health and law enforcement data analysis and production. This partnership is an example of the type of cross-disciplinary collaboration required to develop and implement effective strategies to combat the drug overdose crisis in Pennsylvania.

OverdoseFreePA (www.overdosefreepa.pitt.edu) is an interactive website developed, hosted, and maintained by the University of Pittsburgh, School of Pharmacy, PERU. OverdoseFreePA provides a variety of information related to the current crisis of opioid overdose and substance use disorder and is tailored to five audiences: friends and family, health professionals, public safety professionals, persons using opioids, and people in recovery.

The opioid overdose crisis in Pennsylvania and across the United States is a public health and public safety emergency.

Additionally, OverdoseFreePA works with 22 coroners and medical examiners across the Commonwealth to collect, standardize, analyze, and present drug-related overdose death information. Coroners and medical examiners who participate submit overdose death data directly to the website via an online form or bulk submission, where it is analyzed by public health personnel trained in standardizing toxicology test results using a protocol developed by Dr. Karl Williams, Medical Examiner of Allegheny County, Pennsylvania^{1,i}.

¹Full descriptions of the data standardization processes can be found at www.overdosefreepa.pitt.edu/datastandardization.

Key Findings

- ◆ In 2016, 4,642 drug-related overdose deaths were reported by Pennsylvania coroners and medical examiners, an increase of 37 percentⁱⁱ from 2015. In 2016, approximately 13 people died of a drug-related overdose each day.
- ◆ The Pennsylvania drug-related overdose death rate in 2016 was 36.5 per 100,000 people, an increase from 26.7ⁱⁱⁱ per 100,000 people in 2015. The national drug overdose death rate in 2015 was 16.3 per 100,000.²
- ◆ The presence of an opioid,^{iv} illicit or prescribed by a doctor, was identified in 85 percent of drug-related overdose deaths in Pennsylvania in 2016.
- ◆ Fentanyl and fentanyl-related substances^v (FRS) were the most frequently identified in decedents (52 percent of deaths), a significant increase from 2015 when fentanyl/FRS were noted in 27 percent of deaths. More than 95 percent of counties reporting drug-related overdose deaths in 2016 indicated the presence of fentanyl/FRS.
- ◆ Heroin was the second most frequently identified substance in decedents (45 percent of deaths), followed by benzodiazepines (33 percent of deaths), cocaine (27 percent of deaths), and prescription opioids (25 percent of deaths). Of counties reporting drug-related overdose deaths in 2016, 95 percent showed the presence of heroin.
- ◆ In 2016, individuals aged 15-24 saw a 380 percent increase in the presence of fentanyl in toxicology reports compared to other age groups. Conversely, individuals in the 25-34 age group experienced a 970 percent increase in instances of heroin present in toxicology reports compared to other age groups.
- ◆ The percent increase in drug-related overdose deaths between 2015 and 2016 was larger in rural counties (42 percent) compared to urban counties (34 percent).^{vi}
- ◆ In 2016, 70 percent of drug-related overdose decedents were male, consistent with 2015, but not consistent with the population distribution across Pennsylvania.
- ◆ Males were more likely to die from a fentanyl and/or heroin overdose compared to females. Females were more likely to have alprazolam, clonazepam, and/or oxycodone present in overdose deaths, while males were more likely to have fentanyl, heroin, cocaine, and/or ethanol present in overdose deaths.
- ◆ In 2016, 77 percent of decedents were White, 12 percent were Black, 4 percent were Hispanic, and 7 percent were identified as Other, consistent with 2015 and the population distribution across Pennsylvania.
- ◆ Finally, the continued lack of standardized and centralized reporting of drug-related overdose death data in Pennsylvania inhibits timely analysis necessary for stakeholders to drive decision-making. Efforts must continue amongst the myriad data collectors to streamline compilation and develop a common mechanism for information sharing that serves the public interest.

ⁱⁱCorrected value of 3,376 for 2015 drug-related overdose deaths in Pennsylvania

ⁱⁱⁱAdjusted based on updated overdose death counts from 2015.

^{iv}See Figure 1 for list of opioids included in this analysis

^vSee Figure 1 for list of fentanyl-related substances (FRS) included this analysis

^{vi}See Appendix Table 1 for list of urban and rural counties

Methodology

The PFD requested information on drug-related overdose deaths from Pennsylvania's coroners and medical examiners for 2016, to include the following data points:

- ◆ Coroner Name and Reporting County
- ◆ Death date and time
- ◆ Manner of death (ex. accidental, undetermined, suicide)
- ◆ Demographic information (ex. age, gender, race)
- ◆ Incident and Resident Zip Code^{vii}
- ◆ Drugs found in toxicology report

For this report, only drug-related overdose deaths ruled accidental or undetermined (if provided and toxicology was present) were analyzed.^{viii} Suicides were excluded due to previous studies demonstrating the toxicology, demographic information, genetic predisposition, and other factors of suicide decedents are dissimilar to those of accidental overdose.³ The PFD received data on 4,642 accidental or undetermined drug-related overdose deaths from 64 counties in Pennsylvania.

The data collection process varied by county and included submissions directly to the PFD, as well as to TAC via OverdoseFreePA. Data submitted directly to TAC was shared with the PFD upon request and with agreement from the submitting coroner or medical examiner. Counties that do not participate on OverdoseFreePA shared information with the PFD directly.

The data request for 2016 overdose deaths was made in April 2017; therefore, it is possible that

additional deaths were finalized by coroners/medical examiners after that date, and were not included in the county and statewide totals. While collecting and verifying overdose related information for the 2016 report, data from 2015 was simultaneously verified with coroner and medical examiner offices. The total number of drug-related overdose deaths in 2015 was adjusted to 3,376 (previously reported as 3,383).

With the assistance of the TAC, death data was standardized in accordance with the aforementioned protocol to determine drug and metabolite relationships. Once standardization was complete, drugs of interest (see Figure 1) were selected for analysis based on law enforcement intelligence regarding frequency of abuse and diversion, as well as those identified as the most common drugs present in drug-related overdose deaths by national public safety and public health sources. Drugs of interest present in toxicology reports were combined into the following categories described in Figure 1.

In addition, ethanol was analyzed as a separate category in the demographic analysis of drug-related overdose deaths due to its propensity to exacerbate the effects of other drugs when used in combination.⁴ Methadone and buprenorphine were analyzed and reported independently from other drug categories in the statewide toxicology analysis due to differences in supply, availability and use patterns when compared to other drug categories.

For the full description of each drug and its corresponding placement in the Controlled

^{vii}Only 34.8 percent of the death data included zip code, therefore, further analysis was not conducted due to lack of representative data.

^{viii}Except for Lycoming County, where deaths ruled as homicides were included in the data set per the Coroner's decision detailed in "Heroin Overdoses will now be considered homicides," PennLive, March 23, 2016.

Substances Act (CSA), please see Appendix Table 3. Due to lack of available data (see Data Challenges section for more information), synthetic cathinones, synthetic cannabinoids, and marijuana were not included in this analysis.

Rates were calculated to allow the number of overdose deaths to be compared in relation to the population size of each county. Across all analyses, rates were determined using the 2010 U.S. Decennial Census.⁵ Across all analyses, rates were determined using the 2010 U.S. Decennial Census. The following formula was used to calculate county-specific and state-level rates throughout the analysis:

$$\text{Rate} = \frac{(\text{Number of drug related deaths})}{(\text{Population within county})} \times 100,000 \text{ people}$$

Urban and rural rates were calculated using the following population adjusted rate formula:

$$\text{Rate} = \frac{(\text{Number of drug related deaths})}{(\text{Sum of Population of Rural or Urban Designated Counties})} \times 100,000 \text{ people}$$

At the PFD's request, the TAC used logistical regression modeling to measure the effect of age, race, and gender on fentanyl and heroin deaths. The logistic regression models shown here can be utilized as predictive measures, in that they predict the odds of a heroin or fentanyl death based on three dependent variables: gender, age, and race. Eight age groups (Young: 0-14, 15-24, and 25-34; Middle Aged: 35-44, 45-54; and Older: 55-64, 65-74, 75+), five racial groups (Black, White, Hispanic, Other, and Unknown), and two genders (male and female), were used for the analysis to determine statistical significance.

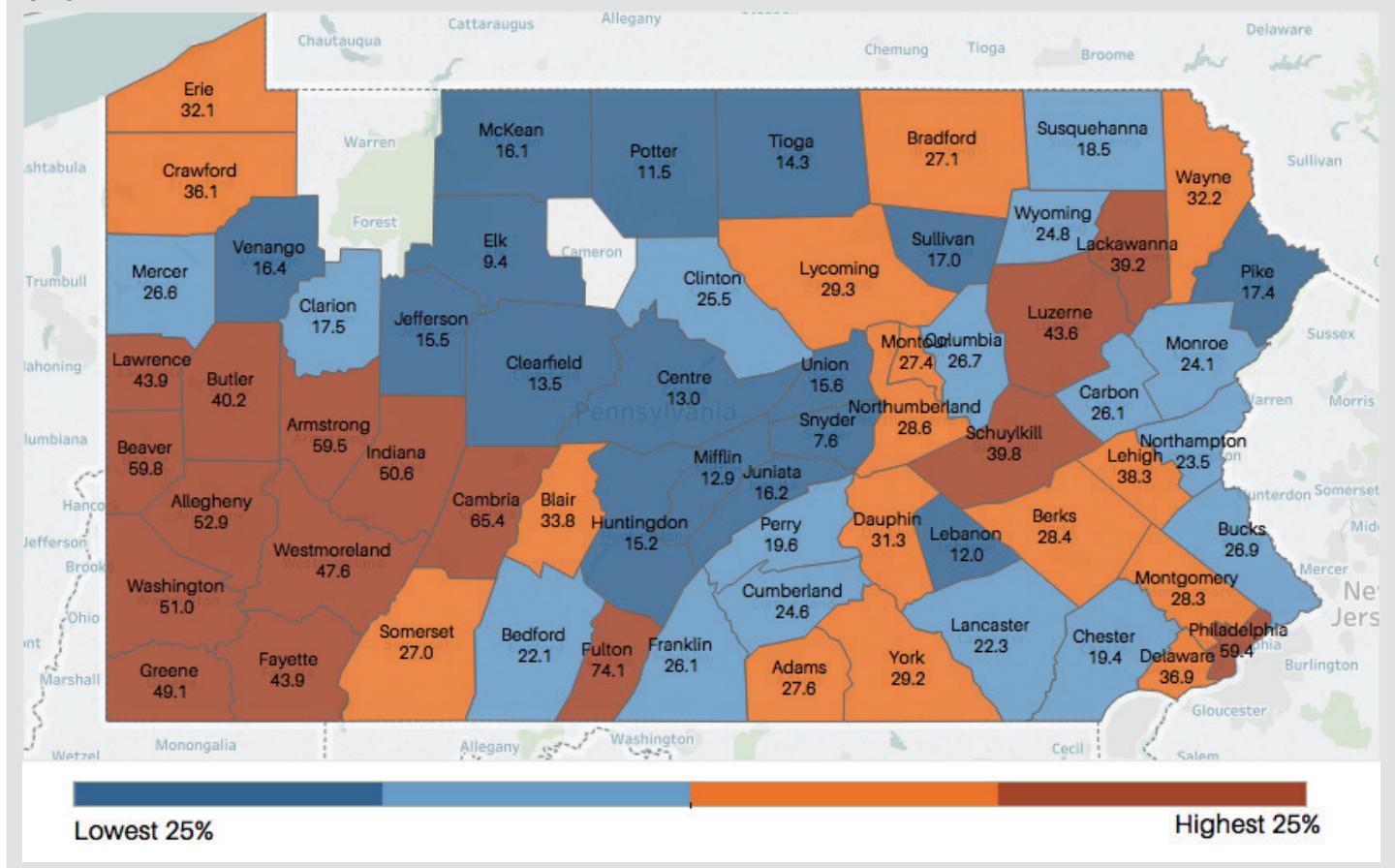
(U) Figure 1: Drugs Included in Analysis of Drug-Related Overdose Deaths, Pennsylvania, 2016

Drug Category	Substances Included in Analysis			
Benzodiazepines	Alprazolam Chlordiazepoxide Clonazepam Delorazepam	Diazepam Estazolam Flurazepam Lorazepam	Midazolam® Oxazepam Temazepam	
Cocaine				
Fentanyl/Fentanyl-Related Substances (FRS)/Non-Prescription Synthetic Opioids (NPSOs)	3-Methylfentanyl 4-Methoxy-Butyryl Fentanyl Acetyl Fentanyl Acryl Fentanyl	Carfentanil Fentanyl Fluorobutyrfentanyl Fluorofentanyl	Furanyl Fentanyl Para-Fluoro-Isobutyryl Fentanyl/FIBF Sufentanil U-47700	
Heroin				
Other Illicit Drugs	Lysergic Acid Diethylamide (LSD) Methylenedioxymethamphetamine (MDMA) 3,4-Methylenedioxymethamphetamine (MDMA)		Methamphetamine Phencyclidine (PCP)	
Prescription Opioids	Hydrocodone Hydromorphone Meperidine	Morphine Oxycodone Oxymorphone	Tapentadol Tramadol	

Source: DEA Philadelphia Field Division

Data Overview

(U) Figure 2: Rate of Drug-Related Overdose Deaths per 100,000 people in Pennsylvania Counties, 2016



Source: Pennsylvania Coroner/Medical Examiner Data

In 2016, Pennsylvania coroners and medical examiners reported 4,642 drug-related overdose deaths. The rate of drug-related overdose deaths in Pennsylvania increased from 26.7^{ix} per 100,000 in 2015 to 36.5 per 100,000 in 2016, far exceeding the national average (16.3 per 100,000)⁶. Among individual counties, rates ranged from 0.00 to 74.10 per 100,000 people. Figure 2 depicts the counties in the highest 25 percent, upper 25-50 percent, lower 25-50 percent, and lowest 25 percent with regard to overdose rates per 100,000 people. A full listing of county rankings from highest overdose rate to lowest can be found in Table 1.

Philadelphia County dropped in rank from first to fifth in rate of overdose deaths, despite a 26 percent increase in the raw number of overdose deaths; 2016 is the first year of this reporting that Philadelphia did not rank first among the Pennsylvania counties in the rate of overdose deaths.

The drug-related overdose death rate in Pennsylvania in 2016 is 36.5 persons per 100,000.

^{ix}Adjusted based on updated overdose death counts from 2015.

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(U) Table 1: Ranking of the Rate of Drug-Related Overdose Deaths per 100,000 People in Pennsylvania Counties, 2015 and 2016

2016 Rank	2015 Rank	County	2016 Rate	2016 Rank	2015 Rank	County	2016 Rate
1	32	Fulton	74.1	35	46	Mercer	26.6
2	3	Cambria	65.4	36	49	Franklin	26.1
3	29	Beaver	59.8	37	19	Carbon	26.1
4	5	Armstrong	59.5	38	55	Clinton	25.5
5	1	Philadelphia	59.4	39	23	Wyoming	24.8
6	10	Allegheny	52.9	40	39	Cumberland	24.6
7	9	Washington	51.0	41	25	Monroe	24.1
8	4	Indiana	50.6	42	26	Northampton	23.5
9	6	Greene	49.1	43	47	Lancaster	22.3
10	11	Westmoreland	47.6	44	53	Bedford	22.1
11	17	Fayette	43.9	45	61	Perry	19.6
12	12	Lawrence	43.9	46	51	Chester	19.4
13	18	Luzerne	43.6	47	50	Susquehanna	18.5
14	21	Butler	40.2	48	56	Clarion	17.5
15	42	Schuylkill	39.8	49	52	Pike	17.4
16	14	Lackawanna	39.2	50	33	Venango	16.4
17	13	Lehigh	38.3	51	64	Juniata	16.2
18	7	Delaware	36.9	52	36	McKean	16.1
19	15	Crawford	36.1	53	63	Union	15.6
20	40	Blair	33.8	54	45	Sullivan	15.6
21	8	Wayne	32.2	55	37	Jefferson	15.5
22	24	Erie	32.1	56	38	Huntingdon	15.2
23	16	Dauphin	31.3	57	59	Tioga	14.3
24	30	Lycoming	29.3	58	44	Clearfield	13.5
25	28	York	29.2	59	57	Centre	13.0
26	34	Montgomery	28.8	60	54	Mifflin	12.9
27	41	Northumber- land	28.6	61	48	Lebanon	12.0
28	43	Berks	28.4	62	62	Potter	11.5
29	60	Adams	27.6	63	58	Elk	9.4
30	2	Montour	27.4	64	65	Snyder	7.6
31	22	Bradford	27.1	65	66	Cameron	0.0
32	31	Somerset	27.0	65	20	Forest	0.0
33	35	Bucks	26.9	65	66	Warren	0.0
34	27	Columbia	26.7				

Source: Pennsylvania Coroner/Medical Examiner Data

Data Overview

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Within the top 10 counties, the distribution of rural and urban counties was similar to 2015; six rural counties were ranked in the top 10 in 2016, compared to seven in 2015. Of note, 78 percent of counties that reported an overdose death in 2016 had rates per 100,000 people that exceeded the national average.

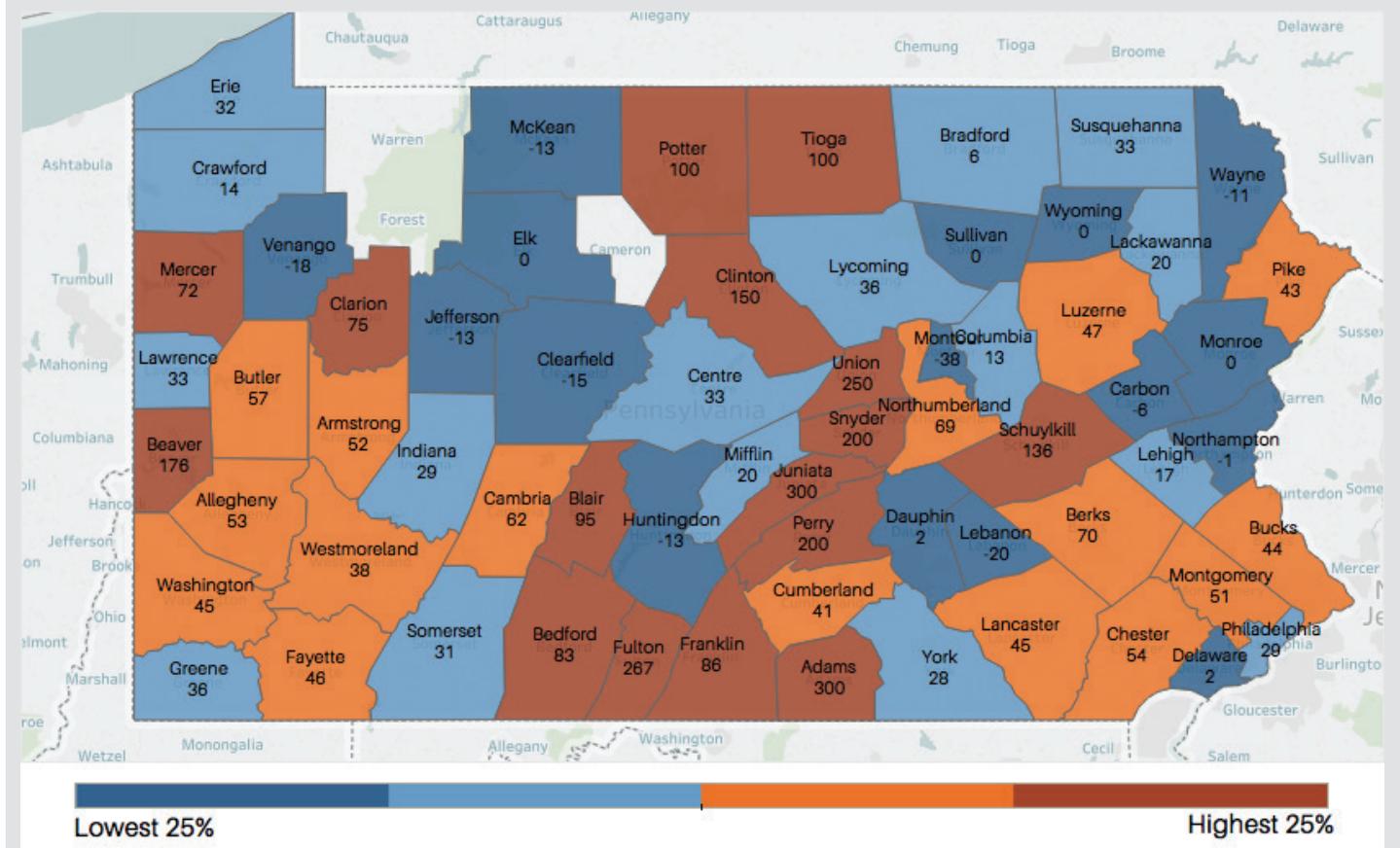
Between 2015 and 2016, there was a 37 percent increase in the number of drug-related overdose deaths in Pennsylvania. The change in deaths (percent) from 2015 to 2016 varied across the counties and ranged from a 37.5 percent decrease to a 300 percent increase. Figure 3 depicts the counties in the highest 25 percent, upper 25-50 percent, lower 25-50 percent, and

lowest 25 percent of percent change from 2015 to 2016. In 2016, the number of drug-related

78 percent of Pennsylvania Counties had overdose death rates higher than the national average.

overdose deaths increased in 53 counties (79 percent), compared to 14 counties (21 percent) where there was a decrease or no change in the number of overdose deaths. There was a larger percent increase (42 percent) in the number of drug-related overdose deaths in rural counties than urban counties (34 percent) from 2015 to 2016.

(U) Figure 3: Percent Change in Drug-Related Overdose Deaths in Pennsylvania Counties, 2015-2016



Comparison between 2015 and 2016 Drug-Related Overdose Deaths

In 2016, the number of drug-related overdose deaths increased among each of the identified drug categories from 2015 (see Table 2). Fentanyl/FRS/NPSOs demonstrated the largest increase (130 percent). Heroin, the most frequently reported drug in 2015, increased 23 percent from 2015 to 2016. In order to allow for cross year comparison, morphine was attributed

Fentanyl/FRS/NPSOs increased 130 percent from 2015 to 2016.

to heroin, not prescription opioids, in this section of the report.^{x1} However, in the remainder of the report, morphine was attributed to prescription opioids pursuant to the toxicology standardization protocol named earlier.

Although the category of Other Illicit Drugs increased by 56 percent from 2015 to 2016, the drugs contained within the category were

(U) Table 2: Frequency of Drug Categories and Rate of Change in Drug-Related Overdose Decedents, Pennsylvania, 2015-2016

Drug Category	Percent Reported Among 2016 Decedents	Percent Change from 2015-2016
Fentanyl/FRS/NPSOs	51.6	130
Other Illicit Drugs	5.5	56
Cocaine	27.0	33
Benzodiazepines	33.2	29
Heroin	45.0	23
Prescription Opioids	25.0	3

Source: Pennsylvania Coroner/Medical Examiner Data

represented in only 5.5 percent of deaths in 2016. Methamphetamine saw the largest increase from 2015 to 2016 but remained present in low levels when compared to other drugs.

Toxicology Overview

Within toxicology reports of the 2016 drug-related overdose deaths, 208 different drugs were identified. Of the 4,642 drug-related overdose deaths, 83.5 percent contained two or more drugs, 40 percent contained four or more drugs, and 12.5 percent contained six or more drugs in the associated toxicology reports.

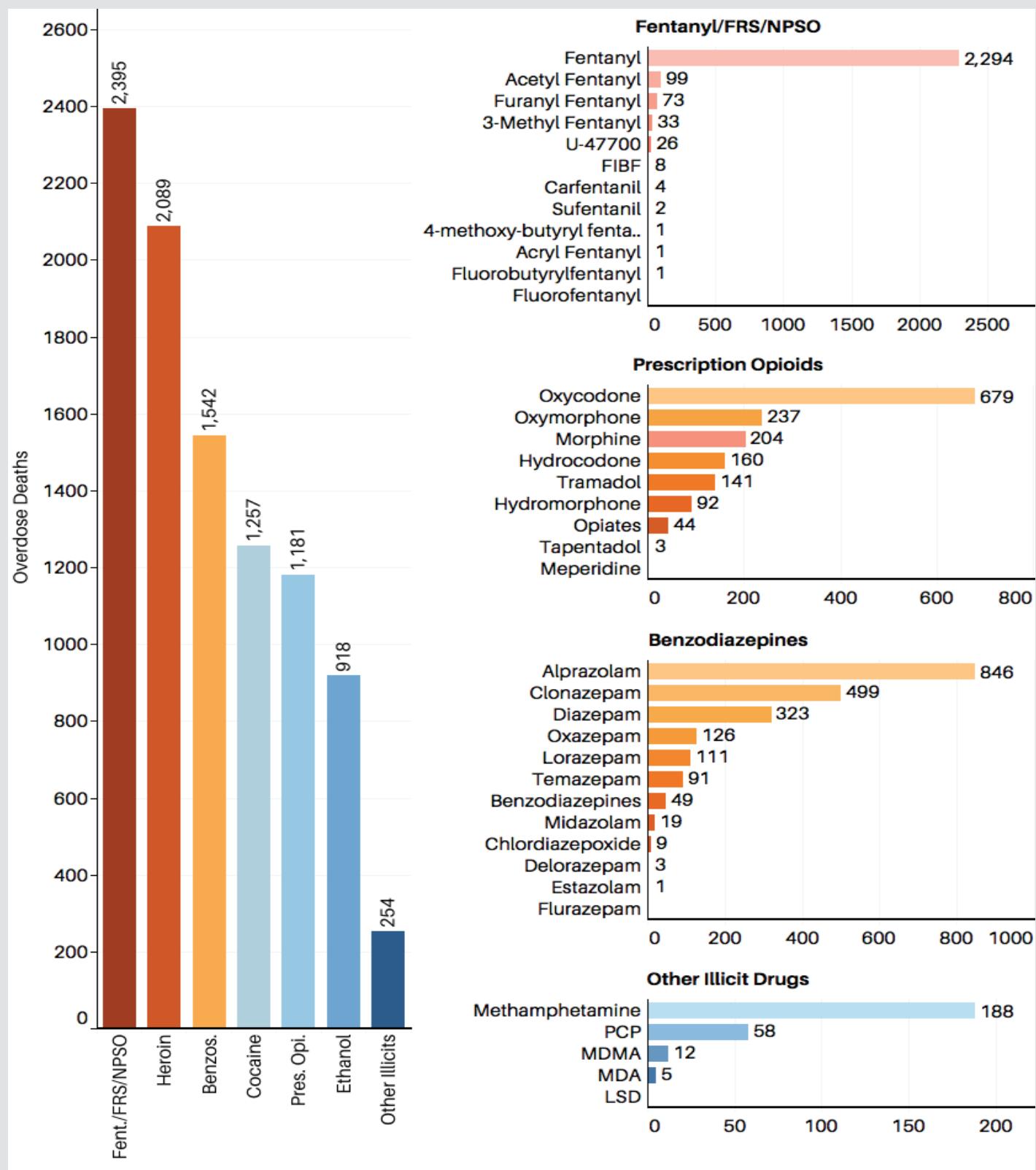
Figure 4 demonstrates the presence of each analyzed substance in the dataset.

208 different drugs were identified in 2016 drug-related overdose deaths.

When the drugs were narrowed by category of interest, fentanyl/FRS/NPSOs were observed in more than half of the decedents (52 percent). Heroin, the most identified drug in 2015, was second most prevalent in 2016 (45 percent). Benzodiazepines, which included 11 individual substances, were the third most prevalent (33 percent), followed by cocaine (27 percent). Prescription opioids, which included eight individual substances, were observed in 25 percent of decedents, followed by ethanol in 20 percent, and other illicit drugs were present in 5.5 percent.

^{x1}The methodology used for the 2015 statewide overdose report attributed all morphine to heroin.

(U) Figure 4: Number of Drug-Related Overdose Deaths by Drug Presence, Pennsylvania, 2016



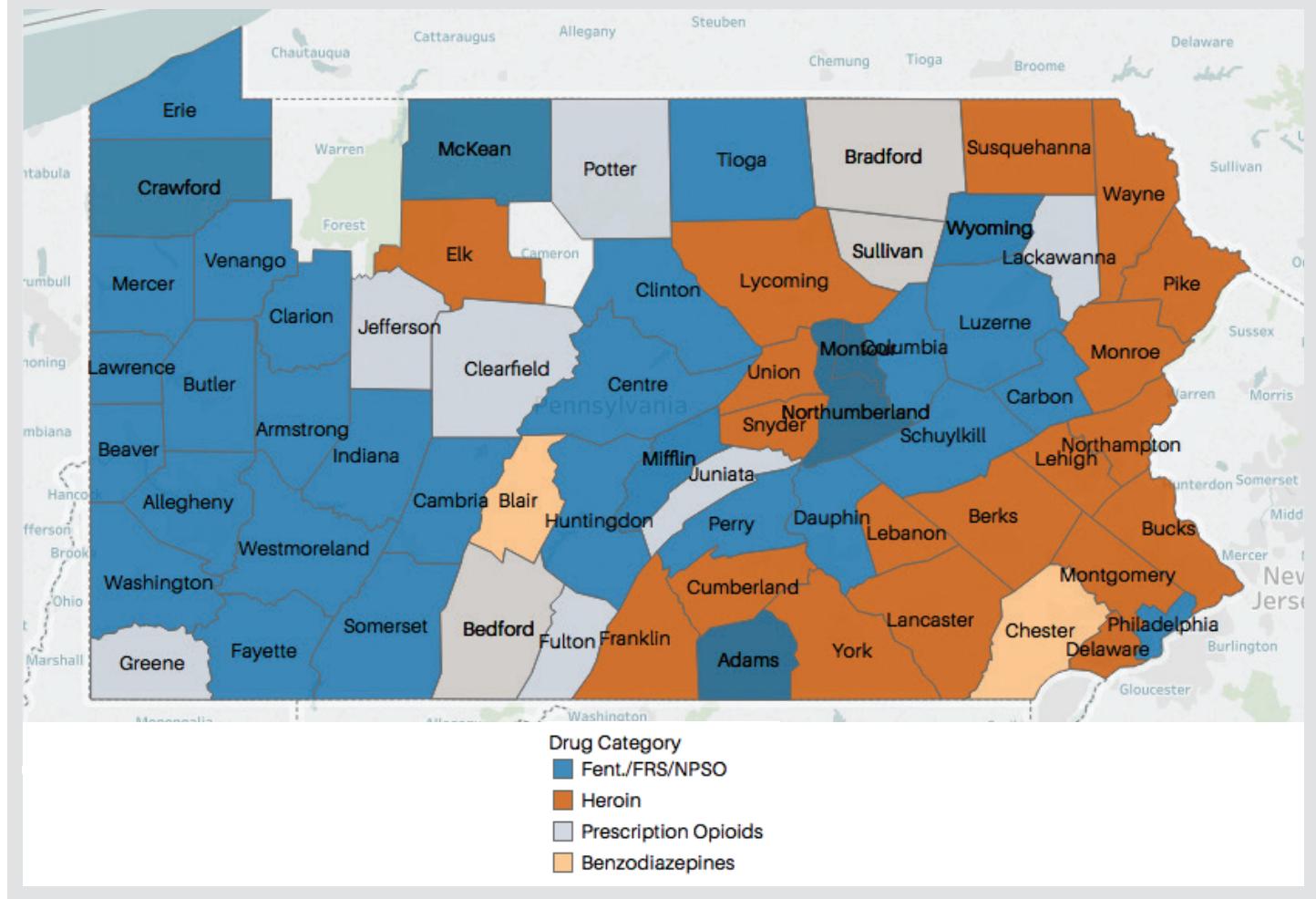
Source: Pennsylvania Coroner/Medical Examiner Data

Toxicology Trends by County

In 2016, the most commonly identified drug category in toxicology reports varied for counties across Pennsylvania (see Figure 5). Fentanyl/FRS/NPSOs and heroin were the first and second most common drug categories, respectively, in both urban and rural counties. The third most common drug category in rural counties was prescription opioids, and in urban counties it was benzodiazepines.

Overall, fentanyl/FRS/NPSOs were the most common substances in 33 counties that reported a drug-related overdose death. Geographic analysis revealed a large concentration of western Pennsylvania counties ranking fentanyl/FRS/NPSOs as the leading cause of overdose death, while eastern Pennsylvania counties continued a high presence of heroin. Ten counties demonstrated a tie for most prevalent drug category. In these instances, the drug category displayed was ranked in order of fentanyl/FRS/NPSOs, heroin, prescription opioids, and benzodiazepines.

(U) Figure 5: Most Frequently Reported Drug Category in Drug-Related Overdose Decedents by Pennsylvania County, 2016



Source: Pennsylvania Coroner/Medical Examiner Data

Toxicology Trends by Time

The percentage of drug-related overdose deaths was calculated each month by drug category (see Figure 6). The presence of fentanyl/FRS/NPSOs in overdose deaths was relatively low at the beginning of 2016 (32 percent presence in all January overdose deaths). The percentage increased steadily throughout 2016 until it was present in 73 percent of all December overdose deaths.

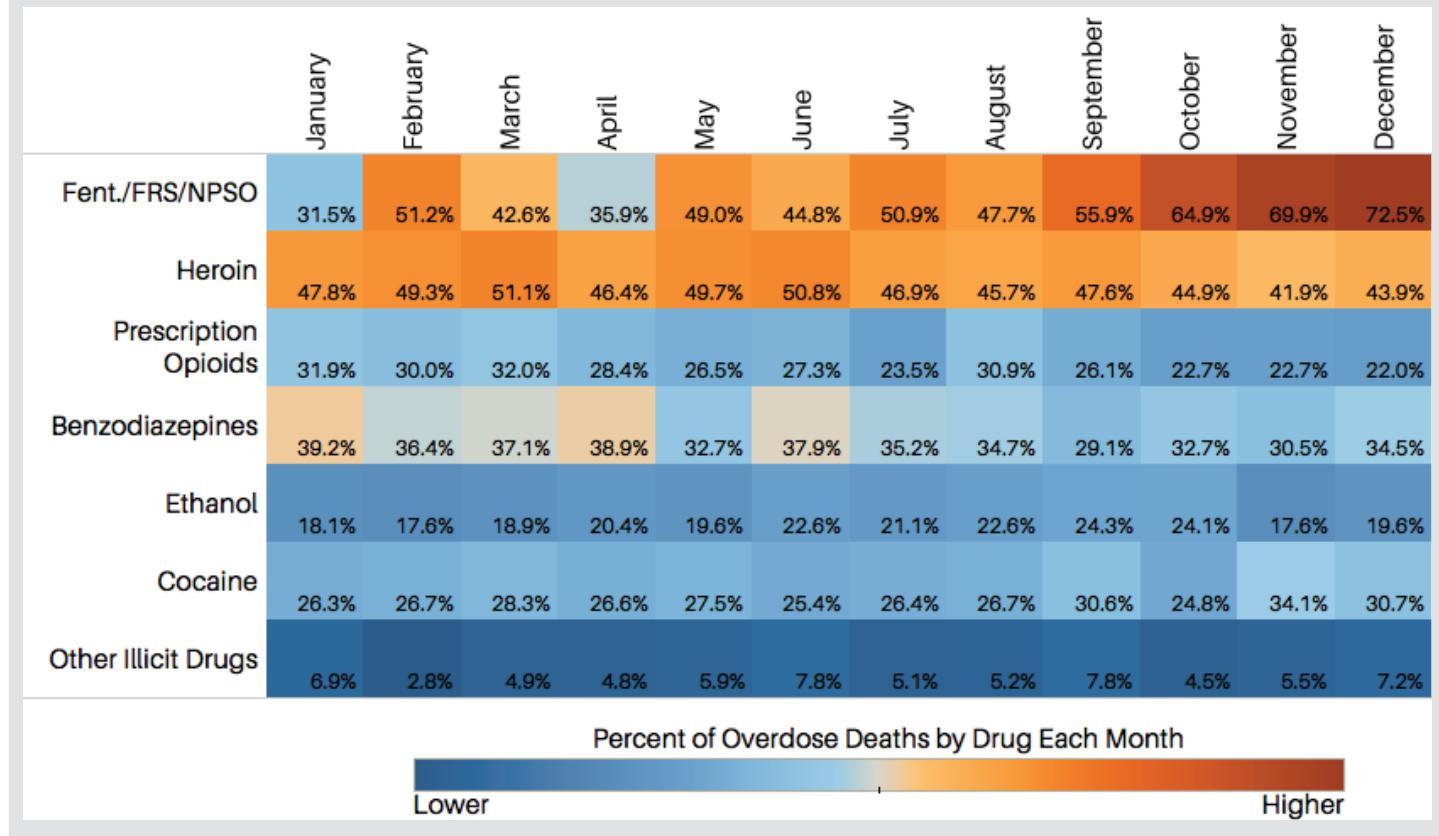
Fentanyl/FRS/NPSOs availability and use in Pennsylvania increased throughout 2016, both in the amount and variety of substances available. DTOs supplied increasing amounts of fentanyl to Pennsylvania opioid markets, and a wider variety of FRS/NPSOs were introduced by both traffickers and individuals ordering substances online.

This increase is in contrast to heroin, which remained steady across all months (42-51 percent of overdose deaths each month) and prescription opioids, which declined from January (32 percent) to December (22 percent).

Fentanyl was present in 73 percent of overdose deaths in December compared to 32 percent in January.

The presence of benzodiazepines in overdose deaths remained consistent throughout the year, ranging from 39 percent in January to 34 percent in December. The presence of ethanol and cocaine remained steady through the year, ranging from 18 to 20 percent and 26 to 34 percent, respectively.

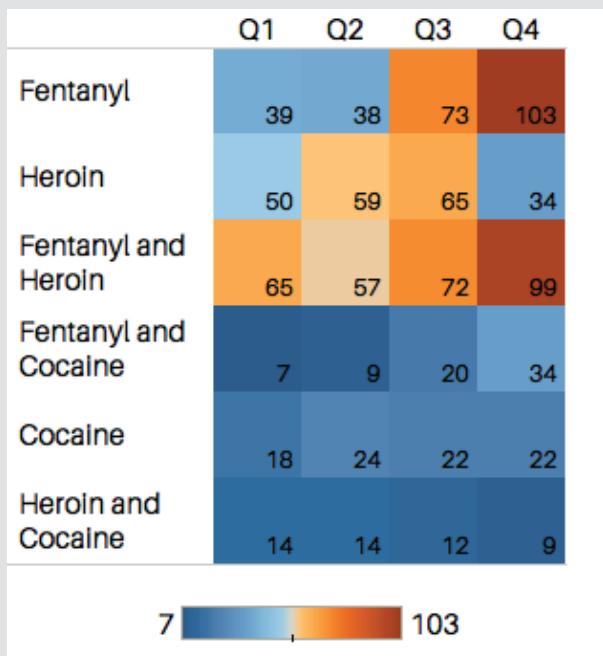
(U) Figure 6: Percent of Drug-Related Overdose Deaths by Drug and Month, Pennsylvania, 2016



Source: Pennsylvania Coroner/Medical Examiner Data

When identifying drug-related overdose deaths where only one or two analyzed drugs were present in toxicology, nearly half of these cases (47 percent) contained fentanyl, heroin, and/or cocaine (see Figure 7). Decedents with toxicology reports containing only cocaine remained relatively consistent each quarter of 2016 (18-24 counts per quarter). With regards to heroin and fentanyl, decedents with positive toxicology reports changed through the year. While the number of fentanyl-only deaths rose from 39 in the first quarter to 103 in the last quarter of 2016, the number of heroin-only deaths decreased from 50 in the first quarter to 34 in the last quarter of 2016. Analyzed together with information from Figure 6, the data demonstrates a shift during the fourth quarter of 2016 from heroin to fentanyl being the most common drug reported.

(U) Figure 7: Drug-Related Overdose Deaths Where Only One or Two Analyzed Drugs Were Present in Toxicology



This change is a significant indicator of Pennsylvania opioid use possibly shifting from primarily heroin to primarily fentanyl/FRS. However, it is important to note that a higher number of fentanyl-related deaths alone is not confirmation of this shift.

The potency of fentanyl can result in a much higher rate of overdose death than heroin.

Because fentanyl is so potent, it can cause a much higher rate of overdose death than heroin, despite lower user rates. Additional indicators reported by law enforcement indicate that users are now seeking out fentanyl instead of unknowingly purchasing fentanyl disguised as heroin, and street-level traffickers are openly marketing fentanyl to customers instead of disguising it as heroin.⁷ It is likely that traffickers will continue to aggressively distribute fentanyl/FRS in the local opioid markets, whether openly or clandestinely, because fentanyl is less expensive to produce and acquire than heroin.⁸

Toxicology Trends by Drug Category

Benzodiazepines

Benzodiazepines were present in 33 percent of toxicology reports, and in 93.8 percent of reporting counties. Alprazolam was reported most frequently within this category. The counties with the highest rate of alprazolam per 100,000 people were Philadelphia (16.9), Wyoming (10.6), Beaver (10.5), Armstrong (10.1), and Allegheny (10.1), in rank order. Other drugs present with alprazolam in toxicology reports included fentanyl (49 percent), heroin (49 percent), cocaine (29 percent) and oxycodone (25 percent). Ethanol usage, in combination with benzodiazepines and/or prescription opioids, increases overdose risk⁹, and was found with alprazolam in 16 percent of toxicology reports.

Toxicology

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Cocaine

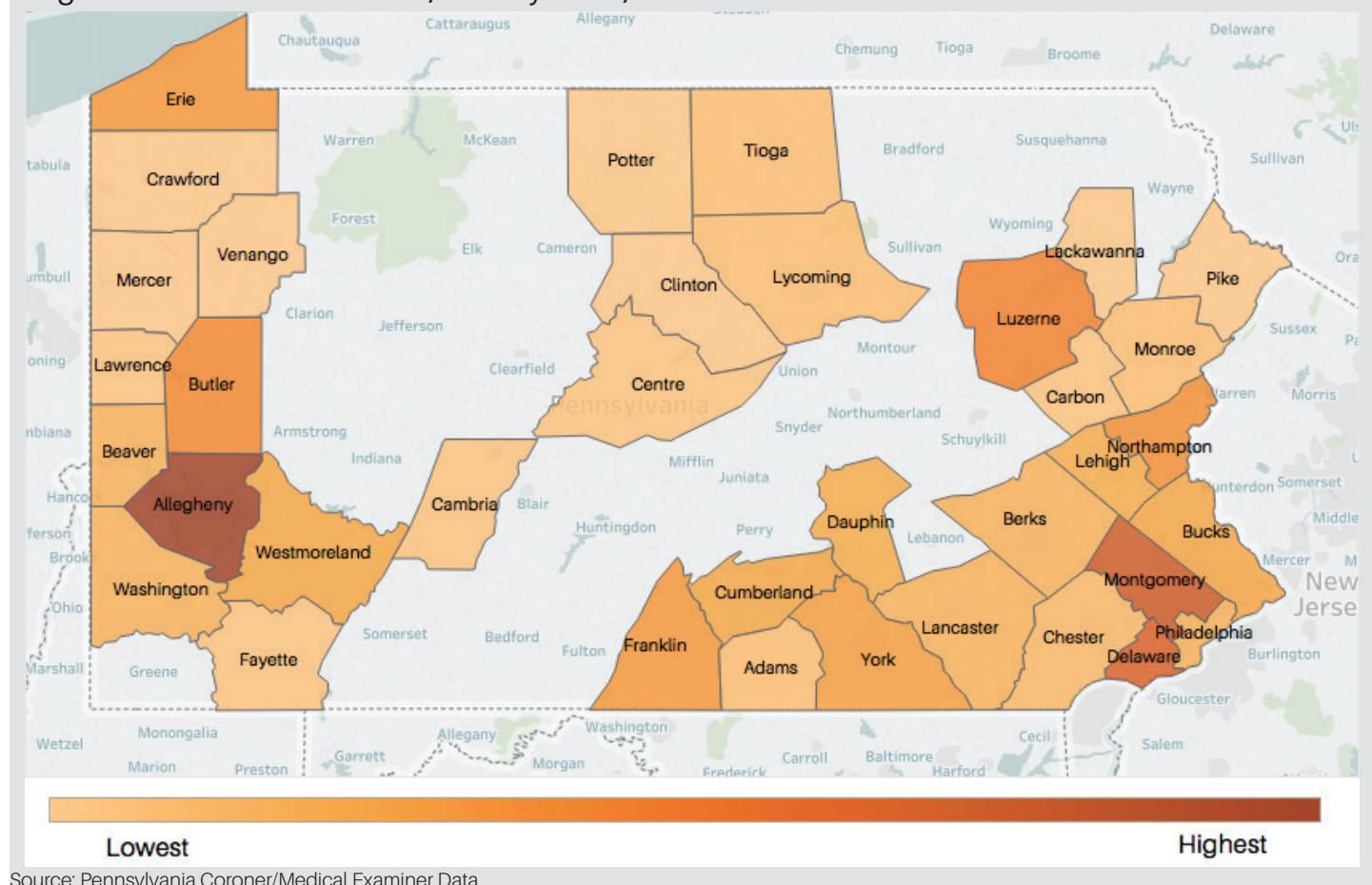
The presence of cocaine was noted in 82.8 percent of counties reporting an overdose death in 2016. Cocaine-related overdose deaths increased 33 percent from 2015 to 2016 after a 40 percent increase from 2014 to 2015. Law enforcement sources indicate the production of cocaine in source locations is increasing and will directly impact local and regional availability through established illicit drug supply mechanisms.¹⁰ Local law enforcement sources indicate DTOs selling heroin are increasingly switching to cocaine distribution due to the fear of law enforcement prosecution for deaths resulting from heroin and fentanyl sales. Geographically, the presence of cocaine was

concentrated in the two largest metropolitan areas (Philadelphia and Pittsburgh), which accounted for 78 percent of cocaine-related overdose deaths when combined. Cocaine was most often found in combination with heroin, ethanol, and levamisole. Levamisole is an anti-parasitic drug currently approved for use in the United States by veterinarians, and is a common cocaine adulterant.¹¹

Fentanyl, Fentanyl Related Substances (FRS), and Non-Prescription Synthetic Opioids (NPSOs)

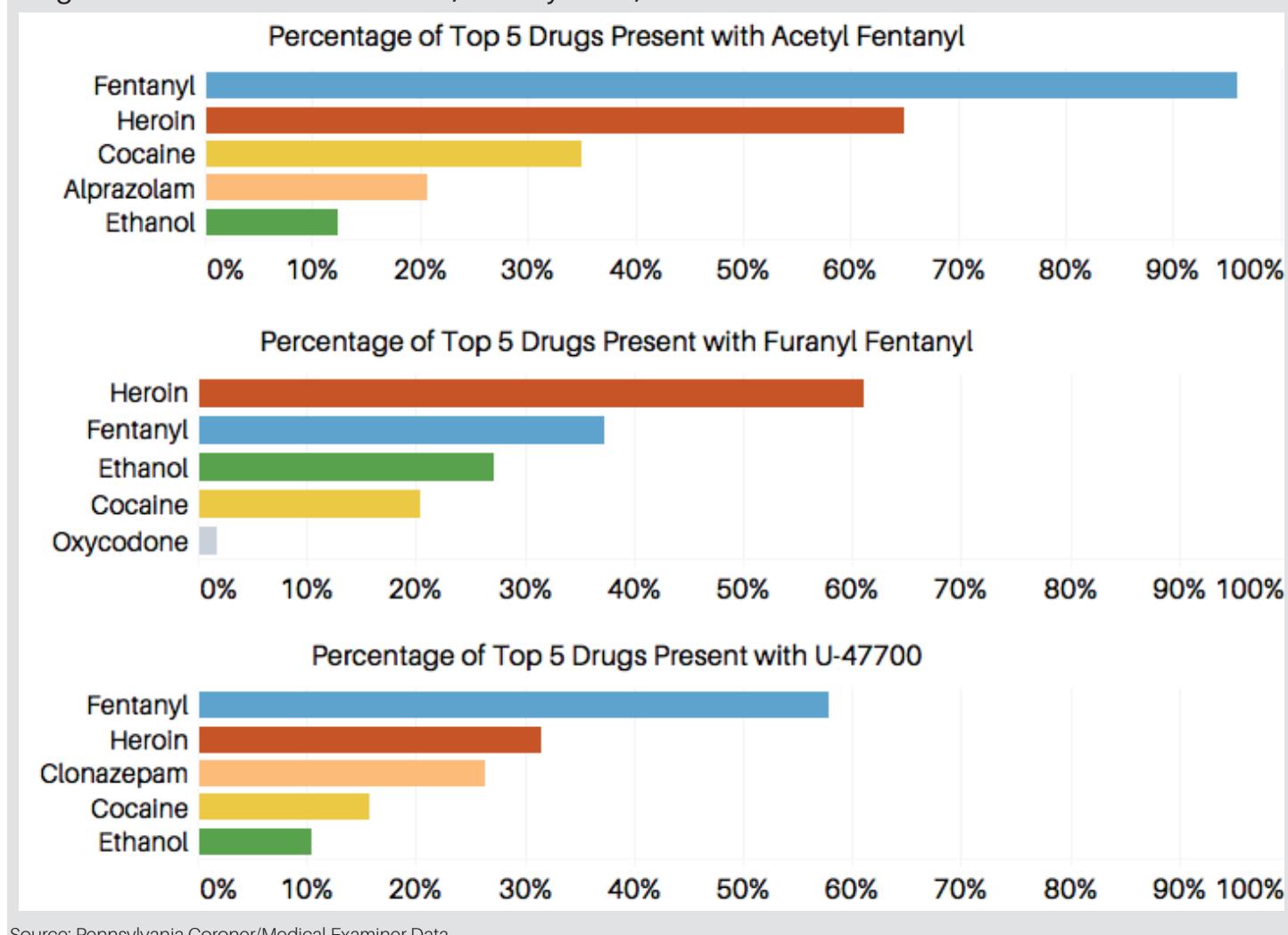
Fentanyl/FRS/NPSOs emerged as the most frequently reported drug category in overdose deaths in 2016. When analyzed separately,

(U) Figure 8: Presence of Fentanyl Related Substances and Non-Prescription Synthetic Opioids in Drug-Related Overdose Deaths, Pennsylvania, 2016



Source: Pennsylvania Coroner/Medical Examiner Data

(U) Figure 9: Drugs Found in Combination with Acetyl Fentanyl, Furanyl Fentanyl, and U-47700 in Drug-Related Overdose Decedents, Pennsylvania, 2016



Source: Pennsylvania Coroner/Medical Examiner Data

fentanyl was found in 61 of the 64 counties that reported an overdose in 2016, with Beaver (43.9), Allegheny (33.4), Cambria (33.4), Westmoreland (29.8), and Washington (29.8) counties having the highest rate of fentanyl presence per 100,000 people. Fentanyl was found in combination with heroin (64 percent), cocaine (34 percent), ethanol (22 percent), and alprazolam (21 percent) most frequently.

Nine out of 10 fentanyl-related substances found in toxicology reports from 2016 overdose deaths were not reported in 2015. The number of

toxicology reports that mentioned FRS increased from 119 in 2015 to 221 in 2016, an increase of 86 percent. In addition to the increase in FRS, the presence of U-47700, an NPSO, was identified for the first time in 2016. With the rapid expansion in the production and distribution of FRS/NPSOs, many tests have not been developed or added to toxicology panels, thus the numbers herein are likely not representative across counties (see Data Challenges section for more information). However, 10 FRS/NPSOs were identified in toxicology reports of drug-related overdose decedents, with an asterisk

Toxicology

(*) denoting a new compound not previously reported:

- 3-Methylfentanyl*
- Fluorofentanyl*
- 4-Methoxy-Butyryl Fentanyl*
- Fluorobutyrfentanyl*
- Acetyl Fentanyl
- Furanyl Fentanyl*
- Acryl Fentanyl*
- Para-Fluoro-Isobutyryl-Fentanyl/FIBF*
- Carfentanil*
- U-47700*
- Sufentanil*

Thirty-six counties reported the presence of FRS/NPSOs in drug-related overdose deaths (see Figure 8). While the greatest presence was concentrated in counties near major urban centers, where the largest number of opioid users are located, FRS/NPSOs were reported throughout the state, to include many rural counties. The percentage of rural counties with a FRS/NPSOs present (25 percent) was slightly higher than the percentage of all drug-related overdose deaths in rural counties (23 percent). This is an indication of the widespread availability of FRS/NPSOs in Pennsylvania due to the ease of obtaining FRS/NPSOs from online sources.

To understand the drugs commonly found with FRS and U-47700, the two most prevalent FRS compounds (acetyl fentanyl and furanyl fentanyl, which comprise 77 percent of FRS) and U-47700 were analyzed more closely (see Figure 9). The first and second most common drug for each of the three compounds was either fentanyl or heroin. Interestingly, acetyl fentanyl was almost always found with fentanyl (96 percent).

No other drug combination was found so frequently amongst all illicit drugs including

FRS, NPSOs, heroin, methamphetamine, and cocaine.

China is the primary source for FRS/NPSOs abused in the United States. Traffickers and users typically purchase these chemicals online and receive them through mail services. The Chinese government recently acted to control many FRS and NPSOs. For example, in October 2015, acetyl fentanyl and fluorobutyrfentanyl were among 116 substances newly controlled, while China controlled acryl fentanyl, carfentanil, and furanyl fentanyl beginning in March 2017.

China is the primary source for FRS/NPSOs abused in the United States.

In June 2017, China announced it will control U-47700 effective July 1, 2017. As substances are controlled in China or scheduled in the United States, illicit manufacturers makes small structural modifications and create a new substance, with similar opioid properties, that is not named under the Controlled Substances Act. These new substances may be treated under the federal analogue provision if intended for human consumption. The rapid introduction of new substances is challenging for toxicologists.¹²⁻¹³ The phenomenon is likely the cause of the increased variety of FRS/NPSOs available in Pennsylvania during 2016.

Heroin

Heroin was the second most frequently reported drug in toxicology tests of drug-related overdose decedents in 2016. Heroin was present in 95.3 percent of counties that reported an overdose death in 2016. The counties with the highest rate of heroin per 100,000 people were Fulton (33.6), Allegheny (26.9), Westmoreland (25.7),

Washington (22.6), and Beaver (21.7). Heroin was found most often in combination with fentanyl (68 percent), cocaine (32 percent), alprazolam (22 percent), and ethanol (21 percent).

Other Illicit Drugs

The presence of other illicit drugs, to include methamphetamine, PCP, MDMA, MDA, and LSD remained low in the overdose dataset. Methamphetamine had the largest presence within this category, but was only present in 4 percent of decedents. The presence of methamphetamine increased slightly from 3.1 percent in 2015. Geographically, methamphetamine was concentrated in eastern Pennsylvania, with the highest number in Philadelphia (33), Schuylkill (20), and Bucks (17) Counties. Methamphetamine was found most often in combination with fentanyl, heroin, cocaine, and alprazolam. PCP presence was noted in only 55 deaths, with 78 percent of these deaths located in Philadelphia County.

Prescription Opioids

Prescription opioids were present in 25 percent of toxicology reports, and 95.3 percent of reporting counties. Oxycodone was reported most frequently within this category. The counties with the highest rate of oxycodone references per 100,000 people were Fulton (40.42), Cambria (13.2), Schuylkill (10.7), Wyoming (10.6), and Lawrence (9.8), in rank order. Other drugs present with oxycodone in toxicology reports included fentanyl (31 percent), alprazolam (30 percent), heroin (26 percent), and ethanol (20 percent).

Compared to all other analyzed drug categories, overdose deaths with the presence of prescription opioids demonstrated the smallest increase throughout 2016. The total number

of deaths that occurred in October-December 2016 (Q4) was 50 percent higher than the total number of deaths in January-March 2016 (Q1). However, when deaths were filtered to include only those with a prescription opioid present, the increase at Q4 compared to Q1 was only 8 percent, compared to Fentanyl/FRS/NPS (141 percent), other illicit drugs (93 percent), ethanol (67 percent), cocaine (67 percent), heroin (32 percent), and benzodiazepines (31 percent).

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Compared to all other analyzed drug categories, overdose deaths with prescription opioids demonstrated the smallest increase throughout 2016.

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Medication Assisted Treatment Drugs

Methadone, buprenorphine, and naltrexone can be used as a treatment for opioid use disorder when paired with counseling, called medication assisted treatment (MAT). Methadone is the only MAT drug screened in toxicology reports consistently across the state; thus, an analysis of methadone references is reported below.

Methadone was present in 5 percent of toxicology reports, and 37 of the 64 reporting counties. The counties with the highest rate of methadone references per 100,000 people were Blair (4.7), McKean (4.6), Armstrong (4.3), Philadelphia (4.3), and Westmoreland (4.1), in rank order. Unlike every drug category addressed above, methadone was most commonly found with benzodiazepines instead of fentanyl or heroin. Alprazolam (44 percent), fentanyl (32 percent), clonazepam (30 percent), and heroin (26 percent) were most commonly found with methadone.

Demographics

Age

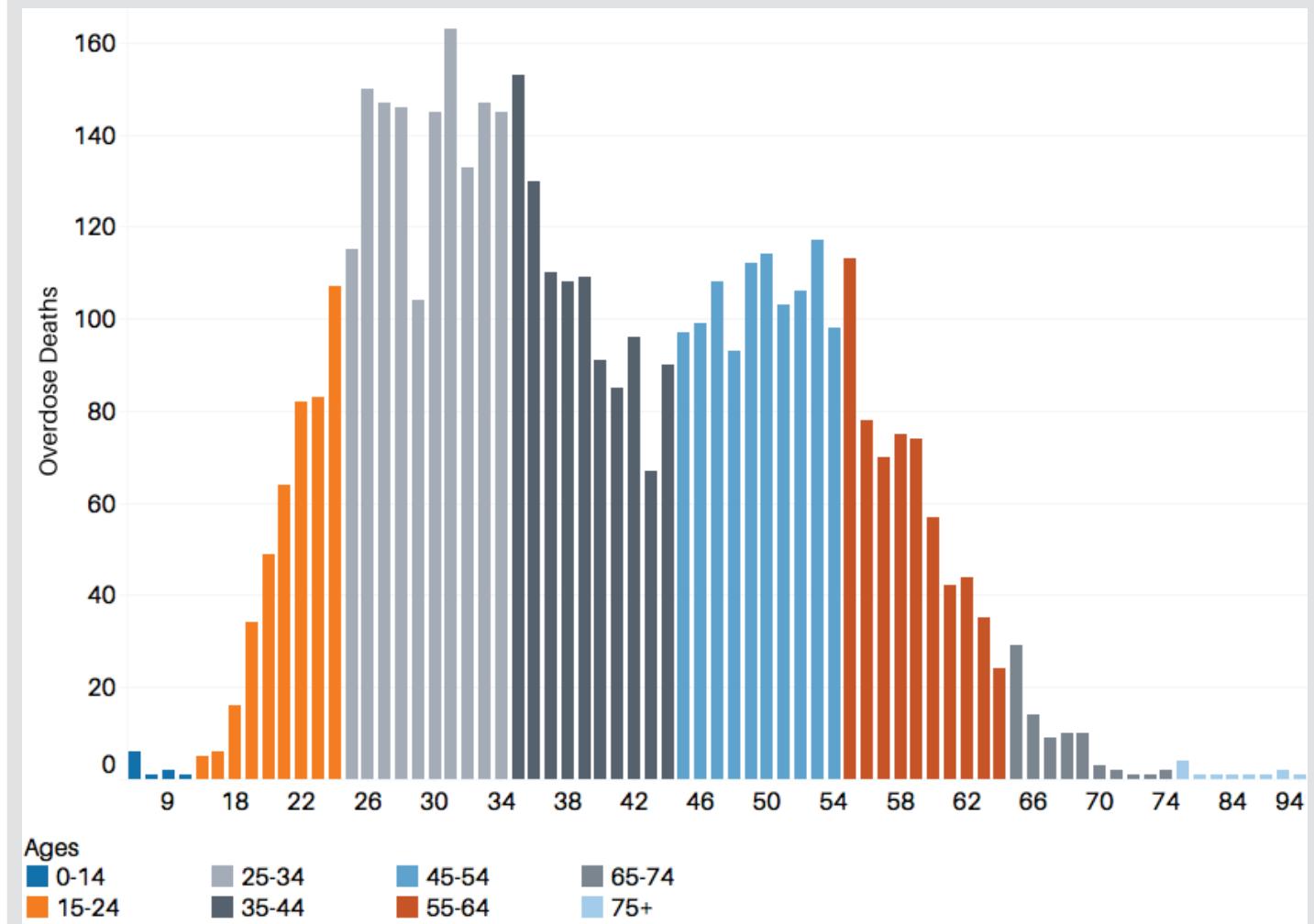
In 2016, 30 percent of drug-related overdose deaths occurred in the 25 to 34-year-old age group. This age group was disproportionately affected by overdose deaths in 2016, since according to 2010 Decennial Census data, this age group comprised only 15 percent of Pennsylvania's population. The three most affected age groups, 25-34, 45-54, and 35-44, account for 40 percent of Pennsylvania's population but accounted for 75 percent of overdose deaths in 2016. Overdose deaths

occurring in the 15-24 year age group accounted for 10 percent of all overdose deaths and comprised 14 percent of Pennsylvania's population. The age distribution chart in Figure 10 shows the bimodal distribution of the most common age groups that were affected by overdose in 2016, consistent with what was reported in 2015.

Age with Toxicology

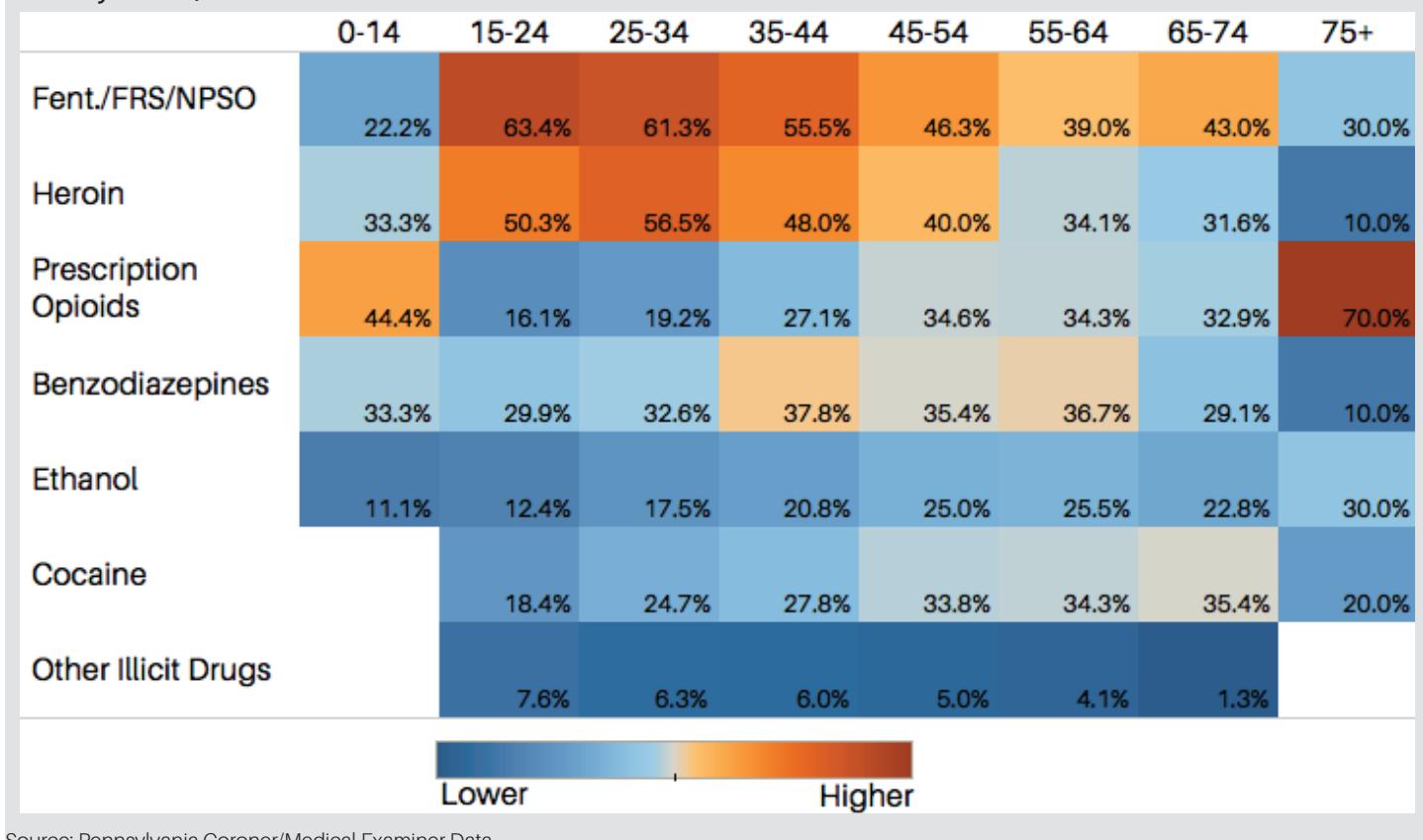
As detailed in Figure 11 (for total counts, see Appendix Table 4), fentanyl/FRS/NPSOs

(U) Figure 10: Age Distribution of Drug-Related Overdose Decedents, Pennsylvania, 2016



Source: Pennsylvania Coroner/Medical Examiner Data

(U) Figure 11: Drug Presence by Age Group among Drug-Related Overdose Decedents, Pennsylvania, 2016



Source: Pennsylvania Coroner/Medical Examiner Data

was within the top three most present drug categories of all age groups except 0-14 year olds. Aside from fentanyl/FRS/NPSOs, heroin was more common in younger and middle age groups, benzodiazepines and ethanol were more common in middle age groups, and prescription opioids and cocaine were more common in middle age and older age groups. The presence of illicit drugs declined with age, with the peak occurring within the 15-24 age group.

A younger population demographic was correlated with fentanyl/FRS usage. Drug-related overdose decedents who died between the ages 15-24 saw a 380 percent increase in the presence of fentanyl in toxicology reports compared to other age groups ($p<0.05$). Additionally, amongst decedents with fentanyl/

FRS present in toxicology reports, 35 percent and 43 percent, respectively, were within the 25-34 age group (compared to 30 percent of all overdoses being within the 25-34 age group).

Heroin was more likely to be present in the younger and middle aged population. Individuals in the 25-34 age group saw a 970 percent increase in heroin presence in toxicology reports compared to other age groups ($p<0.05$).

Gender

In 2016, 3,237 males died of drug-related overdoses (70 percent), compared to 1,403 females (30 percent). Two deaths did not indicate gender. Males disproportionately experienced overdose deaths compared to

Demographics

females, as males comprise 49 percent of the Pennsylvania population yet accounted for 70 percent of the overdose deaths in 2016. Conversely, females comprise 51 percent of the population and accounted for 30 percent of the overdose deaths reported in 2016. The distribution of overdose deaths among males and females was consistent with 2015 reporting.

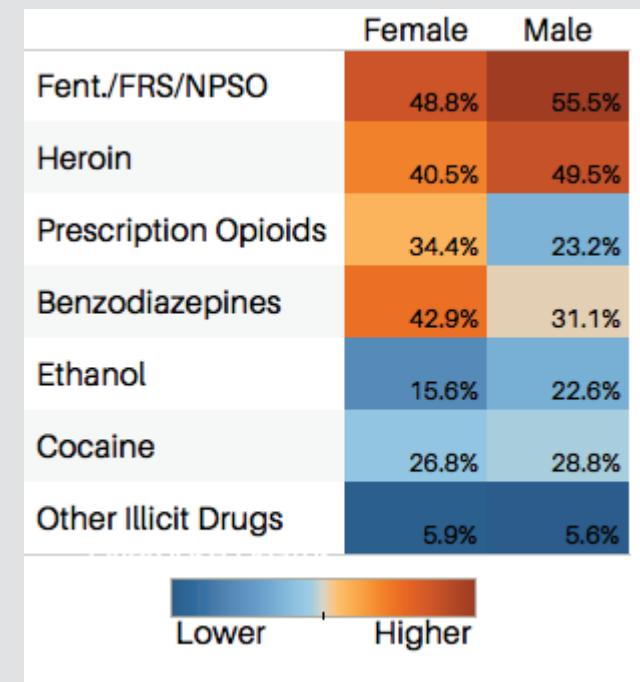
Gender with Toxicology

The three most prevalent drug categories in toxicology reports for males were fentanyl/FRS/NPSOs, heroin, and benzodiazepines; the three most prevalent drug categories for females were fentanyl/FRS/NPSOs, benzodiazepines, and heroin (see Figure 12. For total counts see Appendix Table 5). Fentanyl/FRS/NPSOs were reported in 56 percent of male overdose deaths and 49 percent of female overdose deaths. Heroin was reported in 50 percent of male overdose deaths, followed by benzodiazepines in 31 percent. Conversely, benzodiazepines were reported in 43 percent of overdose female deaths, followed by heroin in 40 percent. Prescription opioids were reported in women (34 percent) substantially more often than in men (23 percent).

For females, there was a 25 percent and 37 percent decrease, respectively, in the presence of fentanyl and heroin in toxicology reports when compared to males ($p<0.05$). Additionally, statistical analysis revealed that toxicology reports with fentanyl, heroin, cocaine, and ethanol were more prevalent in males compared to females. Alprazolam (benzodiazepine), clonazepam (benzodiazepine), and oxycodone (prescription opioid) were present in more females compared to males. In general, male overdose deaths were more often related to illicit drugs and ethanol, while female overdose deaths were more often related to prescription medications. Interestingly, 50 percent of females

had four or more drugs present in toxicology reports compared to 35 percent of males, which may account for some of the distribution observed.

(U) Figure 12: Drug Presence by Gender among Drug-Related Overdose Decedents, Pennsylvania, 2016

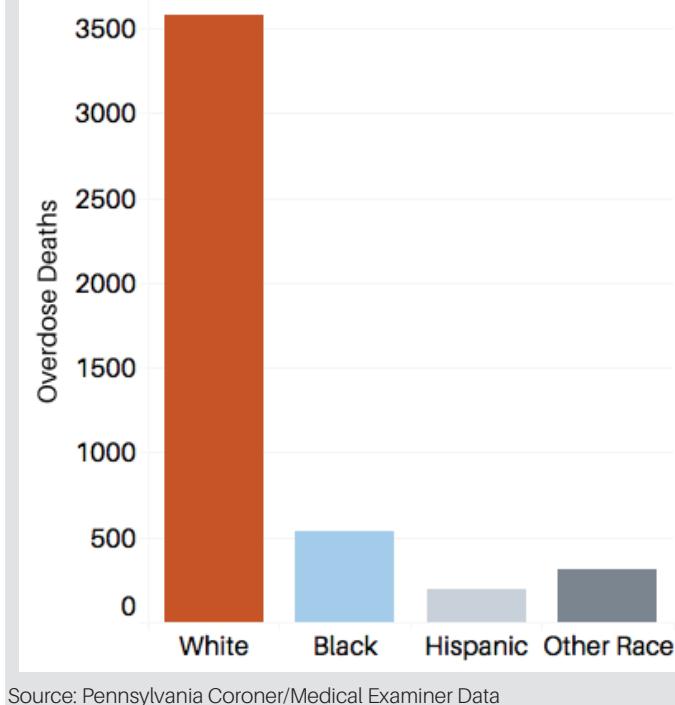


Source: Pennsylvania Coroner/Medical Examiner Data

Race

In 2016, 3,574 decedents were identified as White (77.0 percent), 534 were identified as Black (11.5 percent), 195 were identified as Hispanic (4.2 percent), 311 were identified as "Other" (6.7 percent), and 28 were identified as "Unknown" (0.6 percent) (see Figure 13). The distribution of overdose deaths among race was consistent with that reported in 2015. The racial breakdown for overdose deaths also coincides with the racial demographics in Pennsylvania, as Whites comprise approximately 77.9 percent, Blacks comprise approximately 11.6 percent, and Hispanics comprise approximately 6.6 percent of Pennsylvania's population.

(U) Figure 13: Race of Drug-Related Overdose Decedents, Pennsylvania, 2016



Race with Toxicology

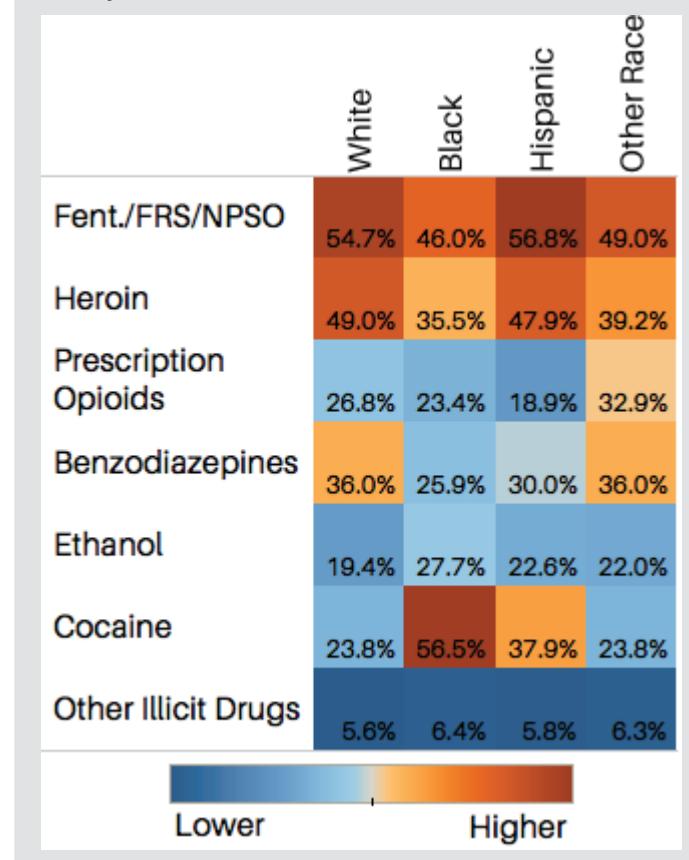
In 2016, the most prevalent drug category identified in overdose deaths differed amongst the racial groups (see Figure 14. For total counts see Appendix Table 6). The three most prevalent drug categories in toxicology reports for White decedents were fentanyl/FRS/NPSOs (55 percent), heroin (49 percent), and benzodiazepines (36 percent). White decedents were more likely to have heroin and benzodiazepines present in an overdose death compared to other racial groups.

The three most prevalent drug categories in toxicology reports for Black decedents were cocaine (57 percent), fentanyl/FRS/NPSOs (46 percent), and heroin (36 percent). Black decedents were more likely to have cocaine present in an overdose death compared to other racial groups.

The three most prevalent drug categories in toxicology reports for Hispanic decedents were fentanyl/FRS/NPSOs (57 percent), heroin (47 percent), and cocaine (38 percent). Hispanic decedents were more likely to have fentanyl/FRS/NPSOs present in an overdose death compared to other racial groups.

The three most prevalent drug categories in toxicology reports for decedents of Other Races were fentanyl/FRS/NPSOs (49 percent), heroin (39 percent), and benzodiazepines (36 percent). Decedents identified as Other Race were more likely to have prescription opioids present in an overdose death compared to other racial groups.

(U) Figure 14: Drug Presence by Race Among Drug-Related Overdose Decedents, Pennsylvania, 2016



Demographics

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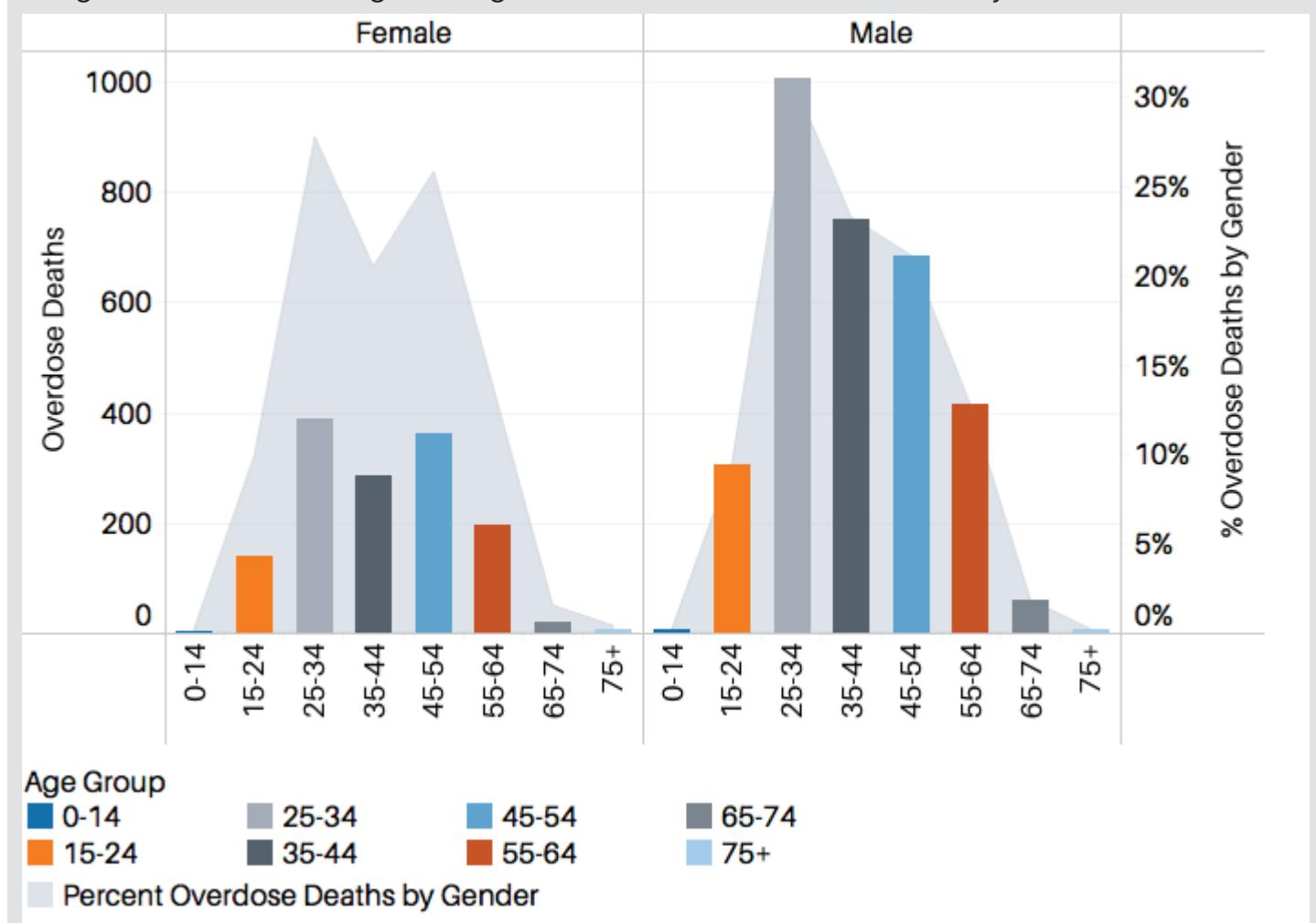
At the request of the PFD, the TAC conducted regression analysis to measure the effect of race on fentanyl- and heroin-related overdose deaths. Individuals that were identified as Black and Other Race saw a 20 percent and 27 percent decrease, respectively, in the presence of fentanyl in toxicology reports, when compared to other racial groups (Black, $p<0.05$; Other Race, $p<0.05$). Additionally, individuals identified as Black and Other Race saw a 47 percent and 56 percent decrease, respectively, in heroin presence in toxicology reports when compared to other racial groups (Black, $p<0.05$; Other Race, $p<0.05$).

Gender and Age

Figure 15 depicts the total number of overdose deaths by gender and designated age groups. In 2016, the majority of overdose deaths occurred in males aged 25-34. The 25-34 age group accounted for the largest percentage of deaths within each gender, including 31 percent of males and 28 percent of females.

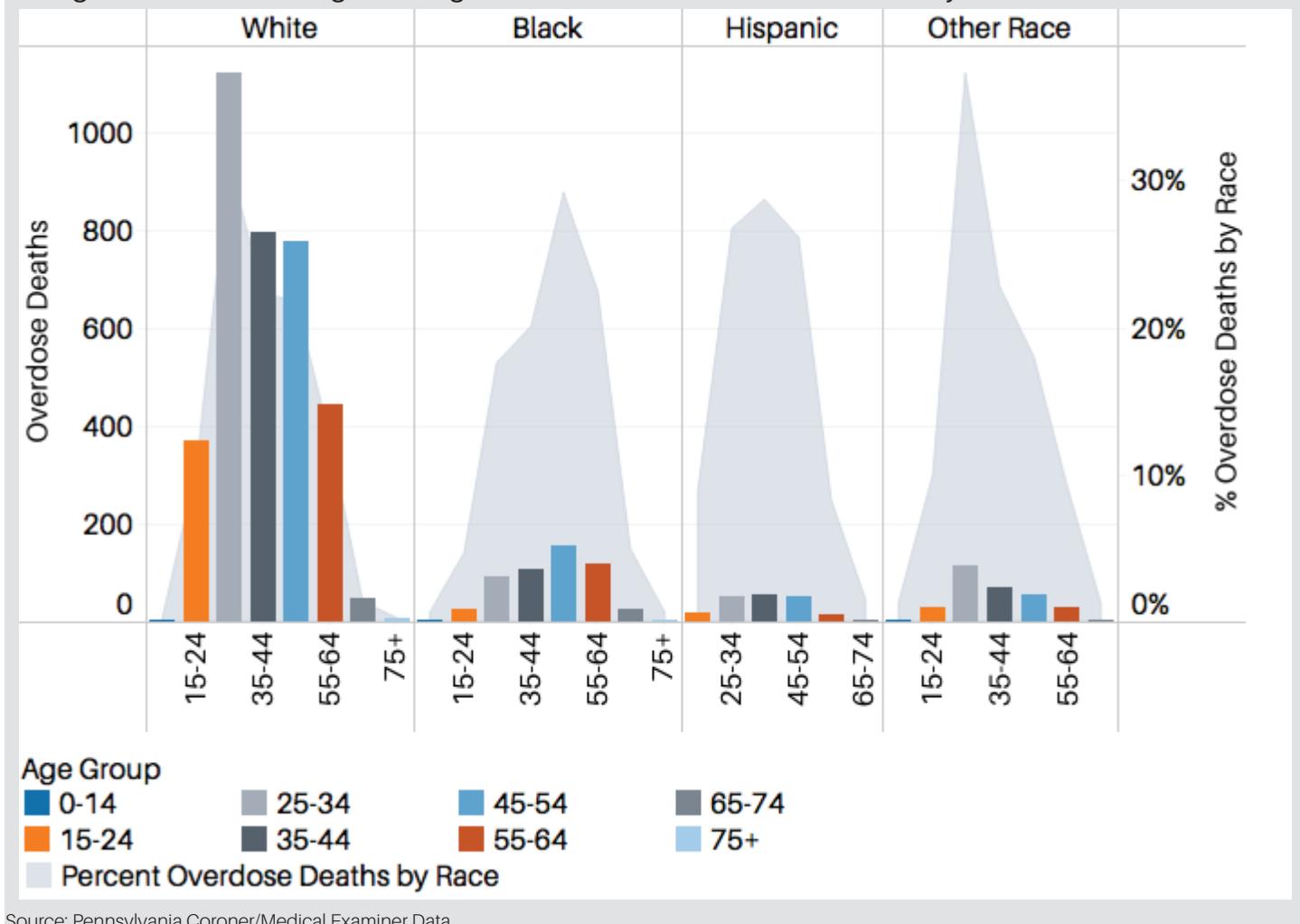
The second and third highest percentage of deaths within the male population was the 35-44 and 45-54 year old age groups (23 percent and 21 percent of total deaths per gender, respectively). The second and third

(U) Figure 15: Gender and Age of Drug-Related Overdose Decedents, Pennsylvania, 2016



Source: Pennsylvania Coroner/Medical Examiner Data

(U) Figure 16: Race and Age of Drug-Related Overdose Decedents, Pennsylvania, 2016



Source: Pennsylvania Coroner/Medical Examiner Data

highest percentage of deaths within the female population was the 45-54 and 35-44 year old age groups (26 percent and 20 percent of total deaths per gender, respectively). Women aged 45-54 were disproportionately affected by overdose compared to men of the same age.

Race and Age

Figure 16 depicts the total number of overdose deaths by race and designated age groups. In 2016, the majority of overdose deaths occurred in White individuals aged 25-34. The 25-34 age group accounted for the largest percentage

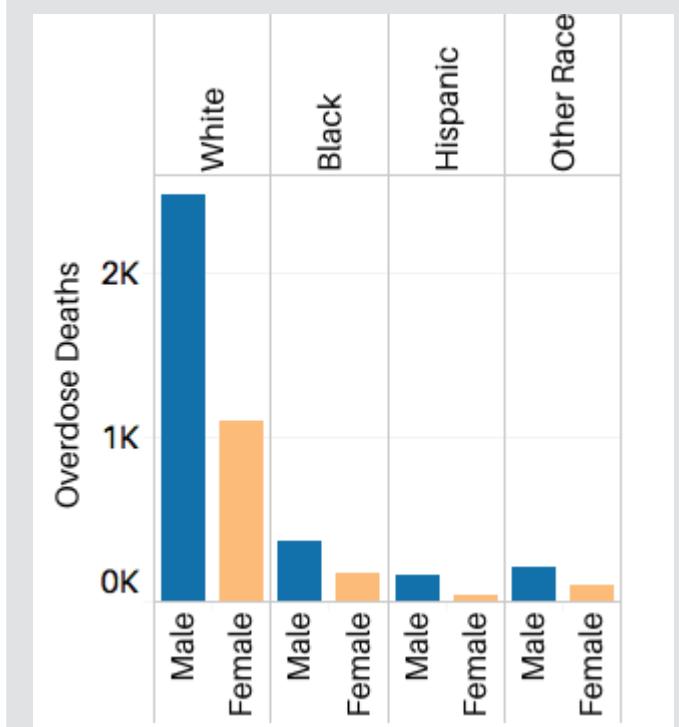
of deaths for individuals identified as White (31 percent) and Other Race (37 percent); the 45-54 age group accounted for the largest percentage of deaths for individuals identified as Black (29 percent); and the 35-44 age group accounted for the largest percentage of deaths for individuals identified as Hispanic (29 percent). Two noticeable differences were apparent in the analysis of age and race. First, Black decedents were significantly older than other races. Second, Hispanic decedents had a relatively even distribution between the top three age groups, instead of a peak, as observed in the other races.

Demographics

Race and Gender

Figure 17 details the number of overdose deaths within each racial group by gender. As noted earlier, 70 percent of all overdose deaths in Pennsylvania were male and 30 percent were female. Distribution of overdose deaths among males and females were similar: for White (69 percent, 31 percent, respectively), Black (68 percent, 32 percent, respectively), and Other Race (68 percent, 32 percent, respectively). Conversely, a significantly greater percentage of Hispanic males were adversely affected by overdose (83 percent male, 17 percent female) in 2016.

(U) Figure 17: Race and Gender of Drug-Related Overdose Decedents, Pennsylvania, 2016



Source: Pennsylvania Coroner/Medical Examiner Data

Data Challenges

Data Challenges

- ◆ The existence of valid prescriptions for opioids and benzodiazepines were not analyzed in this report, therefore, this report does not assess if these substances were obtained fraudulently, were diverted from legitimate sources, or identify the method of administration.
- ◆ Analysis for this assessment focused on deaths classified as a drug-related overdose; cause of death was determined by the county coroner or medical examiner. However, determining causation related to overdoses is subjective and can vary widely depending on the investigative efforts/abilities of the coroner and the evidence available for review, which result in inherent difficulties in making causation decisions^{xvi}, especially with regard to heroin overdoses. Therefore, it is possible that the data analyzed in this assessment underrepresents the true number and nature of drug-related overdose deaths in Pennsylvania.
- ◆ Each county in Pennsylvania is responsible for procuring or conducting toxicology testing, which is most commonly accomplished through the services at private laboratories. The scope of the toxicology tests is at the discretion of the requestor. Therefore, this dataset is not standardized, and the lack of reporting of an individual drug in a county cannot be construed to mean that it was not present, but instead may not have been part of the requested toxicology test panel. Philadelphia County (which accounted for approximately 20 percent of statewide overdose deaths in 2016) does not report the presence of marijuana in postmortem toxicology; therefore, it was not included

in this analysis due to the inability to draw conclusions across the dataset. In addition, basic postmortem toxicology panels utilized most often by coroners and medical examiners do not include testing for synthetic cannabinoids and cathinones. Therefore, it is not possible to analyze or draw conclusions regarding the impact of these substances in the overdose dataset^{xvii}.

- ◆ The data request for this assessment included residence and death zip code, however, the majority of data provided did not include any zip code information. Therefore, it was not possible to examine or conclude that the county in which the person died was their county of residence. Furthermore, the data does not identify the location from which illicit drugs or diverted pharmaceuticals were purchased or obtained.
- ◆ Finally, the continued lack of standardized and centralized reporting of drug-related overdose death data in Pennsylvania inhibits timely analysis necessary for stakeholders to drive decision-making. Efforts must continue amongst the myriad data collectors to streamline compilation and develop a common mechanism for information sharing that serves the public interest.

^{xvi}"No standard exists in PA to accurately track heroin overdose deaths," WITF news, April 9, 2015.

^{xvii}Based on query and response by Philadelphia Medical Examiner's Office, Allegheny County Office of the Medical Examiner, and NMS Labs.

County Analysis and Outlook

County Analysis

Appendix Figure 1 shows total number of drug-related overdose deaths by county in 2016. Individual analyses of Cameron, Elk, Forest, Juniata, Potter, Snyder, Sullivan, and Warren Counties were not prepared due to their reporting of less than five overdose deaths. To allow counties with fewer raw overdose death numbers to identify meaningful trends, additional analyses were conducted based on the six Community Health Districts used by the Pennsylvania Department of Health (Appendix Figures 2-7). Individual county analysis was conducted and is represented in Appendix Figures 10-68. Each county's analysis contains the 2015 and 2016 overdose count; 2016 rank by rate; 2016 rank by count; 2016 rate of overdose deaths per 100,000 people; top 10 drugs present in drug-related overdose deaths; age, gender, and race distribution; drug-related overdose deaths for each quarter by drug category; and percent change from 2015 to 2016.

Outlook

Assessing the impact of the myriad efforts enacted by the aforementioned parties is measured in years and cannot be evaluated by a single factor, such as overdose deaths. One of the most important components in reducing drug-related overdose deaths is to prevent initial drug use; as such, the impact of education and prevention strategies in use today will be shown in future years. The PFD will continue efforts, in conjunction with law enforcement and public health partners, to define and address the factors impacting availability and abuse of illicit drugs and diverted pharmaceuticals in Pennsylvania, and ultimately overdose deaths.

As evidenced by the upward trajectory of drug-related overdose deaths over the past several

years in Pennsylvania, a crisis exists among law enforcement, public health entities, and educators to address drug availability, drug treatment, and drug education. The results of this analysis reinforce that the use and abuse of opiates, particularly fentanyl and heroin, are fueling this crisis, which is expected to continue and possibly grow over the near term.

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Appendix

(U) Appendix Table 1: Pennsylvania Urban and Rural Counties

Pennsylvania Urban Counties		Pennsylvania Rural Counties		
Allegheny	Philadelphia	Adams	Fayette	Northumberland
Beaver	Westmoreland	Armstrong	Forest	Perry
Berks	York	Bedford	Franklin	Pike
Bucks		Bradford	Fulton	Potter
Chester		Blair	Greene	Schuylkill
Cumberland		Butler	Huntingdon	Snyder
Dauphin		Cambria	Indiana	Somerset
Delaware		Cameron	Jefferson	Sullivan
Erie		Carbon	Juniata	Susquehanna
Lackawanna		Centre	Lawrence	Tioga
Lancaster		Clarion	Lycoming	Union
Lebanon		Clearfield	McKean	Venango
Lehigh		Clinton	Mercer	Warren
Luzerne		Columbia	Mifflin	Washington
Montgomery		Crawford	Monroe	Wayne
Northampton		Elk	Montour	Wyoming

Source: The Center for Rural Pennsylvania

(U) Appendix Table 2. Drug Category Percentages and Rates of Overdose in Drug-Related Overdose Decedents, Pennsylvania, 2016

Drug Category	% Reported Among 2016 Decedents	Rates of Overdose Deaths per 100,000
Fentanyl/FRS/NPSOs	52%	18.8
Heroin	45%	16.4
Benzodiazepines	33%	12.1
Prescription Opioids	25%	9.3
Cocaine	27%	9.9
Ethanol	20%	7.1
Other Illicit Drugs	5.5%	2.0

Source: Pennsylvania Coroner Data and www.census.gov

Appendix

(U) Appendix Table 3: Drug Name, Category, and Description for Substances Reported in Drug-Related Overdose Deaths, Pennsylvania, 2016

Drug Category	Drug Name	Description
Benzodiazepines	Alprazolam	Primary drug. Classified as a benzodiazepine, with the common brand name of Xanax®. Placed in Schedule IV under the CSA.
	Chlordiazepoxide	Primary drug that is in the benzodiazepine class and used to treat anxiety. Common brand name is Librium®. Placed in Schedule IV under the CSA.
	Clonazepam	Primary drug that is metabolized to 7-aminoclonazepam. Classified as a benzodiazepine and used to treat anxiety. Common brand name is Klonopin®. Placed in Schedule IV under the CSA.
	Delorazepam	Delorazepam also known as chlordesmethyldiazepam and Nordiclatzepam is a drug which is a benzodiazepine and a derivative of desmethyldiazepam. Placed in Schedule IV under the CSA.
	Diazepam	Primary drug. Classified as a benzodiazepine and used to treat anxiety. Common brand name is Valium®. Placed in Schedule IV under the CSA.
	Estazolam	Estazolam is a benzodiazepine derivative drug developed by Upjohn in the 1970. Placed in Schedule IV under the CSA.
	Flurazepam	Primary drug. Classified as a benzodiazepine. This medication can be used to help treat sleep disorders. Common brand name is Dalmane®. Placed in Schedule IV under the CSA.
	Lorazepam	Primary Drug. Sedative. It can treat seizure disorders, such as epilepsy. It can also be used before surgery and medical procedures to relieve anxiety. Brand names include Ativan®. Placed in Schedule IV under the CSA.
	Midazolam®	Primary drug. Classified as a benzodiazepine. Used for anesthesia or procedural sedation. Common brand name is Versed®. Placed in Schedule IV under the CSA.
	Oxazepam	Primary drug. Classified as a benzodiazepine and used to treat anxiety. Placed in Schedule IV under the CSA.
Cocaine	Temazepam	Classified as a benzodiazepine. Used to treat insomnia. Common brand name is Restoril®. Can be metabolite of Diazepam as well and can be present as a primary drug as well. Placed in Schedule IV under the CSA.
	Cocaine	Primary drug. Local anesthetic often illegally made and used illicitly for its stimulant effects. Placed in Schedule II under the CSA.

Drug Category	Drug Name	Description
Ethanol	Ethanol	Primary reference for all evidence indicating consumption of alcohol.
Fentanyl, FRS, NPSOs	3-Methyl Fentanyl	3-Methylfentanyl (3-MF, mefentanyl) is an opioid analgesic that is an analogue of fentanyl. Placed in Schedule I under the CSA.
	4-Methoxy-Butyryl Fentanyl	Primary Drug. It is a potent short-acting synthetic opioid analgesic drug. It is an analogue of fentanyl. It is not approved for medical use.
	Acetyl Fentanyl	Acetyl Fentanyl is an opioid analgesic similar to Fentanyl. It is an analogue of fentanyl. Placed in Schedule I under the CSA.
	Acryl Fentanyl	Acryl fentanyl (also known as acryloylfentanyl) is an analogue of fentanyl and has been sold online as a designer drug. Controlled in China as of March 1, 2017. It is not approved for medical use.
	Carfentanil	Carfentanil is a synthetic opioid analgesic drug. It is used primarily as a tranquilizer for large animals such as elephants and sold pharmaceutically under the brand name Wildnil®. Clandestinely-produced carfentanil is sold online for abuse. Placed in Schedule II under the CSA.
	Fentanyl	Primary drug. Classified as an opioid that is used to treat severe pain. Common brand names are Duragesic®, Abstral®, and Subsys®. Placed in Schedule II under the CSA.
	Fluorobutyrifentanyl	Analogue of fentanyl; not controlled in the United States.
	Fluorofentanyl	Analogue of fentanyl; not controlled in the United States.
	Furanyl Fentanyl	Furanyl fentanyl is an opioid analgesic that is an analogue of fentanyl. Placed in Schedule I under the CSA.
	Para-Fluoro-Isobutyryl-Fentanyl/FIBF	Analogue of fentanyl; placed in Schedule I under the CSA.

Appendix

Drug Category	Drug Name	Description
	Sufentanil	Sufentanil is a synthetic opioid analgesic drug. Placed in Schedule II under the CSA.
	U-47700	U-47700 is an opioid analgesic drug that has no pharmaceutical indications. Placed in Schedule I under the CSA.
Heroin	Heroin	Heroin is a primary drug, but rarely found in toxicology reports. Evidence of heroin consumption may be found at the scene and in toxicology reports with the presence of 6-monoacetylmorphine, morphine, codeine, and/or diacetylmorphine. Placed in Schedule I under the CSA.
Medication Assisted Treatment	Buprenorphine	Buprenorphine. Primary Drug. An opioid that can treat moderate to severe pain. It can also be used as part of medication assisted treatment for opioid addiction, and is a partial agonist. Brand names include Suboxone® when combined with naloxone and Subutex®, Cizdol®, Temgesic®, Buprenex®, Norspan®, and Butrans®. Placed in Schedule III under the CSA.
	Methadone	Methadone. Primary Drug. An opioid that can treat moderate to severe pain. It can also be used as part of medication assisted treatment for opioid addiction, and is an agonist. Brand names include Diskets®, Methadose®, and Dolophine®. Placed in Schedule II under the CSA.
Other Illicit Drugs	Lysergic Acid Diethylamide (LSD)	Lysergic acid diethylamide (LSD), also known as acid, is a psychedelic drug known for its psychological effects. Placed in Schedule I under the CSA.
	MDA/Methylenedioxymethamphetamine	Primary Drug. Also known as tenamphetamine. A psychoactive recreation drug. Placed in Schedule I under the CSA.
	MDMA/3,4-Methylenedioxymethamphetamine	Commonly known as Ecstasy or Molly. MDMA, which is an analogue of MDA, is mainly used for recreational use. Placed in Schedule I under the CSA.
	Methamphetamine	Methamphetamine is a stimulant and is placed in Schedule II under the CSA.
	PCP/Phencyclidine	Primary drug. It is a recreational dissociation drug classified as a N-methyl-D-aspartate (NMDA) receptor antagonist. Placed in Schedule II under the CSA.

Drug Category	Drug Name	Description
Prescription Opioids	Hydrocodone	Primary drug. Classified as an opioid pain medication. Synthesized from codeine and an opioid alkaloids. Common brand names include Vicodin®, Lortab®, Lorcet®, and Norco®. Placed in Schedule I under the CSA.
	Hydromorphone	Primary drug. Classified as an opioid pain medication. Hydromorphone can be a metabolite of hydrocodone. It is also a metabolite when morphine is present in high concentration. If morphine and hydromorphone both are present consider both as parent drug. Common brand name is Dilaudid®. Placed in Schedule II under the CSA.
	Meperidine	Primary Drug. Classified as a narcotic. Used to treat moderate to severe pain. Common brand name is Demerol®. Placed in Schedule II under the CSA.
	Morphine	An opioid medication used to treat moderate to severe pain. Common brand name is Duramorph®. Can be a metabolite of heroin along with codeine depending on the levels present in the body. Can also be listed as primary drug. Placed in Schedule II under the CSA.
	Oxycodone	Primary Drug. Oxycodone is an opioid pain medication used to treat moderate to severe pain. Brand names include, OxyContin®, Oxyfast®, Percocet®, Percodan®, Roxicodone®, Roxicet®, and Xtampza ER®. Placed in Schedule II under the CSA.
	Oxymorphone	Primary drug. Oxymorphone is a narcotic pain reliever. It works in the brain and nervous system to reduce pain. It may also affect other body systems (e.g., respiratory, circulatory) at higher doses. Common brand name is Opana®. It can either be a primary drug or can also be metabolite
	Tramadol	Primary drug. Narcotic like drug which is also used as a pain reliever. Common brand name is Ultram®. Placed in Schedule IV under the CSA.

Source: Drug Enforcement Administration

Appendix

(U) Appendix Table 4: Number of Drug Mentions by Category and Age in Drug-Related Overdose Decedents, Pennsylvania, 2016

Drug Category	0-14	15-24	25-34	35-44	45-54	55-64	65-74	75+
Heroin	3	219	767	479	397	198	25	1
Ethanol	1	54	238	208	248	148	18	3
Cocaine		80	335	277	336	199	28	2
Benzodiazepines	3	130	443	377	352	213	23	1
Fentanyl/FRS/NPSOs	2	276	832	554	460	226	34	3
Other Illicit Drugs		33	86	60	50	24	1	
Prescription Opioids	4	70	261	270	344	199	26	7

Source: Pennsylvania Coroner/Medical Examiner Data

(U) Appendix Table 5: Number of Drug Mentions by Category and Gender in Drug-Related Overdose Decedents, Pennsylvania, 2016

Drug Category	Female	Male
Heroin	531	1,558
Ethanol	205	712
Cocaine	351	906
Benzodiazepines	563	978
Fentanyl/FRS/NPSOs	640	1,746
Other Illicit Drugs	78	176
Prescription Opioids	451	730

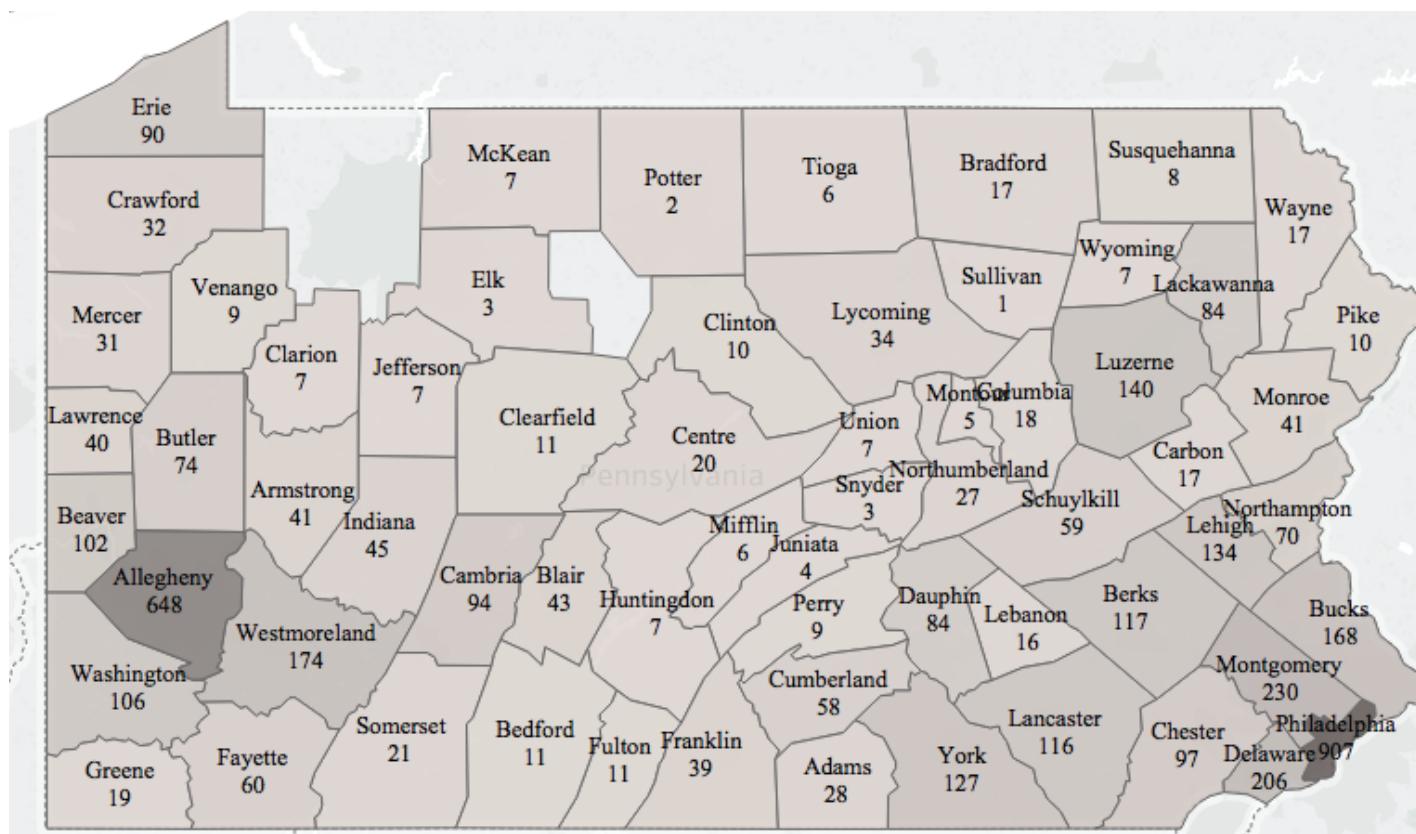
Source: Pennsylvania Coroner/Medical Examiner Data

(U) Appendix Table 6: Number of Drug Mentions by Category and Race in Drug-Related Overdose Decedents, Pennsylvania, 2016

Drug Category	White	Black	Hispanic	Other Race
Heroin	1,689	182	91	112
Ethanol	667	142	43	63
Cocaine	818	290	72	68
Benzodiazepines	1,240	133	57	103
Fentanyl/FRS/NPSOs	1,885	236	108	140
Other Illicit Drugs	192	33	11	18
Prescription Opioids	922	120	36	94

Source: Pennsylvania Coroner/Medical Examiner Data

(U) Appendix Figure 1: Number of Drug-Related Overdose Deaths by County, Pennsylvania, 2016



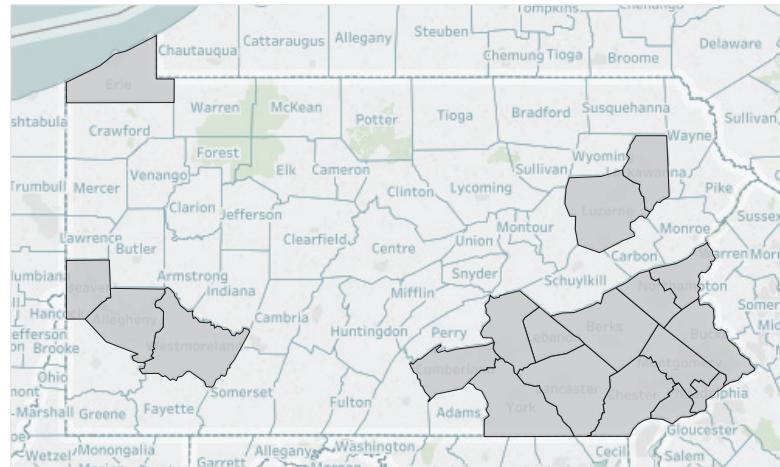
Source: Pennsylvania Coroner/Medical Examiner Data

Appendix

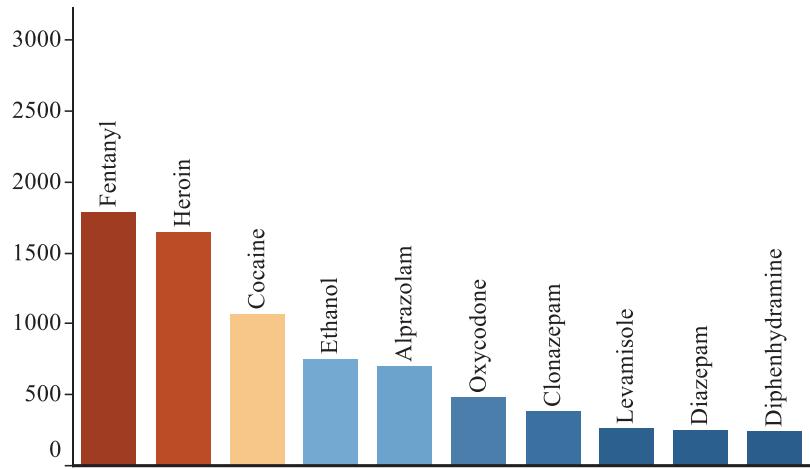
(U) Appendix Figure 2: Analysis of Overdose Death Data within District: Urban

Urban

2016 Overdose Count: 3,568



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



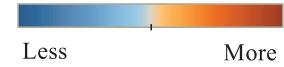
Age, Race, and Gender Distribution of Overdose Deaths in 2016

Race	Ages	Male	Female
White	0-14		
	15-24	187	84
	25-34	594	245
	35-44	431	148
	45-54	381	214
	55-64	245	105
	65-74	21	16
	75+	4	5
	0-14		
	15-24		
Black	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
	0-14		
	15-24		
	25-34		
	35-44		
Hispanic	45-54		
	55-64		
	65-74		
	75+		
	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
Other	65-74		
	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
	0-14		

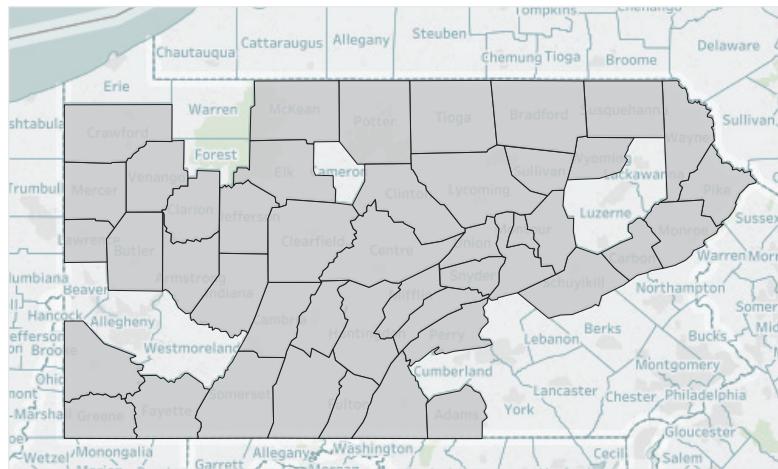
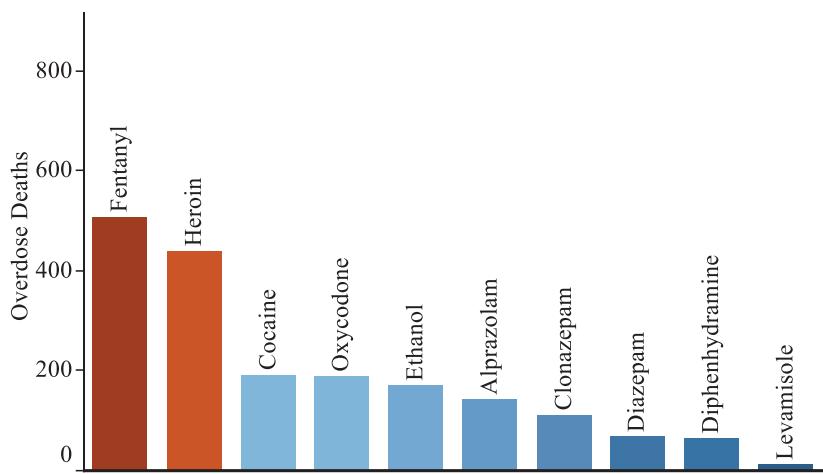
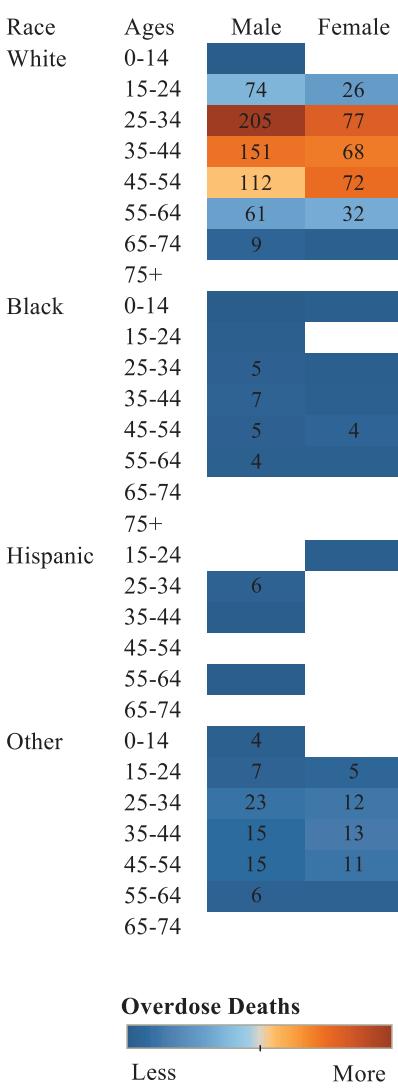
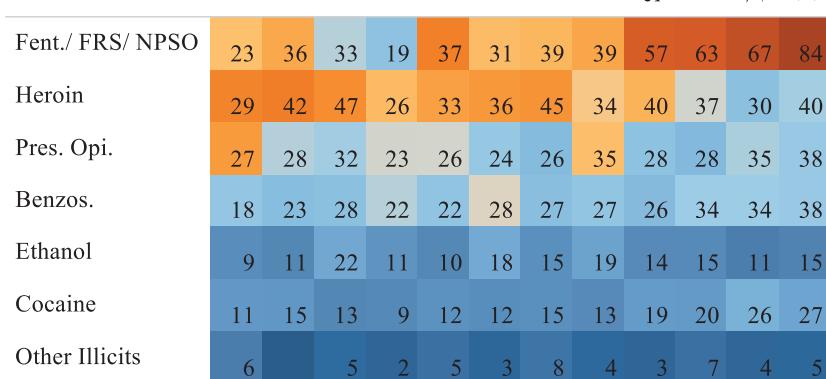
Deaths by Drug Category per Month

	January	February	March	April	May	June	July	August	September	October	November	December
Fent./ FRS/ NPSO	50	150	115	100	113	112	152	133	166	207	261	300
Heroin	82	137	132	129	119	126	131	132	150	151	168	193
Pres. Opi.	47	81	80	72	55	63	62	77	76	67	72	79
Benzos.	73	109	102	108	78	93	105	99	90	103	110	145
Ethanol	33	53	44	57	50	54	64	63	83	86	72	89
Cocaine	50	82	86	80	72	69	84	84	103	84	135	136
Other Illicit	10	10	12	14	13	22	11	15	28	12	22	33

Overdose Deaths



(U) Appendix Figure 3: Analysis of Overdose Death Data within District: Rural

Rural**2016 Overdose Count: 1,074****Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths****Age, Race, and Gender Distribution of Overdose Deaths in 2016****Deaths by Drug Category per Month**

Source: Pennsylvania Coroner/Medical Examiner Data

Appendix

(U) Appendix Figure 4: Analysis of Overdose Death Data within District: North Central District

North Central District

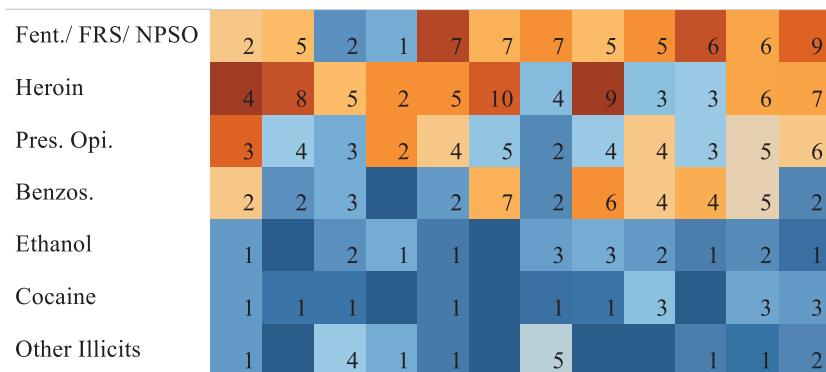
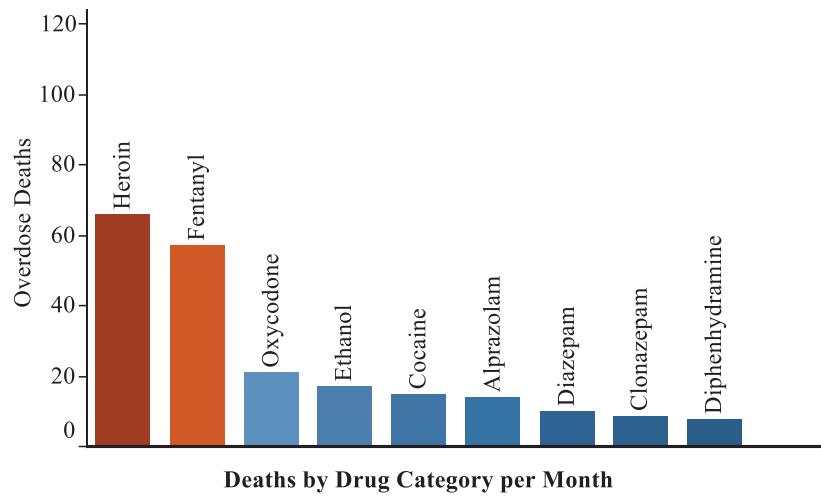
2016 Overdose Count: 150

2016 Overdose Rate

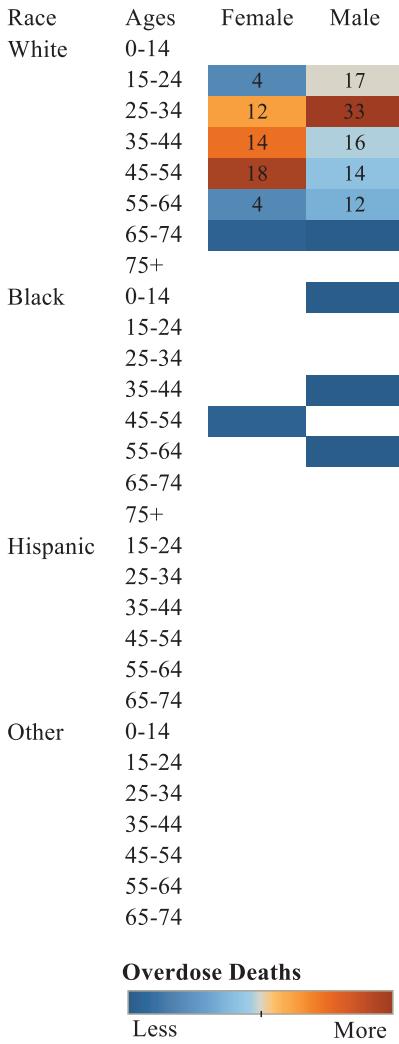
Bradford	27.15
Centre	12.99
Clinton	25.49
Columbia	26.75
Lycoming	29.28
Montour	27.37
Northumberland	28.56
Potter	11.46
Snyder	7.56
Sullivan	15.56
Tioga	14.29
Union	15.57



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



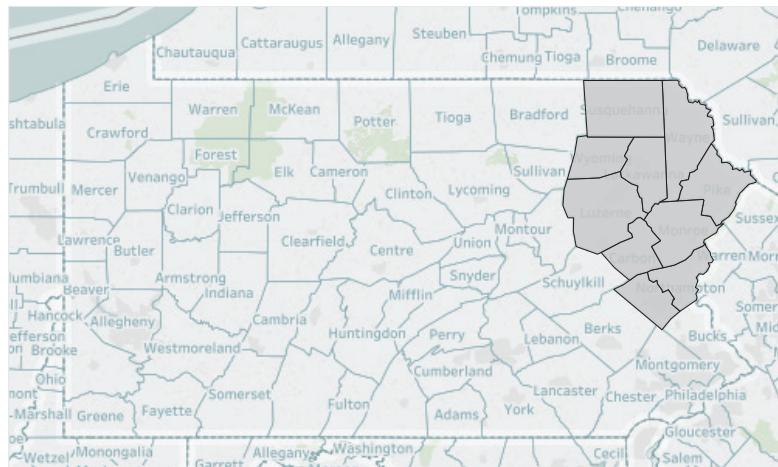
(U) Appendix Figure 5: Analysis of Overdose Death Data within District: Northeast District

Northeast District

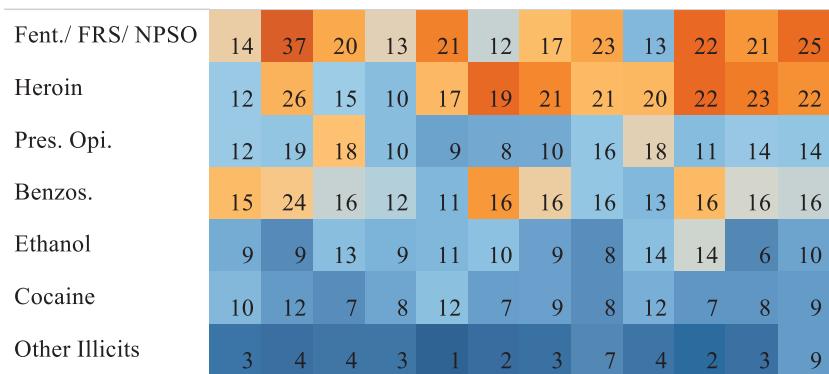
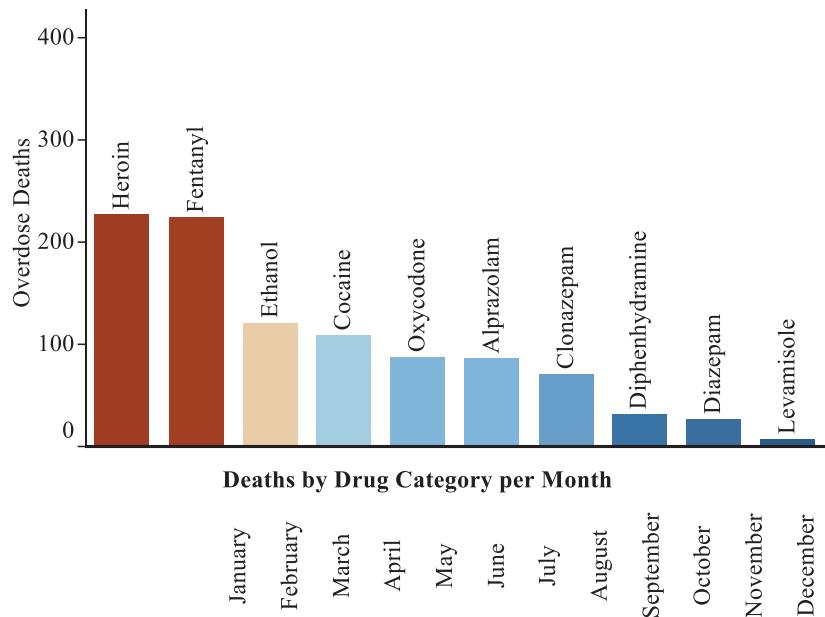
2016 Overdose Count: 528

2016 Overdose Rate

Carbon	26.05
Lackawanna	39.17
Lehigh	38.34
Luzerne	43.62
Monroe	24.14
Northampton	23.51
Pike	17.43
Susquehanna	18.45
Wayne	32.18
Wyoming	24.76



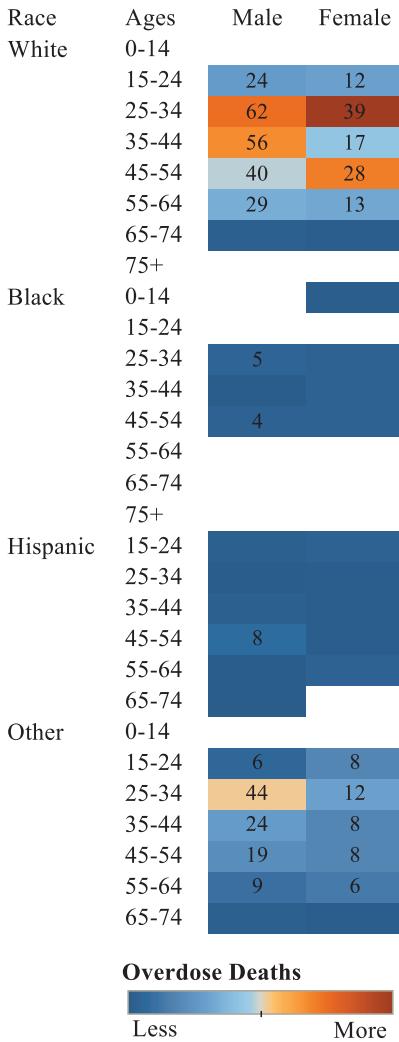
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Source: Pennsylvania Coroner/Medical Examiner Data

UNCLASSIFIED

Age, Race, and Gender Distribution of Overdose Deaths in 2016



Appendix

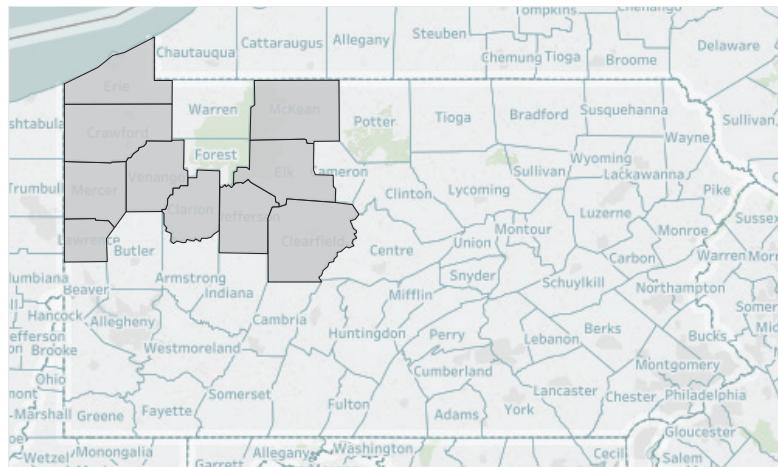
(U) Appendix Figure 6: Analysis of Overdose Death Data within District: Northwest District

Northwest District

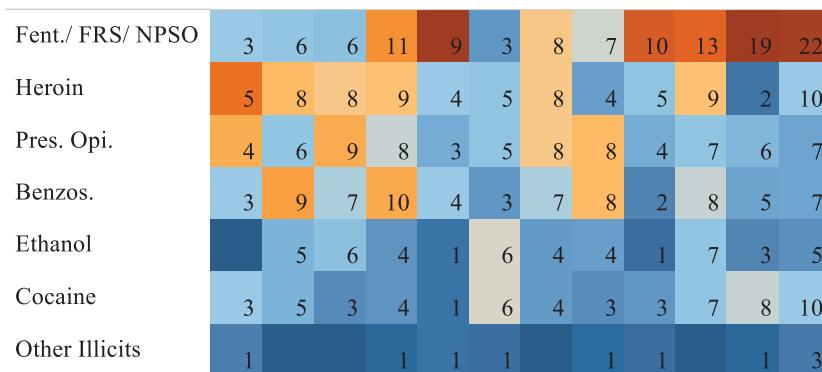
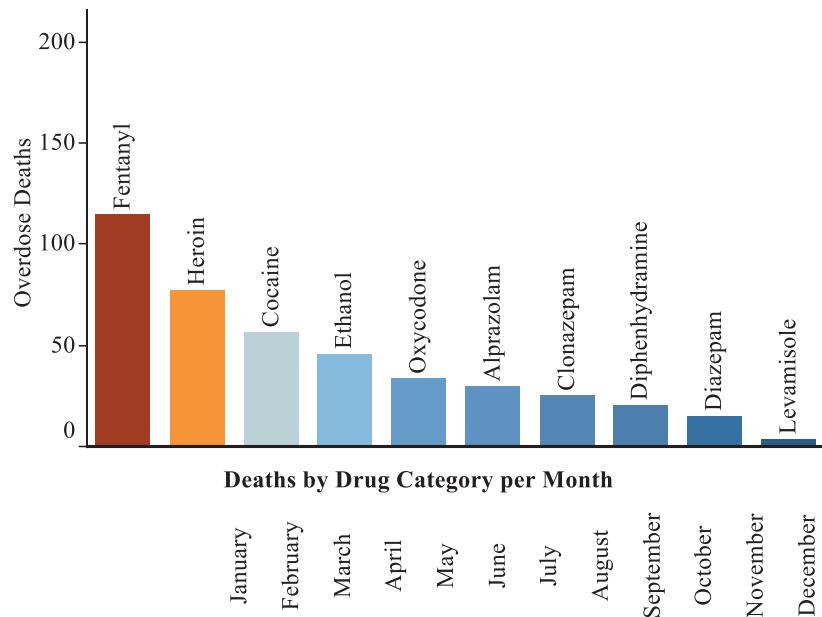
2016 Overdose Count: 237

2016 Overdose Rate

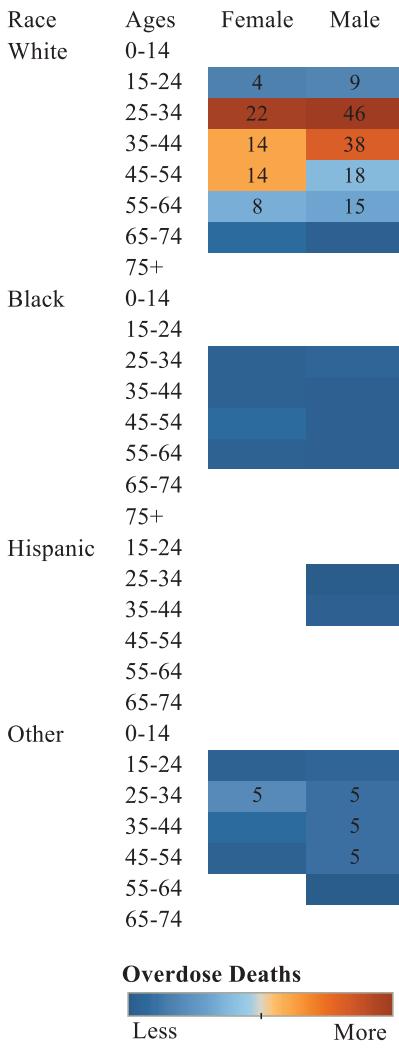
Clarion	17.51
Clearfield	13.47
Crawford	36.05
Elk	9.39
Erie	32.08
Jefferson	15.49
Lawrence	43.90
McKean	16.11
Mercer	26.58
Venango	16.37



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



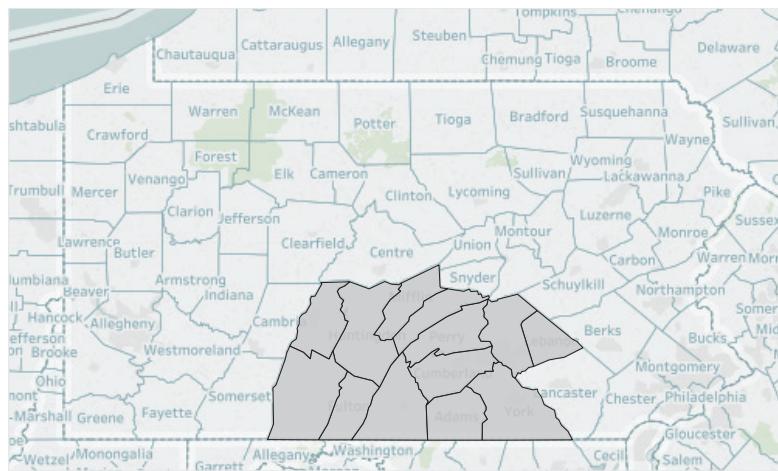
(U) Appendix Figure 7: Analysis of Overdose Death Data within District: South Central District

South Central District

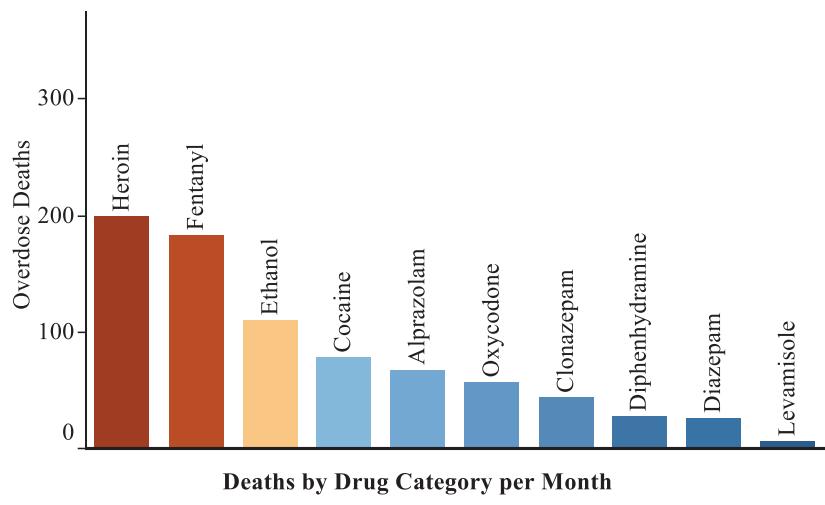
2016 Overdose Count: 443

2016 Overdose Rate

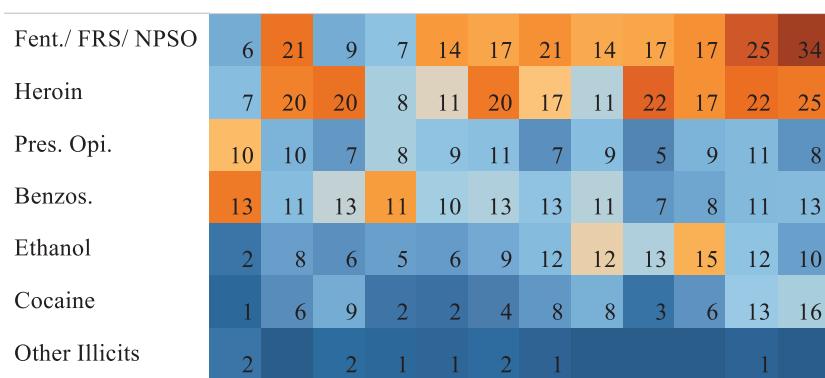
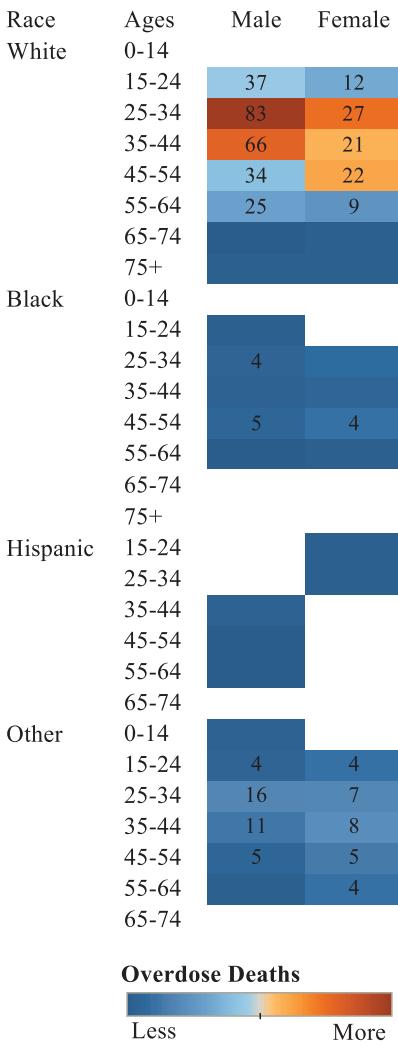
Adams	27.61
Bedford	22.11
Blair	33.83
Cumberland	24.64
Dauphin	31.33
Franklin	26.07
Fulton	74.10
Huntingdon	15.25
Juniata	16.24
Lebanon	11.98
Mifflin	12.85
Perry	19.58
York	29.20



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Source: Pennsylvania Coroner/Medical Examiner Data

Appendix

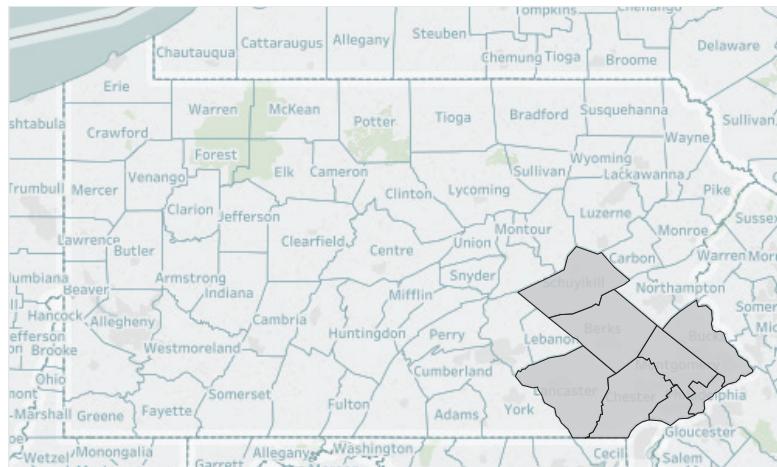
(U) Appendix Figure 8: Analysis of Overdose Death Data within District: Southeast District

Southeast District

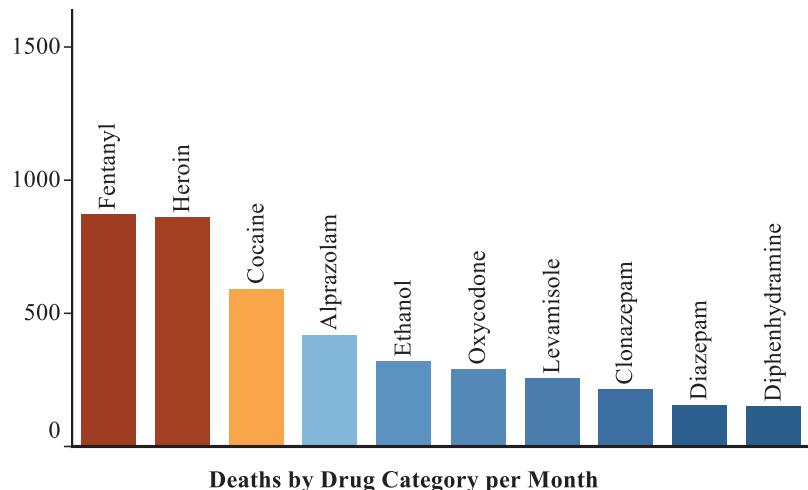
2016 Overdose Count: 1,900

2016 Overdose Rate

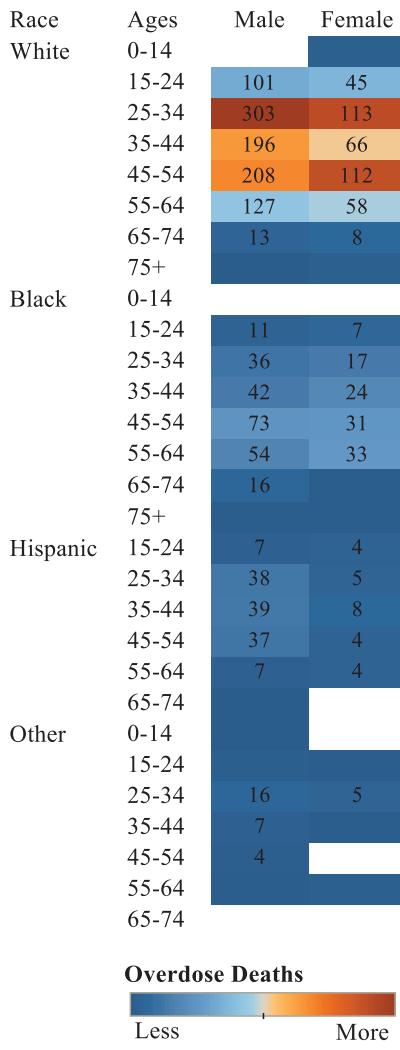
Berks	28.44
Bucks	26.87
Chester	19.44
Delaware	36.85
Lancaster	22.33
Montgomery	28.75
Philadelphia	59.44
Schuylkill	39.79



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



	January	February	March	April	May	June	July	August	September	October	November	December
Fent./ FRS/ NPSO	28	78	72	49	59	66	69	59	69	89	115	145
Heroin	44	66	70	70	74	73	75	64	66	72	81	107
Pres. Opi.	28	45	52	46	36	40	34	42	35	33	37	39
Benzos.	41	65	64	60	52	51	59	49	41	53	58	89
Ethanol	15	24	20	31	26	30	26	28	35	27	28	27
Cocaine	32	54	48	45	45	42	47	42	63	37	66	71
Other Illicit	9	6	7	8	12	18	8	10	23	15	16	22

Source: Pennsylvania Coroner/Medical Examiner Data

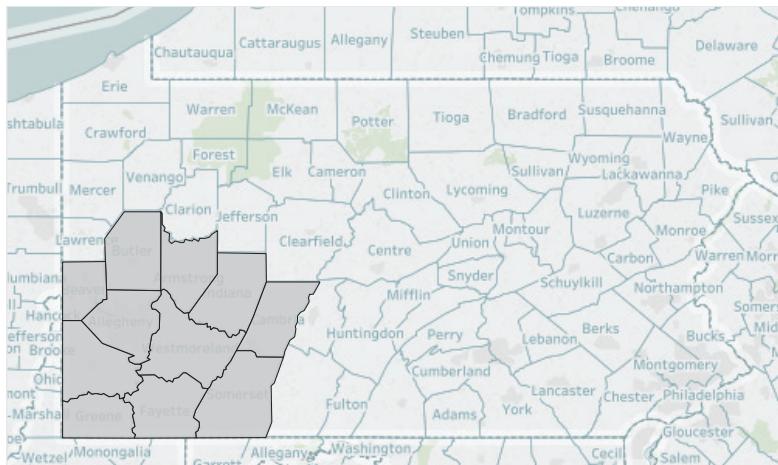
(U) Appendix Figure 9: Analysis of Overdose Death Data within District: Southwest District

Southwest District

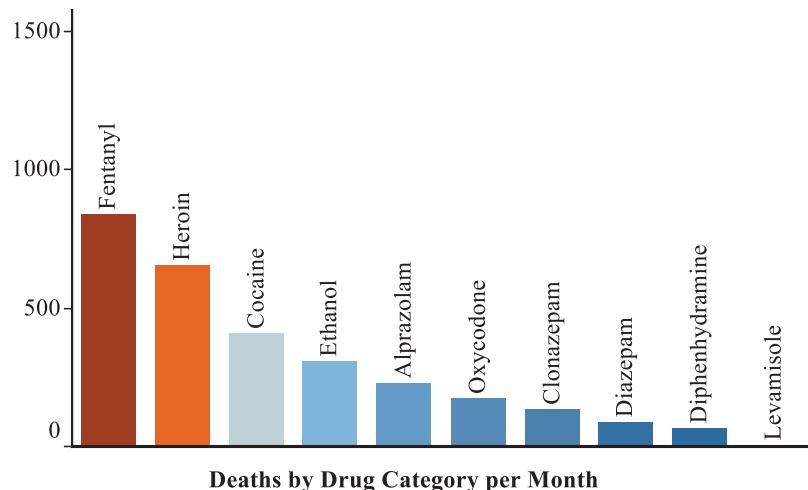
2016 Overdose Count: 1,384

2016 Overdose Rate

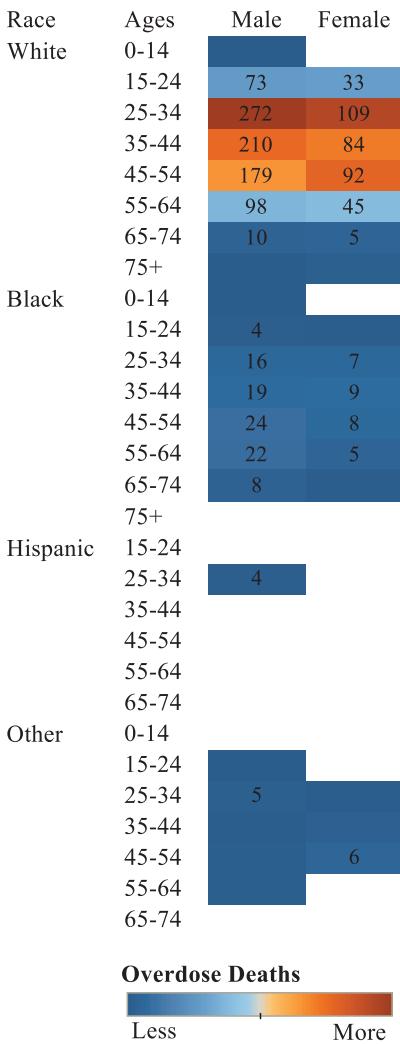
Allegheny	52.89
Armstrong	59.47
Beaver	59.81
Butler	40.25
Cambria	65.42
Fayette	43.92
Greene	49.11
Indiana	50.63
Somerset	27.01
Washington	51.01
Westmoreland	47.65



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



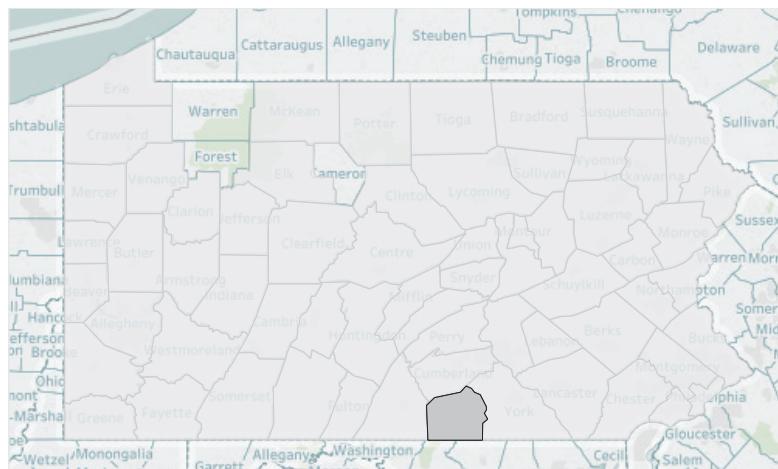
Source: Pennsylvania Coroner/Medical Examiner Data

Appendix

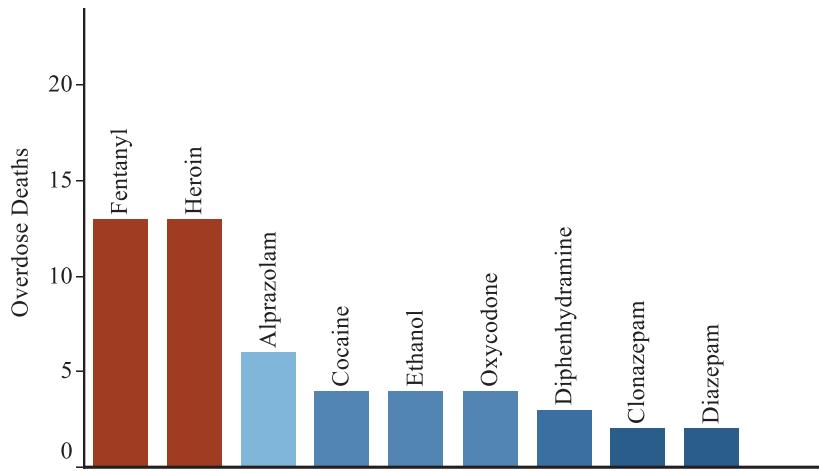
(U) Appendix Figure 10: Analysis of Overdose Death Data within County: Adams

Adams

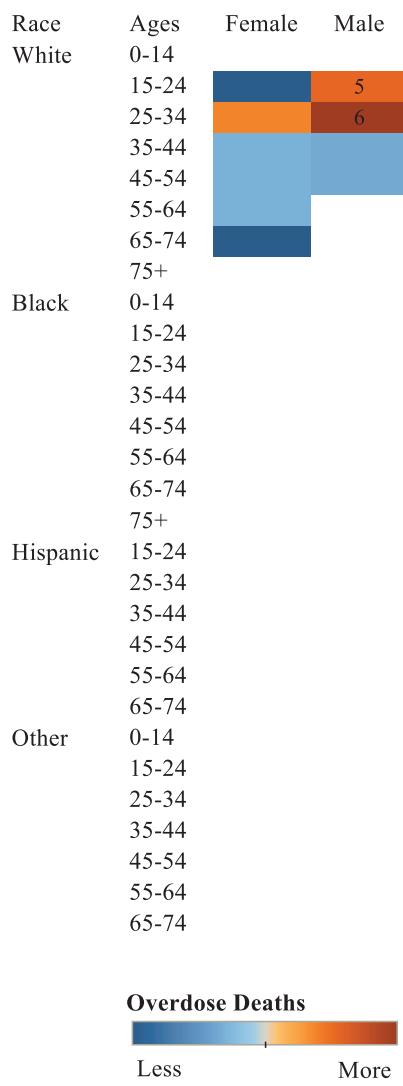
2016 Overdose Count: 28
2015 Overdose Count: 7
2016 Rank by Rate: 29
2016 Rank by Count: 31
2016 Rate: 27.61
Total Population: 101407



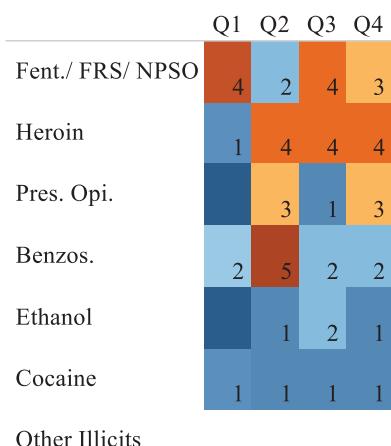
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter



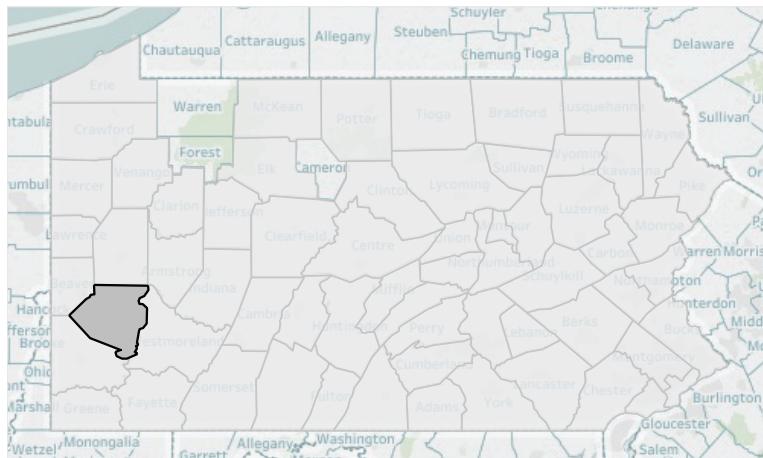
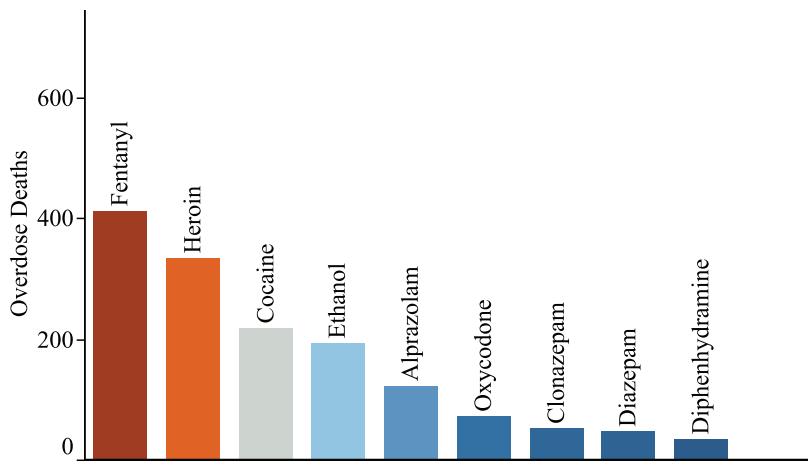
Percent Change from 2015 to 2016



(U) Appendix Figure 11: Analysis of Overdose Death Data within County: Allegheny

Allegheny

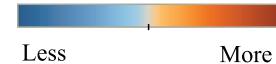
2016 Overdose Count: 648
2015 Overdose Count: 424
2016 Rank by Rate: 6
2016 Rank by Count: 2
2016 Rate: 52.97
Total Population: 1223348

**Top 10 Drugs Present in 2016 Accidental Drug-Related Overdose Deaths****Age, Race, and Gender Distribution of Overdose Deaths in 2016**

Race	Ages	Female	Male
White	0-14		
	15-24	14	24
	25-34	49	116
	35-44	36	96
	45-54	43	80
	55-64	23	54
	65-74	5	
	75+		
Black	0-14		
	15-24		
	25-34	5	12
	35-44	6	15
	45-54	7	21
	55-64	4	17
	65-74		7
	75+		
Hispanic	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
Other	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		

Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRC	35	62	120	213
Heroin	59	70	94	112
Pres. Opi.	16	31	35	51
Benzos.	32	43	54	72
Ethanol	25	30	52	87
Cocaine	27	42	57	94
Other Illicit	1	3	2	

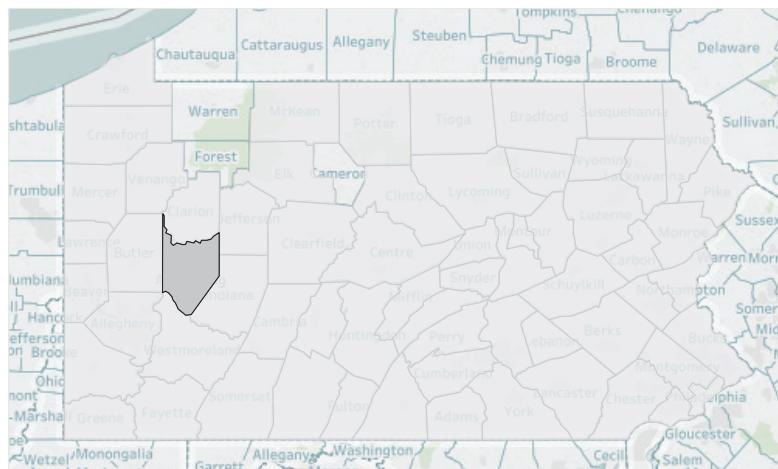
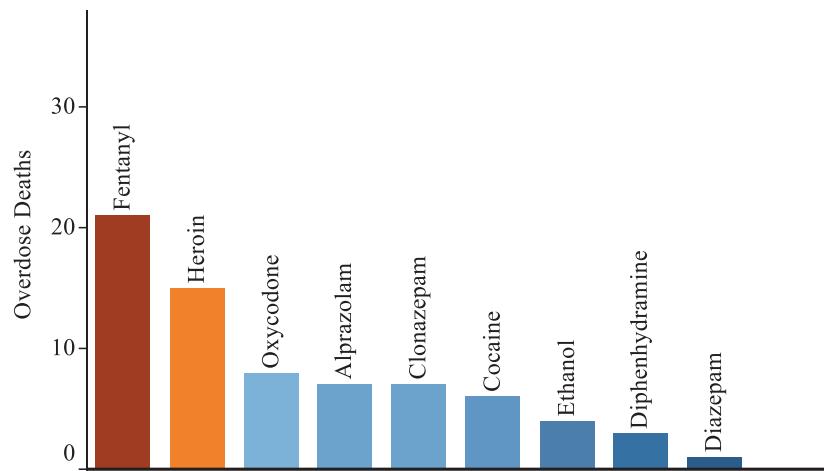
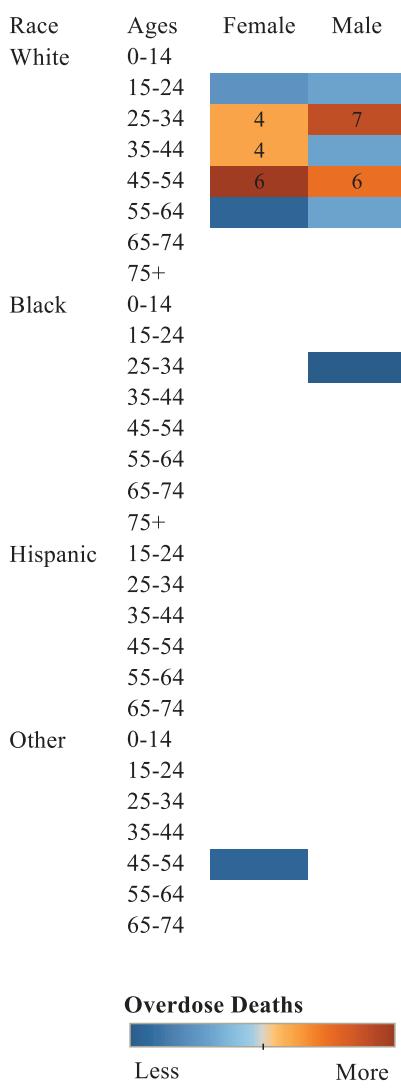
Percent Change from 2015 to 2016**Overdose Deaths**

Appendix

(U) Appendix Figure 12: Analysis of Overdose Death Data within County: Armstrong

Armstrong

2016 Overdose Count: 41
2015 Overdose Count: 29
2016 Rank by Rate: 4
2016 Rank by Count: 25
2016 Rate: 59.47
Total Population: 68941

**Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths****Age, Race, and Gender Distribution of Overdose Deaths in 2016****Deaths by Drug Category per Quarter**

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	2	3	8	8
Heroin	5	2	4	4
Pres. Opi.	3	5	2	5
Benzos.	3	1	2	8
Ethanol			3	1
Cocaine		2	1	3
Other Ilicit				

Percent Change from 2015 to 2016

(U) Appendix Figure 13: Analysis of Overdose Death Data within County: Beaver

Beaver

2016 Overdose Count: 102

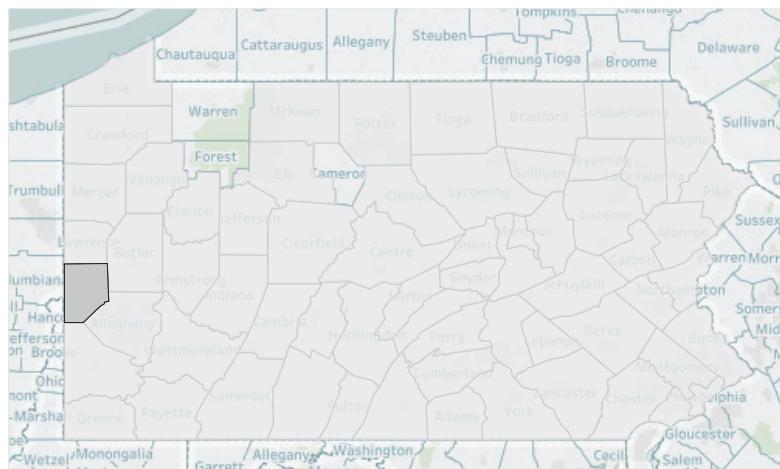
2015 Overdose Count: 37

2016 Rank by Rate: 3

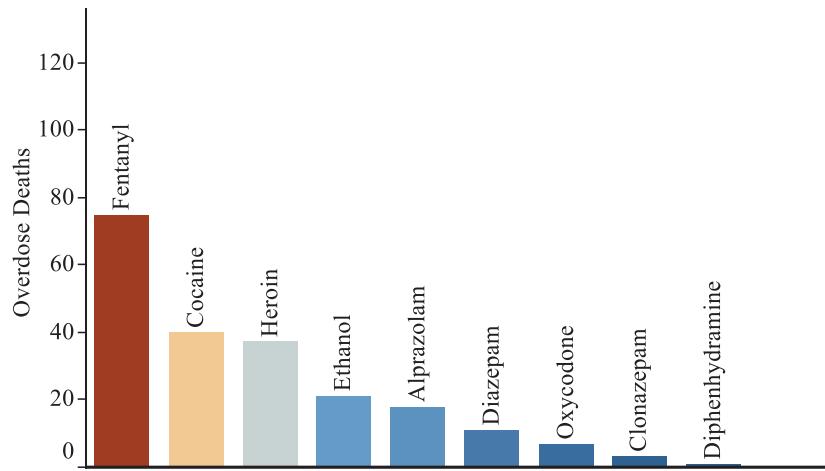
2016 Rank by Count: 13

2016 Rate: 59.81

Total Population: 170539



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



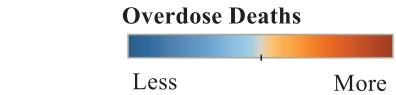
Age, Race, and Gender Distribution of Overdose Deaths in 2016

Race	Ages	Female	Male
White	0-14		
	15-24	5	
	25-34	10	27
	35-44	6	17
	45-54	7	10
	55-64		9
	65-74		
	75+		

Black	0-14	
	15-24	
	25-34	
	35-44	
	45-54	
	55-64	
	65-74	
	75+	

Hispanic	15-24	
	25-34	
	35-44	
	45-54	
	55-64	
	65-74	
	75+	

Other	0-14	
	15-24	
	25-34	
	35-44	
	45-54	
	55-64	
	65-74	



Source: Pennsylvania Coroner/Medical Examiner Data

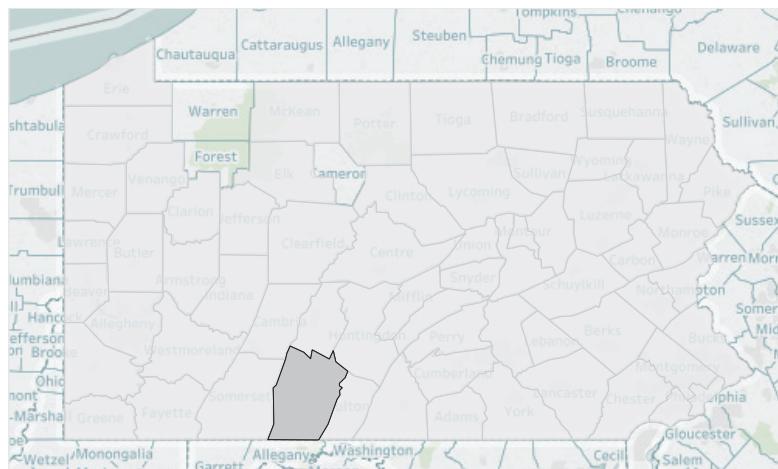
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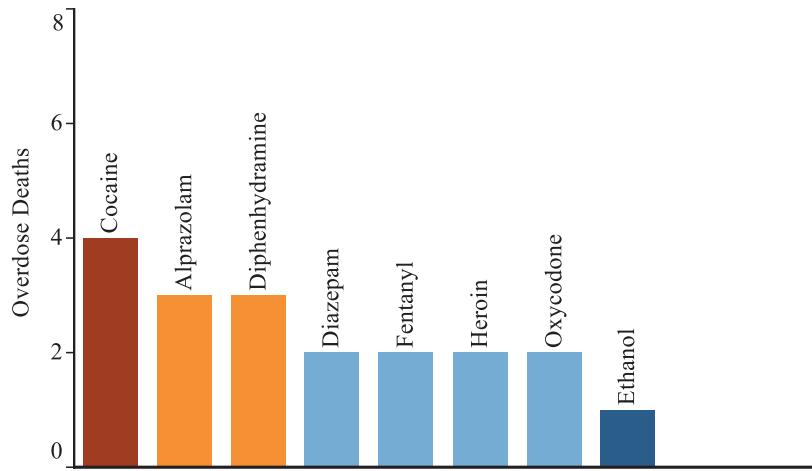
(U) Appendix Figure 14: Analysis of Overdose Death Data within County: Bedford

Bedford

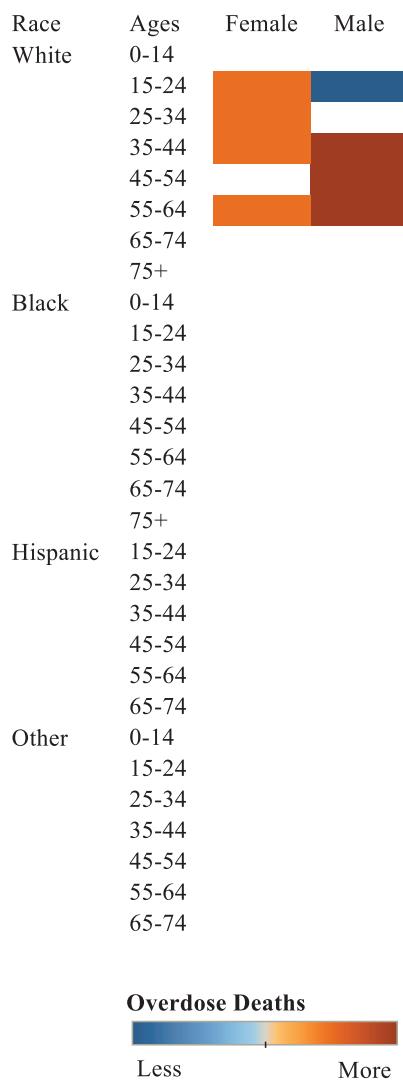
2016 Overdose Count: 11
2015 Overdose Count: 6
2016 Rank by Rate: 44
2016 Rank by Count: 39
2016 Rate: 22.11
Total Population: 49762



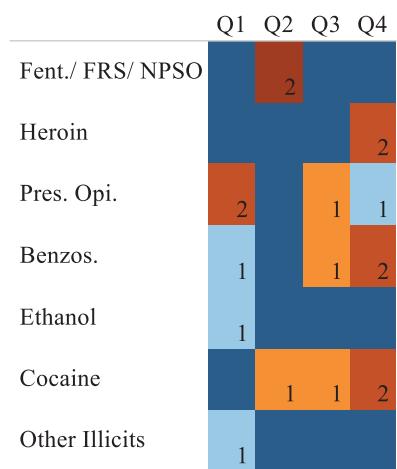
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter



Percent Change from 2015 to 2016



(U) Appendix Figure 15: Analysis of Overdose Death Data within County: Berks

Berks

2016 Overdose Count: 117

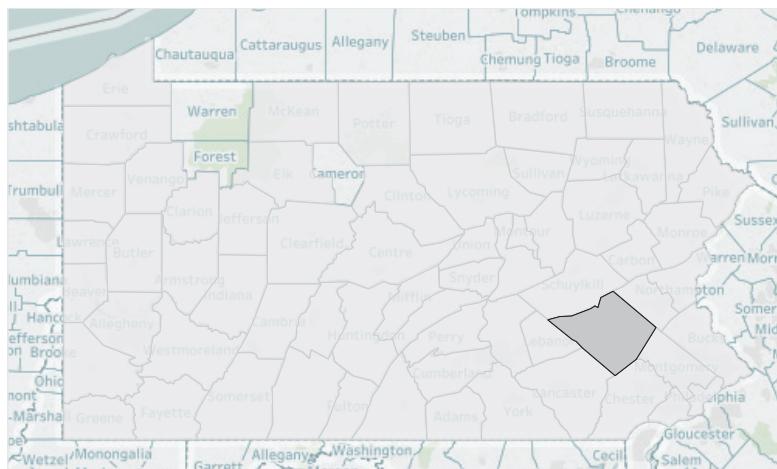
2015 Overdose Count: 69

2016 Rank by Rate: 28

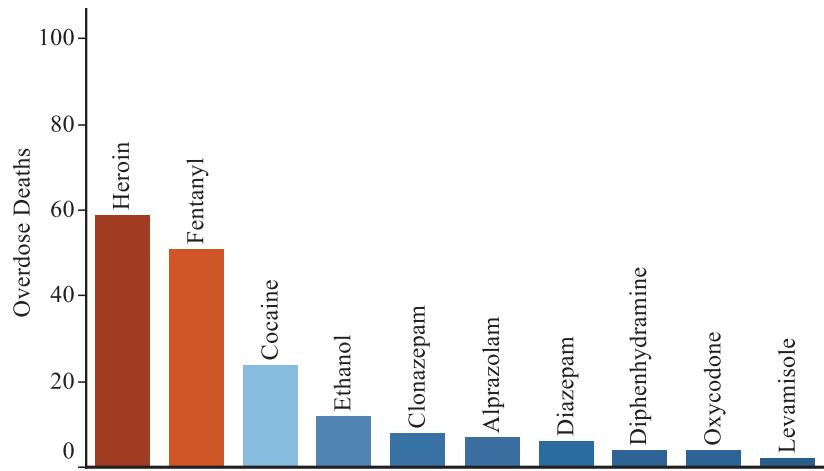
2016 Rank by Count: 10

2016 Rate: 28.44

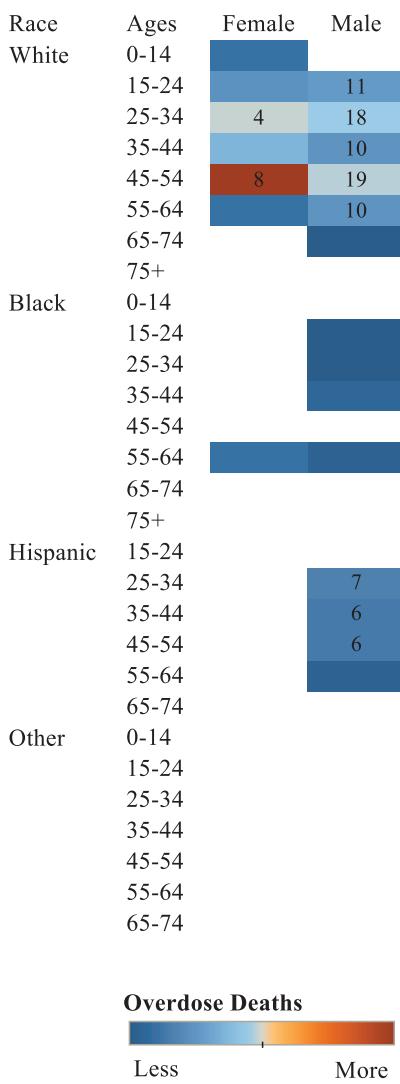
Total Population: 411442



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	6	12	14	20
Heroin	10	15	8	26
Pres. Opi.	1	2	4	3
Benzos.	5	7	1	6
Ethanol	2	4	4	2
Cocaine	4	4	7	9
Other Illicit	2	2	2	2

Percent Change from 2015 to 2016



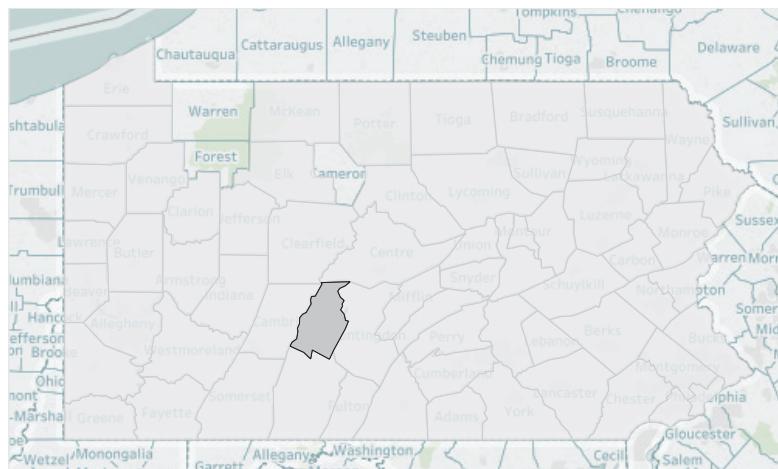
Source: Pennsylvania Coroner/Medical Examiner Data

Appendix

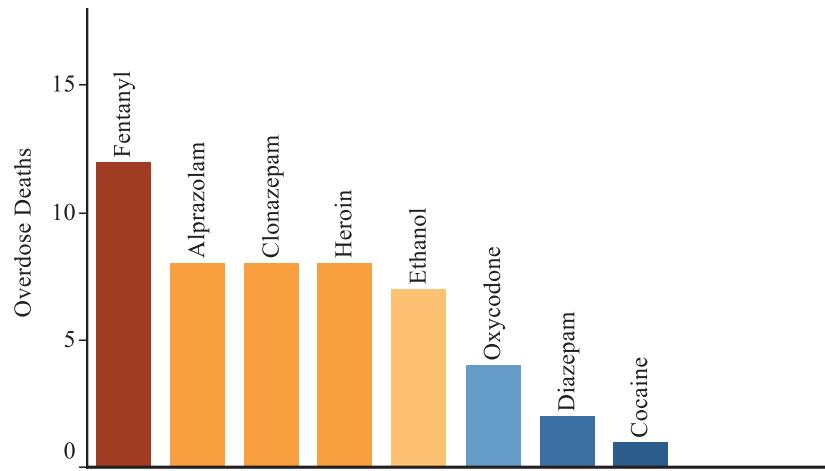
(U) Appendix Figure 16: Analysis of Overdose Death Data within County: Blair

Blair

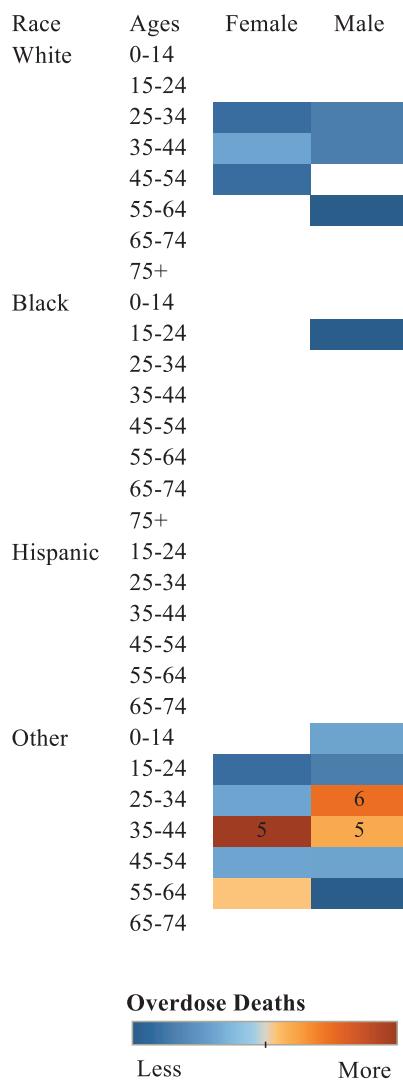
2016 Overdose Count: 43
2015 Overdose Count: 22
2016 Rank by Rate: 20
2016 Rank by Count: 24
2016 Rate: 33.83
Total Population: 127089



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	3	5	1	3
Heroin	3	2		3
Pres. Opi.	4	4	3	1
Benzos.	8	3	2	2
Ethanol	1	1	3	2
Cocaine	1			
Other Illicit	1	1		

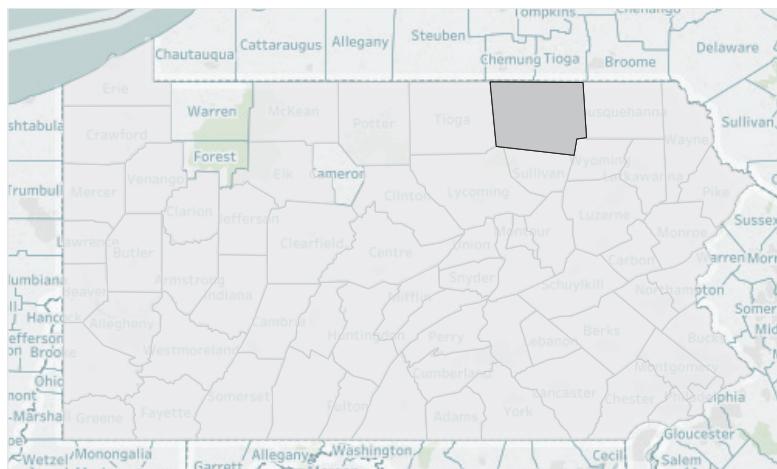
Percent Change from 2015 to 2016



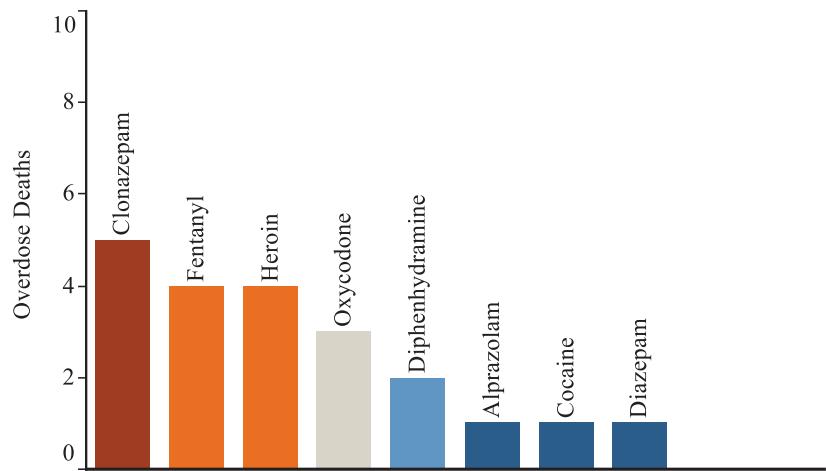
(U) Appendix Figure 17: Analysis of Overdose Death Data within County: Bradford

Bradford

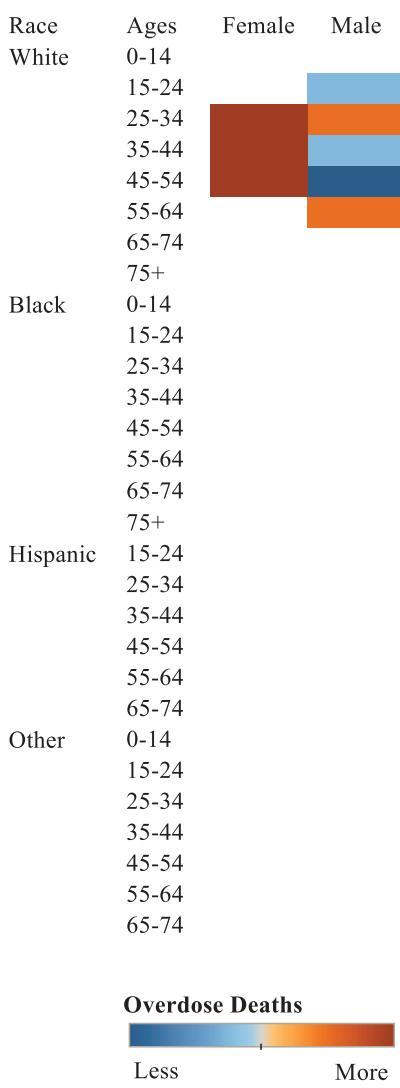
2016 Overdose Count: 17
2015 Overdose Count: 16
2016 Rank by Rate: 31
2016 Rank by Count: 37
2016 Rate: 27.15
Total Population: 62622



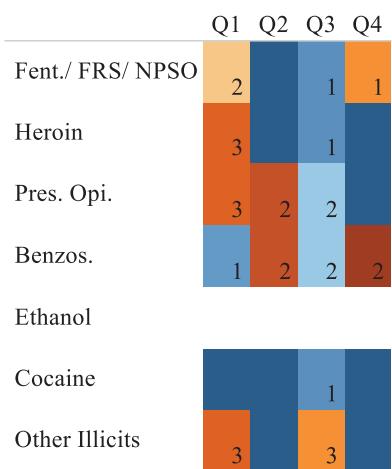
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter



Percent Change from 2015 to 2016

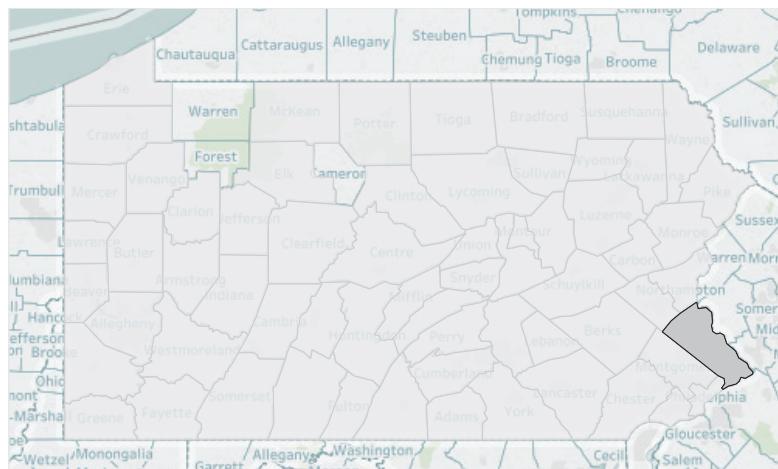


Appendix

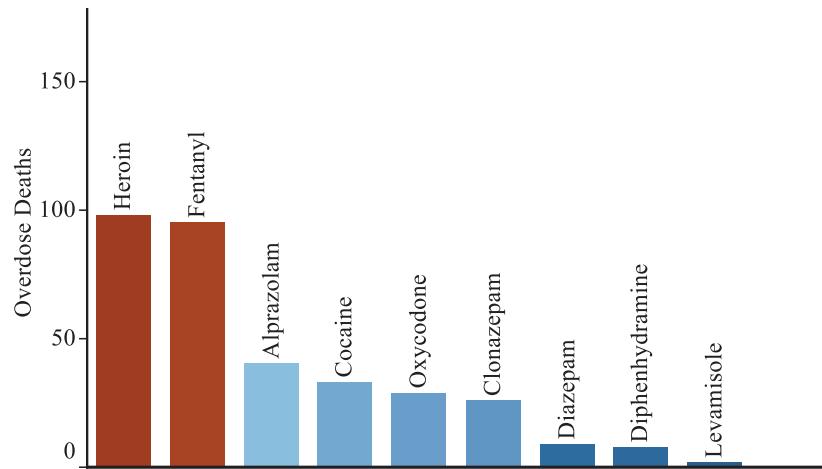
(U) Appendix Figure 18: Analysis of Overdose Death Data within County: Bucks

Bucks

2016 Overdose Count: 168
2015 Overdose Count: 117
2016 Rank by Rate: 33
2016 Rank by Count: 6
2016 Rate: 26.87
Total Population: 625249



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



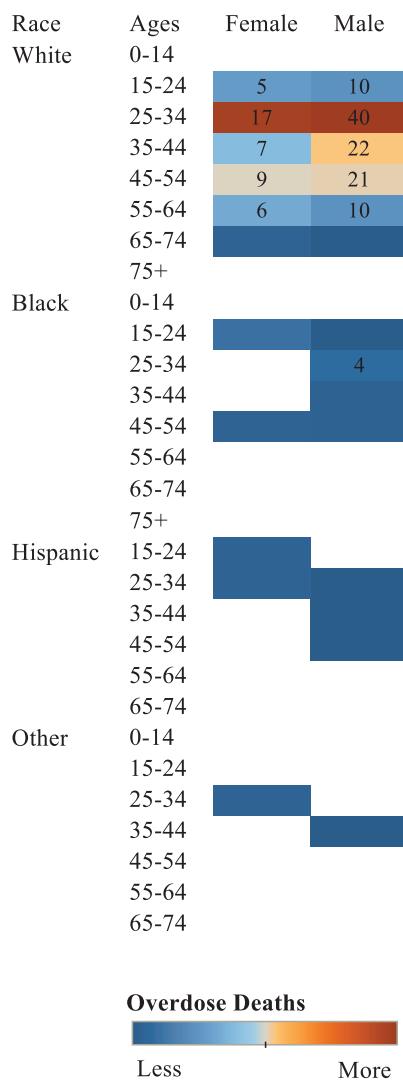
Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	16	16	19	46
Heroin	17	24	25	32
Pres. Opi.	15	10	9	9
Benzos.	13	12	11	29
Ethanol				
Cocaine	14	2	7	10
Other Illicit	4	6	3	7

Percent Change from 2015 to 2016



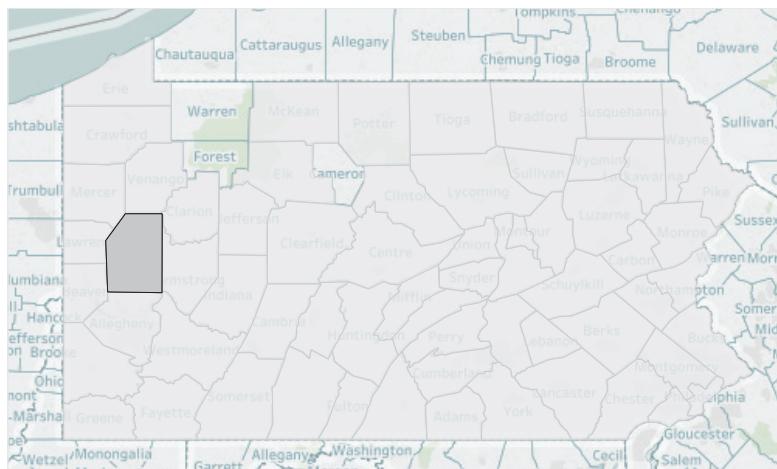
Age, Race, and Gender Distribution of Overdose Deaths in 2016



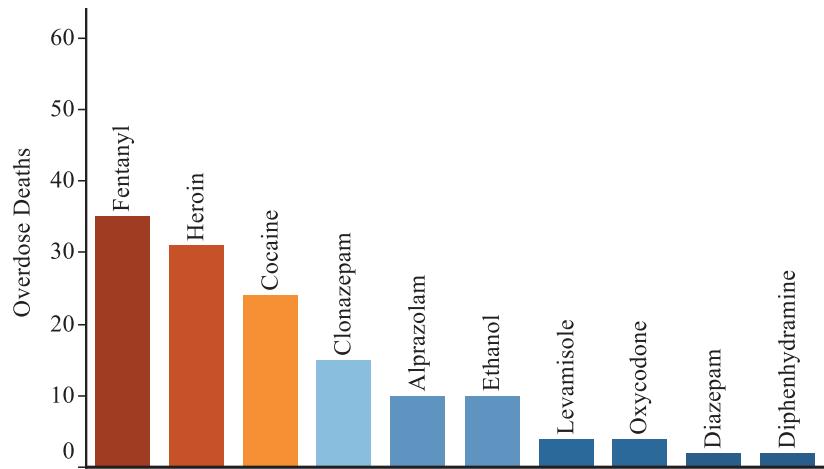
(U) Appendix Figure 19: Analysis of Overdose Death Data within County: Butler

Butler

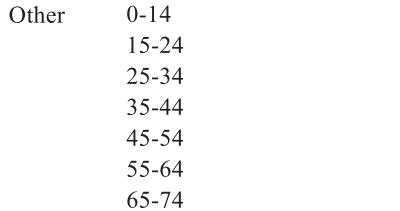
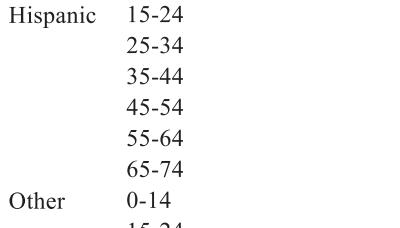
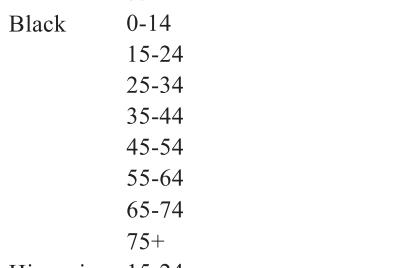
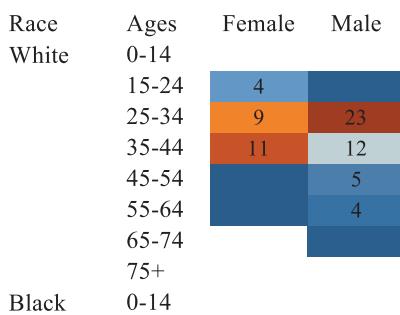
2016 Overdose Count: 74
2015 Overdose Count: 47
2016 Rank by Rate: 14
2016 Rank by Count: 18
2016 Rate: 40.25
Total Population: 183862



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	3	7	12	19
Heroin	9	6	9	7
Pres. Opi.	3	1	5	2
Benzos.	5	9	8	7
Ethanol	1	4	2	3
Cocaine	5	2	6	11
Other Illicit		1		

Percent Change from 2015 to 2016



Source: Pennsylvania Coroner/Medical Examiner Data

Appendix

(U) Appendix Figure 20: Analysis of Overdose Death Data within County: Cambria

Cambria

2016 Overdose Count: 94

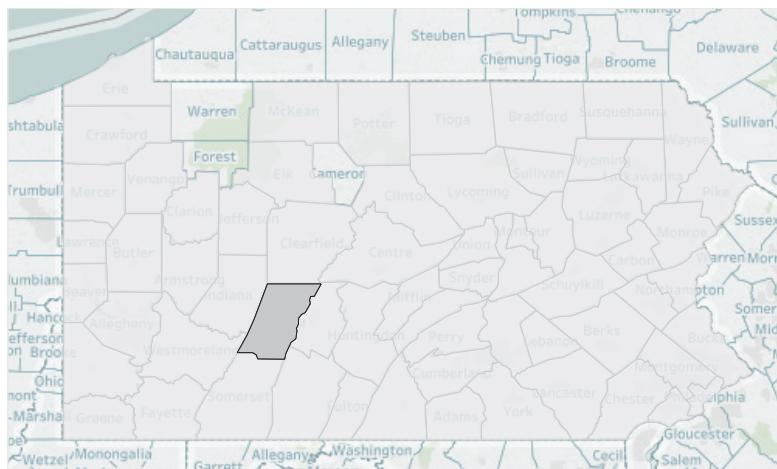
2015 Overdose Count: 58

2016 Rank by Rate: 2

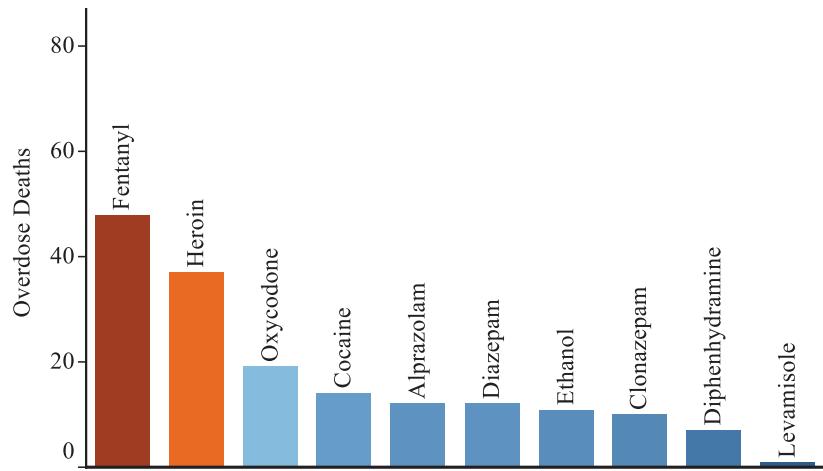
2016 Rank by Count: 15

2016 Rate: 65.42

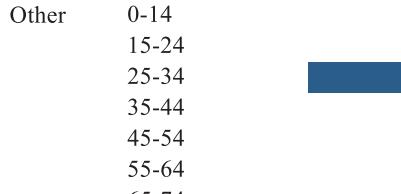
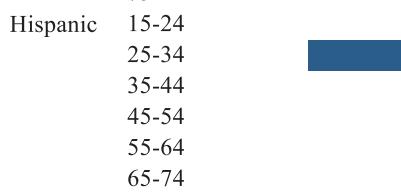
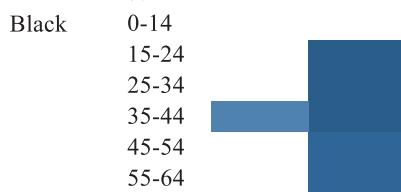
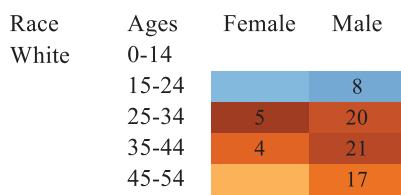
Total Population: 143679



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	9	6	12	22
Heroin	9	11	10	7
Pres. Opi.	12	5	11	8
Benzos.	3	12	15	
Ethanol	4	3	3	4
Cocaine	1	3	4	6
Other Illicit				

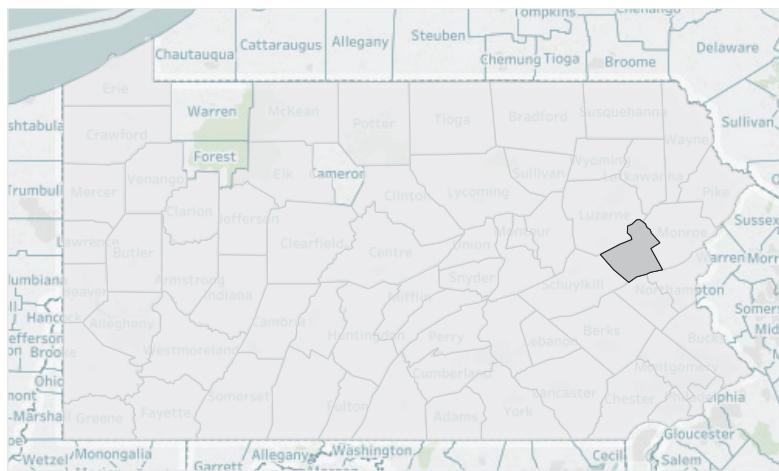
Percent Change from 2015 to 2016



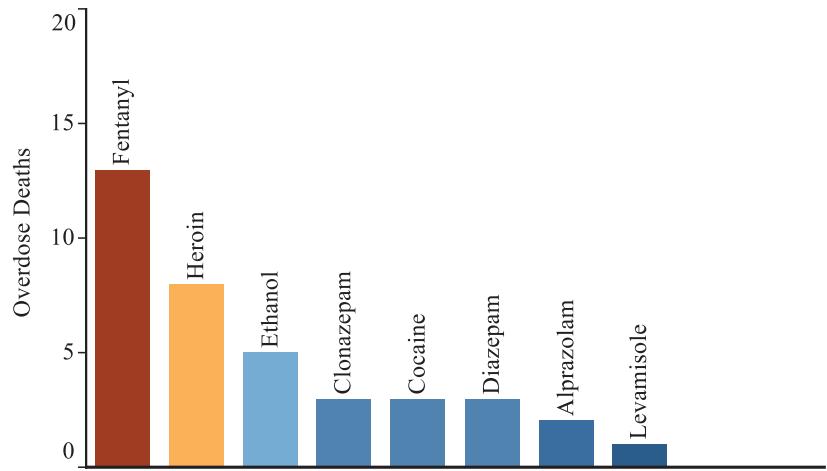
(U) Appendix Figure 21: Analysis of Overdose Death Data within County: Carbon

Carbon

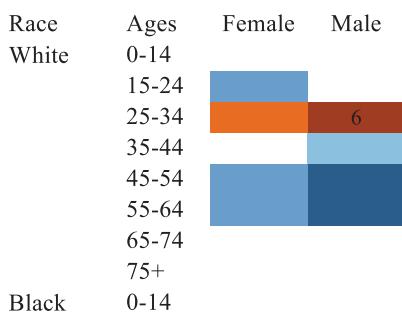
2016 Overdose Count: 17
2015 Overdose Count: 18
2016 Rank by Rate: 37
2016 Rank by Count: 37
2016 Rate: 26.05
Total Population: 65249



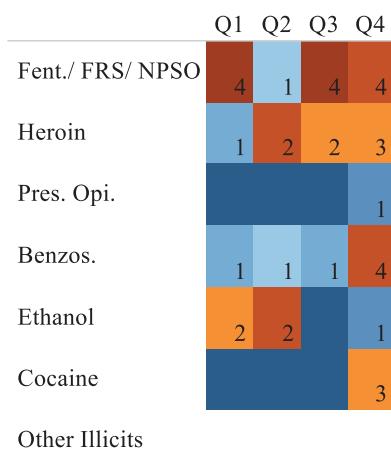
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



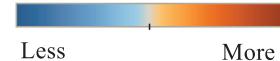
Deaths by Drug Category per Quarter



Percent Change from 2015 to 2016



Overdose Deaths



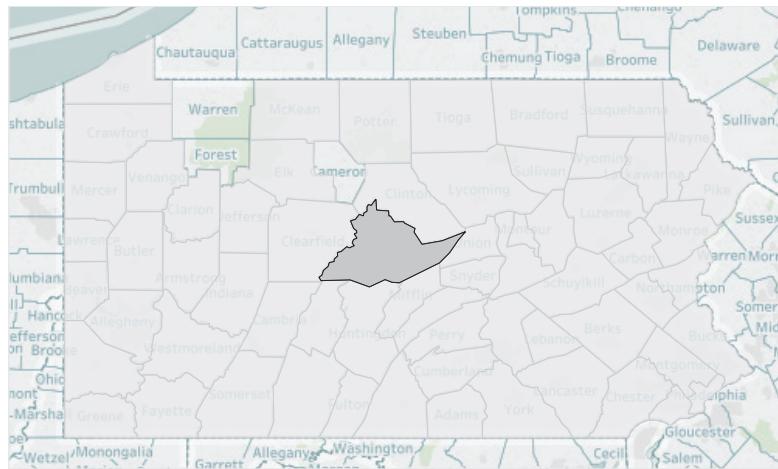
Source: Pennsylvania Coroner/Medical Examiner Data

Appendix

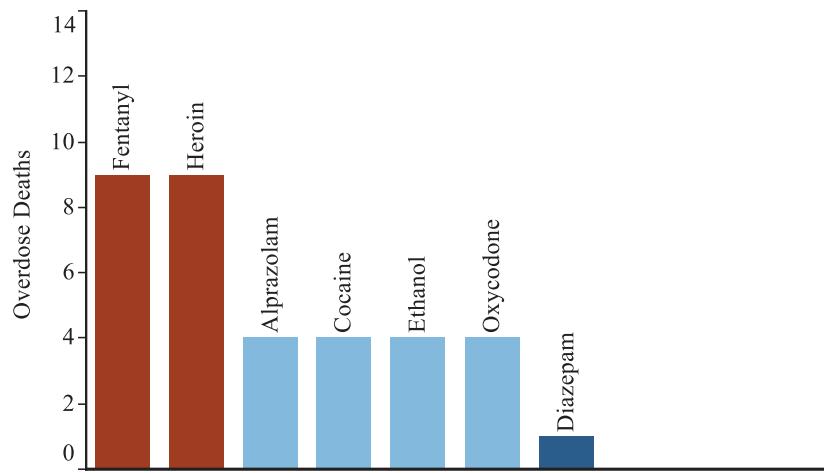
(U) Appendix Figure 22: Analysis of Overdose Death Data within County: Centre

Centre

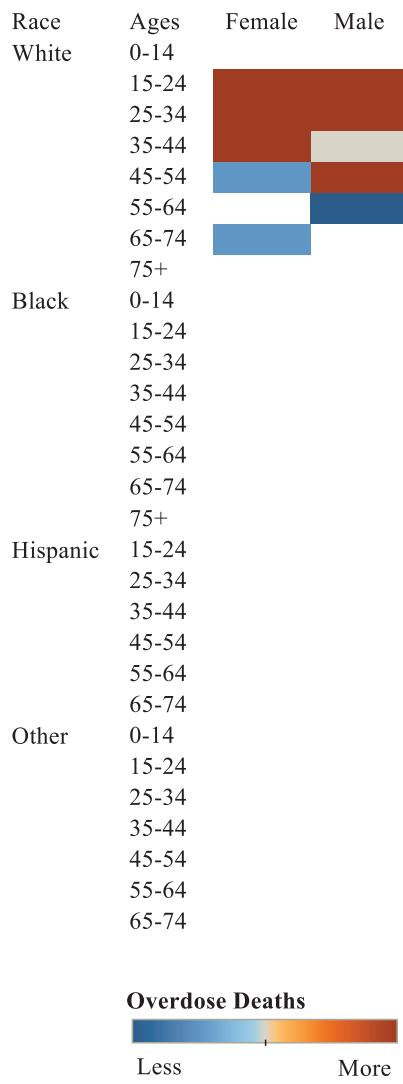
2016 Overdose Count: 20
2015 Overdose Count: 15
2016 Rank by Rate: 59
2016 Rank by Count: 34
2016 Rate: 12.99
Total Population: 153990



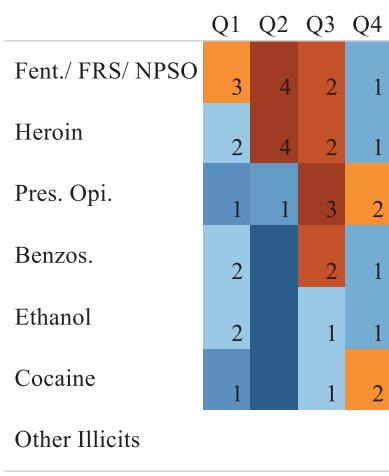
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter



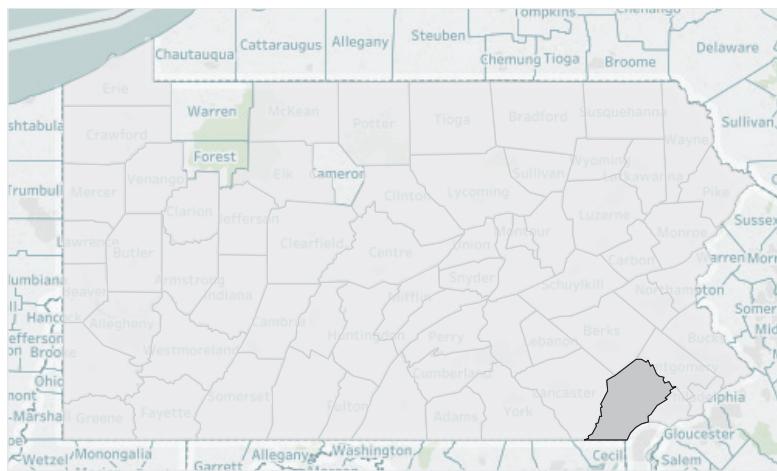
Percent Change from 2015 to 2016



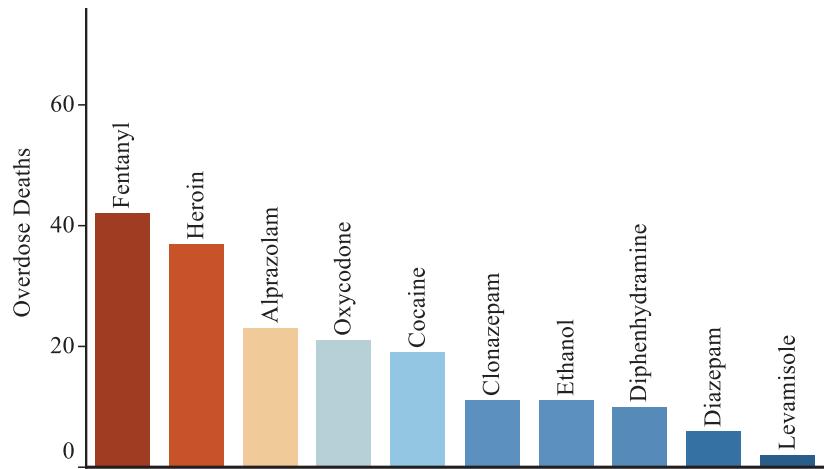
(U) Appendix Figure 23: Analysis of Overdose Death Data within County: Chester

Chester

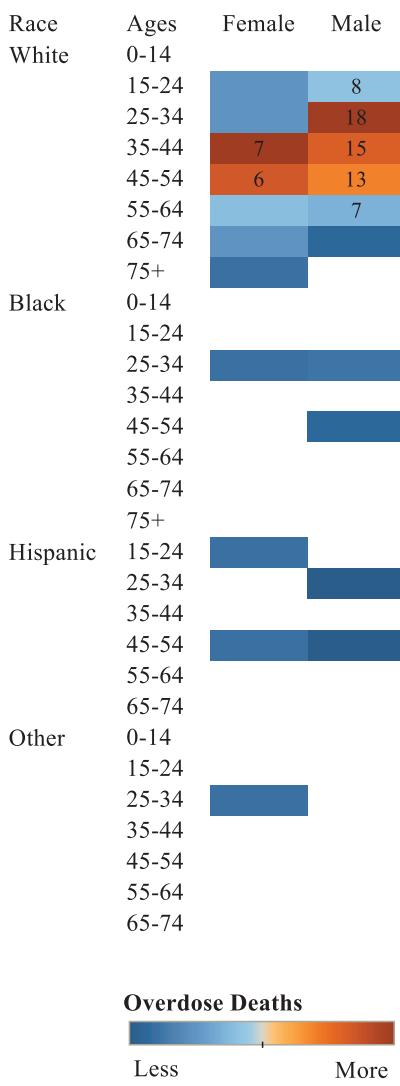
2016 Overdose Count: 97
2015 Overdose Count: 63
2016 Rank by Rate: 46
2016 Rank by Count: 14
2016 Rate: 19.44
Total Population: 498886



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	8	11	5	19
Heroin	10	9	5	13
Pres. Opi.	7	7	5	13
Benzos.	16	10	6	14
Ethanol	2	1	3	5
Cocaine	4	5	5	5
Other Illicit	1	1	2	3

Percent Change from 2015 to 2016

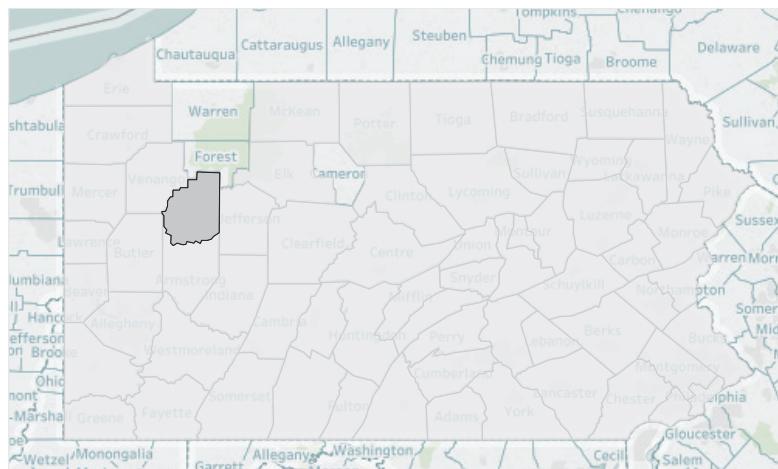
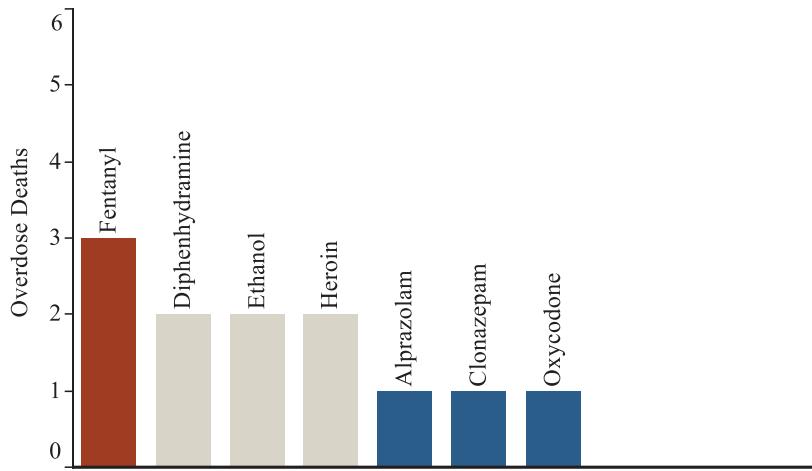
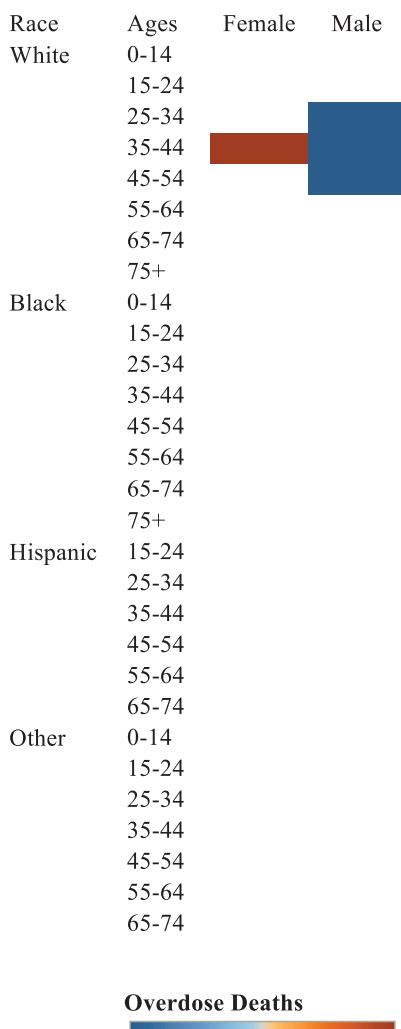
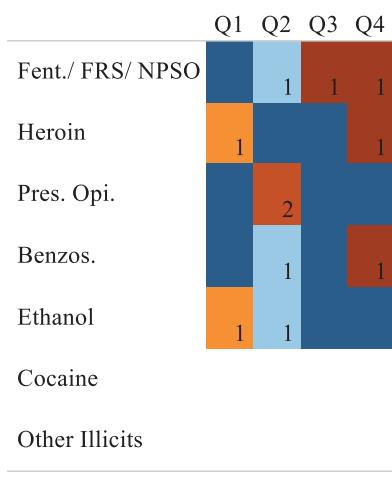


Appendix

(U) Appendix Figure 24: Analysis of Overdose Death Data within County: Clarion

Clarion

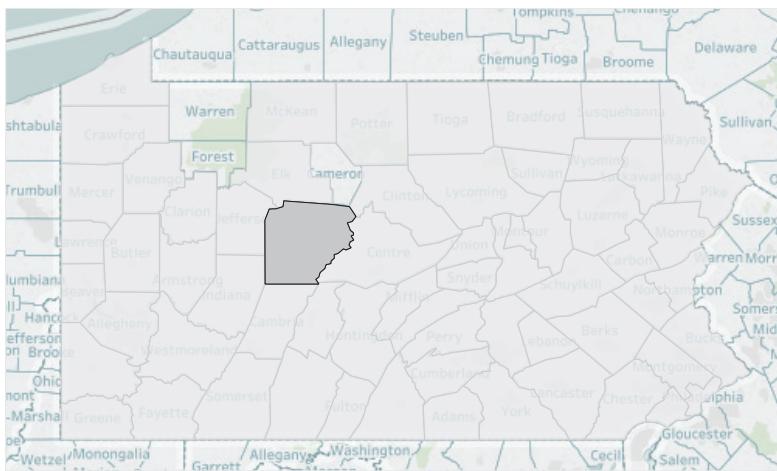
2016 Overdose Count: 7
2015 Overdose Count: 4
2016 Rank by Rate: 48
2016 Rank by Count: 43
2016 Rate: 17.51
Total Population: 39988

**Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths****Age, Race, and Gender Distribution of Overdose Deaths in 2016****Deaths by Drug Category per Quarter****Percent Change from 2015 to 2016**

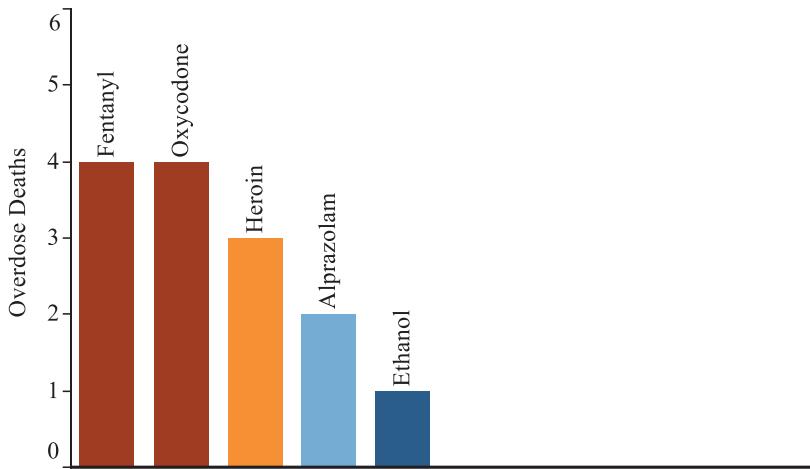
(U) Appendix Figure 25: Analysis of Overdose Death Data within County: Clearfield

Clearfield

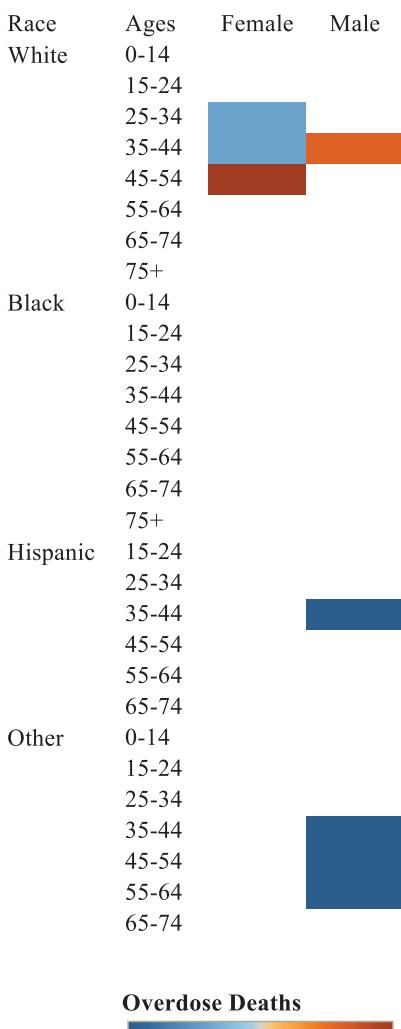
2016 Overdose Count: 11
2015 Overdose Count: 13
2016 Rank by Rate: 58
2016 Rank by Count: 39
2016 Rate: 13.47
Total Population: 81642



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	1	1	1	2
Heroin	1	1	1	1
Pres. Opi.	2	2	3	
Benzos.	1	1	1	
Ethanol	1			
Cocaine				
Other Illicit				

Percent Change from 2015 to 2016



Appendix

(U) Appendix Figure 26: Analysis of Overdose Death Data within County: Clinton

Clinton

2016 Overdose Count: 10

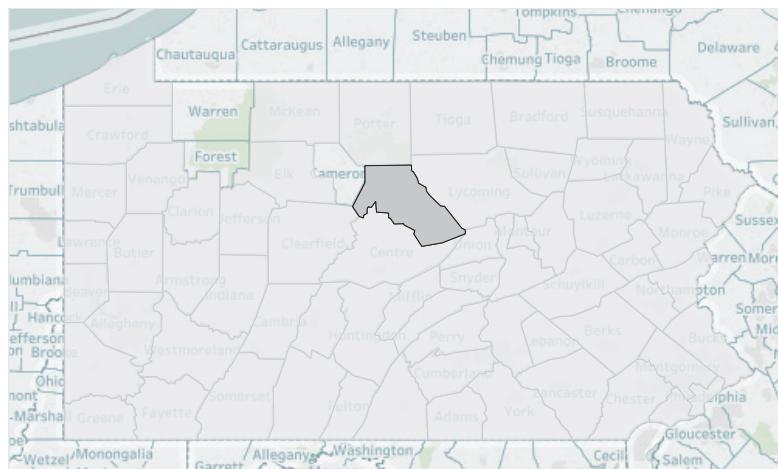
2015 Overdose Count: 4

2016 Rank by Rate: 38

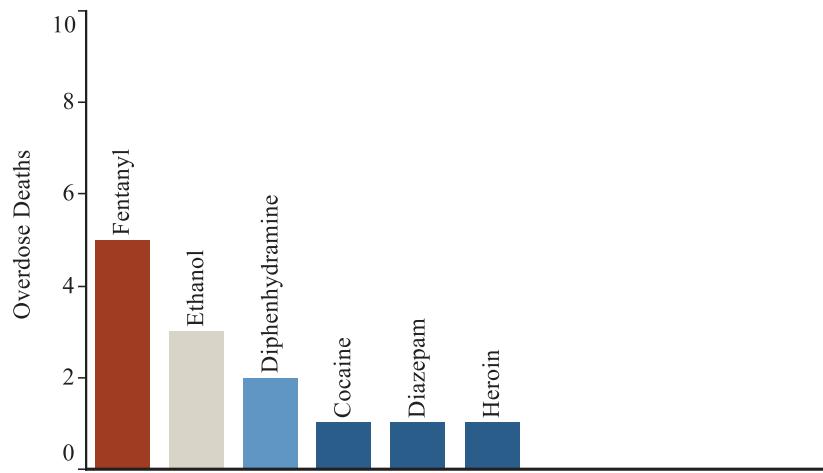
2016 Rank by Count: 40

2016 Rate: 25.49

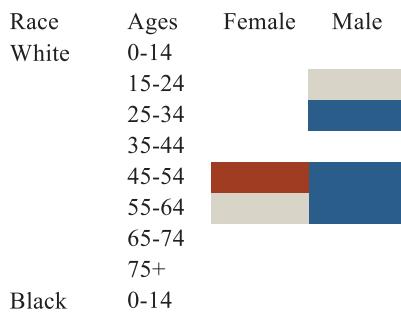
Total Population: 39238



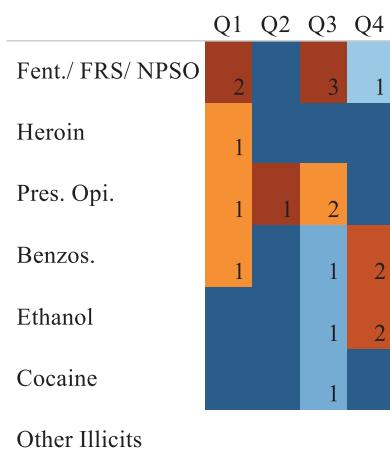
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter



Percent Change from 2015 to 2016



Hispanic

Other

Overdose Deaths

Less More

(U) Appendix Figure 27: Analysis of Overdose Death Data within County: Columbia

Columbia

2016 Overdose Count: 18

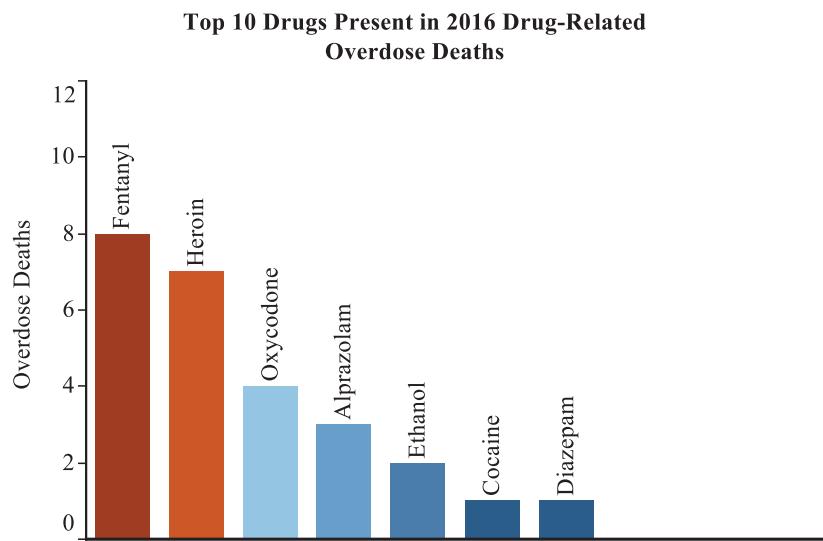
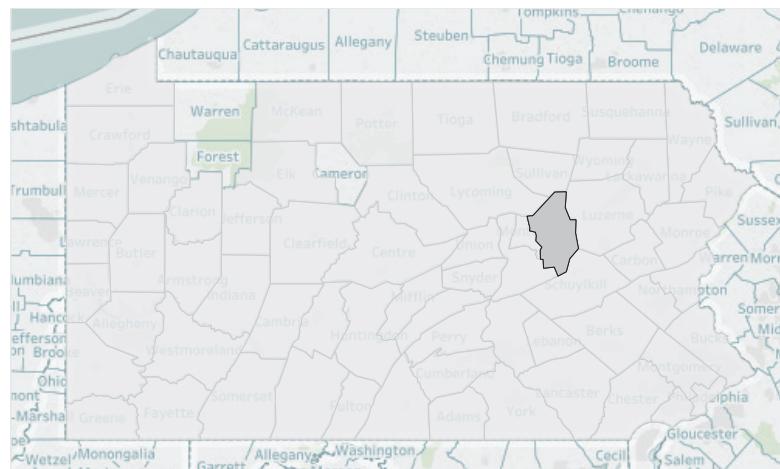
2015 Overdose Count: 16

2016 Rank by Rate: 34

2016 Rank by Count: 36

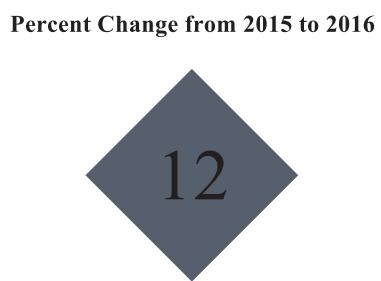
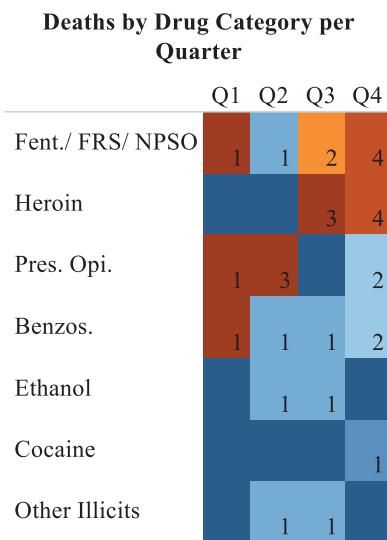
2016 Rate: 26.75

Total Population: 67295



A treemap chart illustrating the distribution of the US population by race and age group. The total population is represented by a large orange square at the top right. The population is broken down by race (White, Black, Hispanic, Other) and age group (0-14, 15-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75+). The size of each colored rectangle corresponds to its relative percentage of the total population.

Race	Ages	Female	Male
White	0-14		
White	15-24		
White	25-34		
White	35-44		
White	45-54	5	
White	55-64		
White	65-74		
White	75+		
Black	0-14		
Black	15-24		
Black	25-34		
Black	35-44		
Black	45-54		
Black	55-64		
Black	65-74		
Black	75+		
Hispanic	15-24		
Hispanic	25-34		
Hispanic	35-44		
Hispanic	45-54		
Hispanic	55-64		
Hispanic	65-74		
Other	0-14		
Other	15-24		
Other	25-34		
Other	35-44		
Other	45-54		
Other	55-64		
Other	65-74		



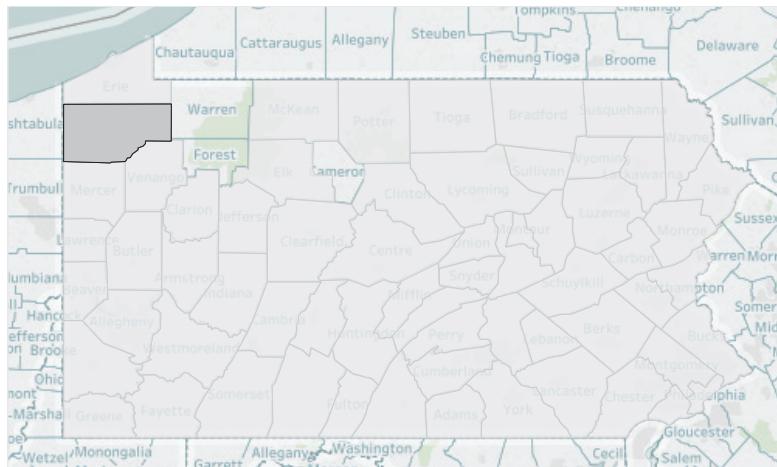
Source: Pennsylvania Coroner/Medical Examiner Data

Appendix

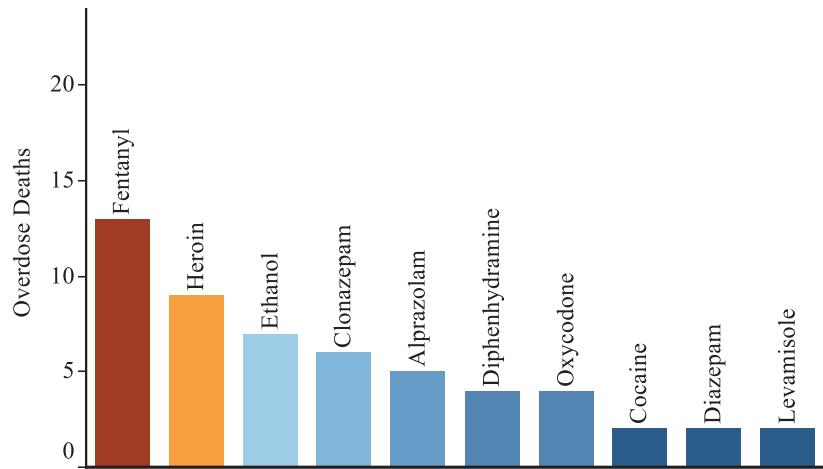
(U) Appendix Figure 28: Analysis of Overdose Death Data within County: Crawford

Crawford

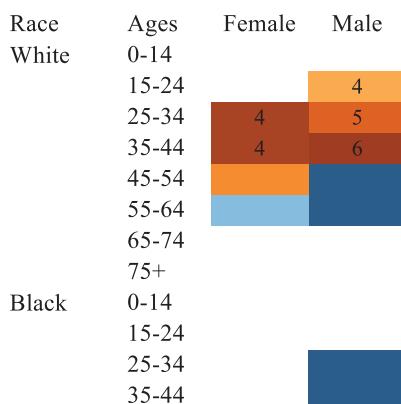
2016 Overdose Count: 32
2015 Overdose Count: 28
2016 Rank by Rate: 19
2016 Rank by Count: 29
2016 Rate: 36.05
Total Population: 88765



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



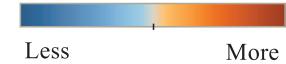
Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	3	2	4	4
Heroin	5	1	2	1
Pres. Opi.	3	1	2	5
Benzos.	4	2	4	3
Ethanol	4	1	1	1
Cocaine	2			
Other Illicit				

Percent Change from 2015 to 2016



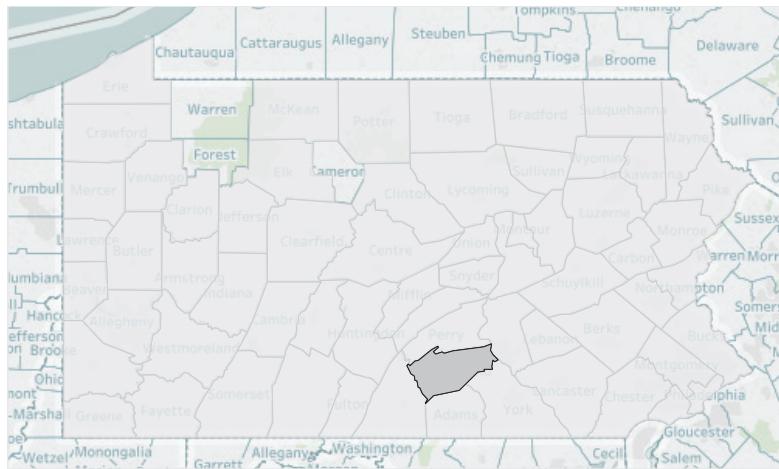
Overdose Deaths



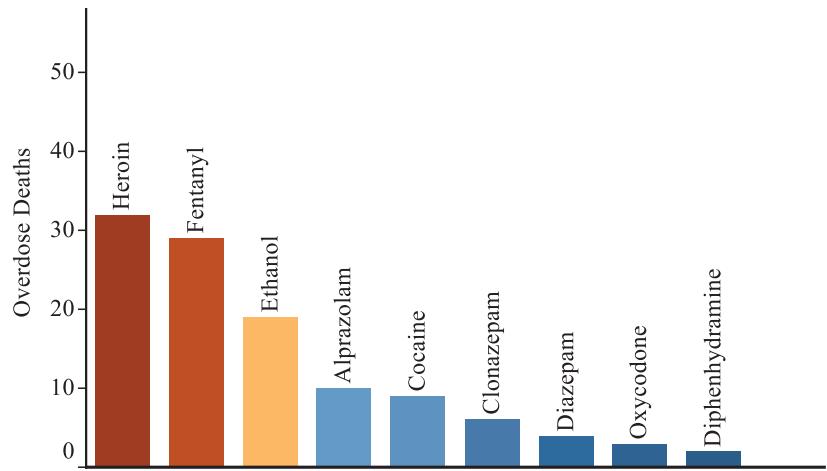
(U) Appendix Figure 29: Analysis of Overdose Death Data within County: Cumberland

Cumberland

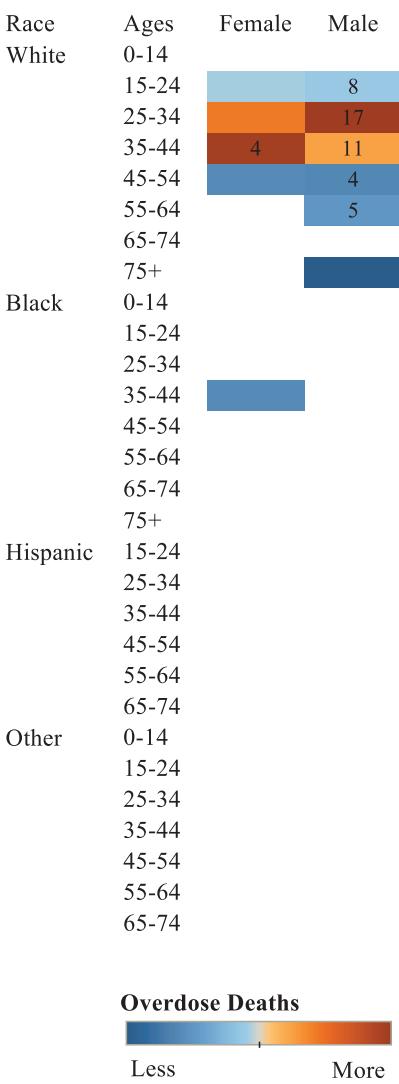
2016 Overdose Count: 58
2015 Overdose Count: 41
2016 Rank by Rate: 40
2016 Rank by Count: 22
2016 Rate: 24.64
Total Population: 235406



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	5	7	8	11
Heroin	11	6	4	11
Pres. Opi.	4	1	2	3
Benzos.	4	4	3	6
Ethanol	2	2	8	7
Cocaine	2		1	6
Other Illicit				1

Percent Change from 2015 to 2016



Appendix

(U) Appendix Figure 30: Analysis of Overdose Death Data within County: Dauphin

Dauphin

2016 Overdose Count: 84

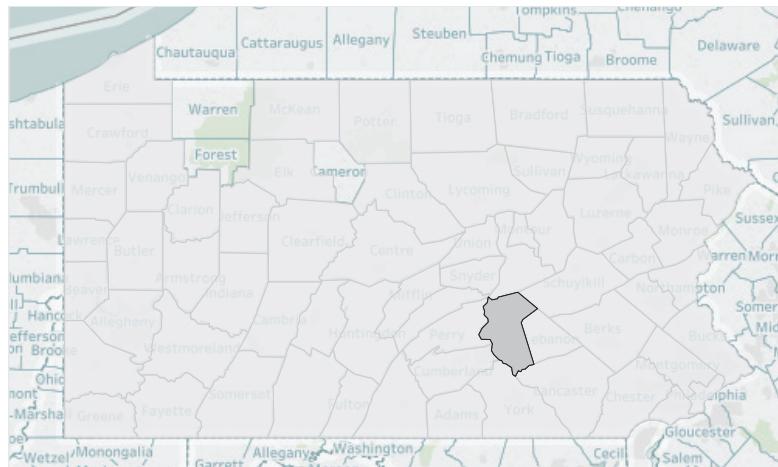
2015 Overdose Count: 82

2016 Rank by Rate: 23

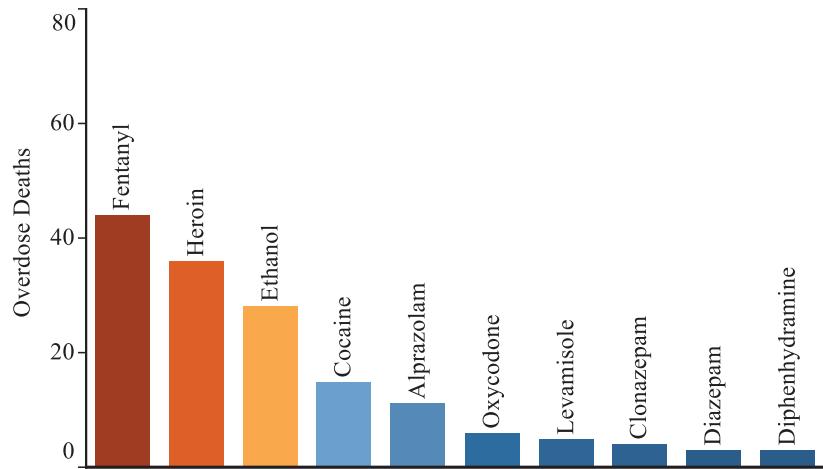
2016 Rank by Count: 17

2016 Rate: 31.33

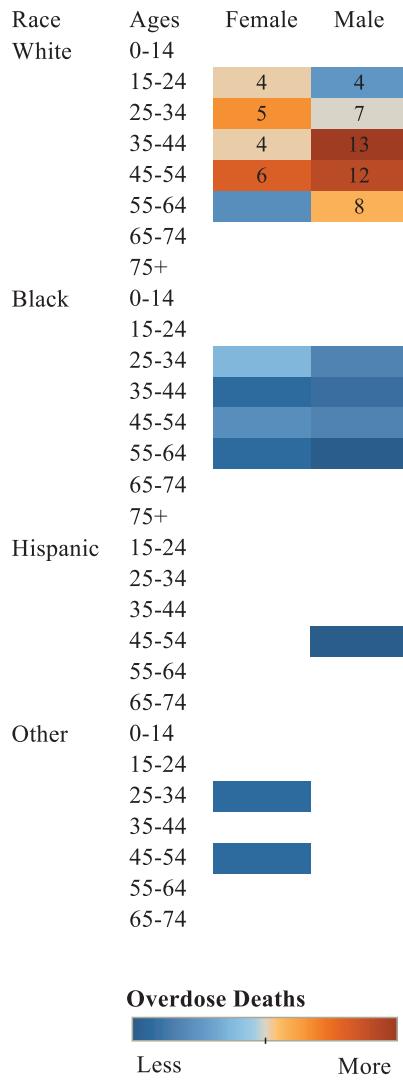
Total Population: 268100



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	4	8	17	18
Heroin	4	8	11	13
Pres. Opi.	4	6	3	3
Benzos.	6	5	5	3
Ethanol	6	8	7	7
Cocaine	2	2	7	6
Other Illicit	2	2		

Percent Change from 2015 to 2016



(U) Appendix Figure 31: Analysis of Overdose Death Data within County: Delaware

Delaware

2016 Overdose Count: 206

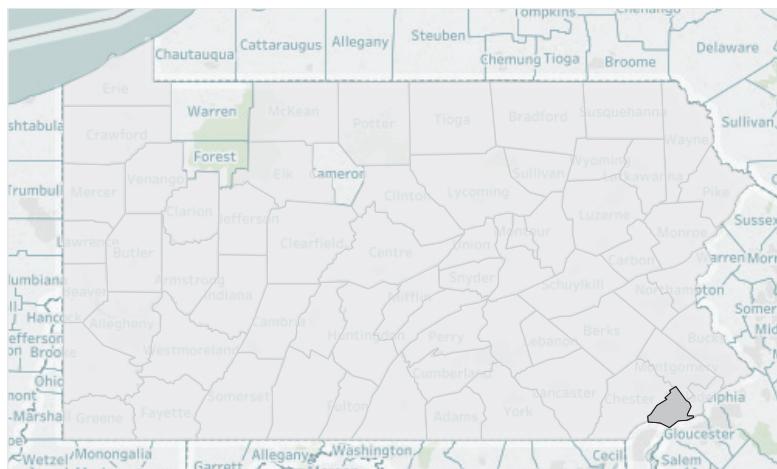
2015 Overdose Count: 202

2016 Rank by Rate: 18

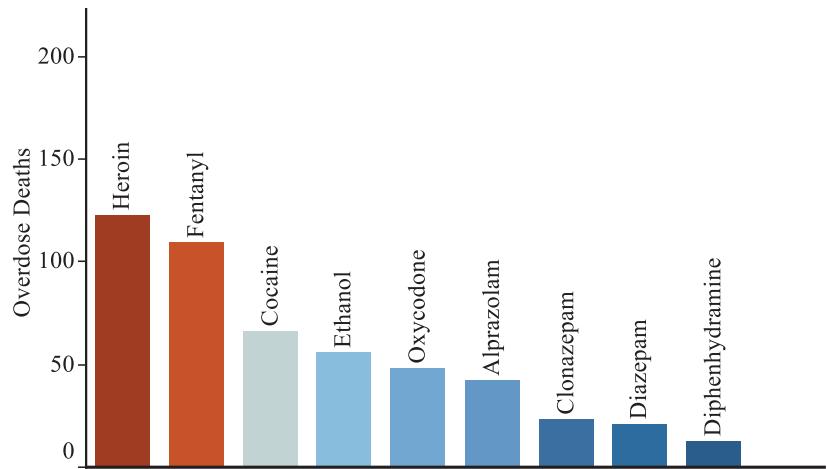
2016 Rank by Count: 4

2016 Rate: 36.85

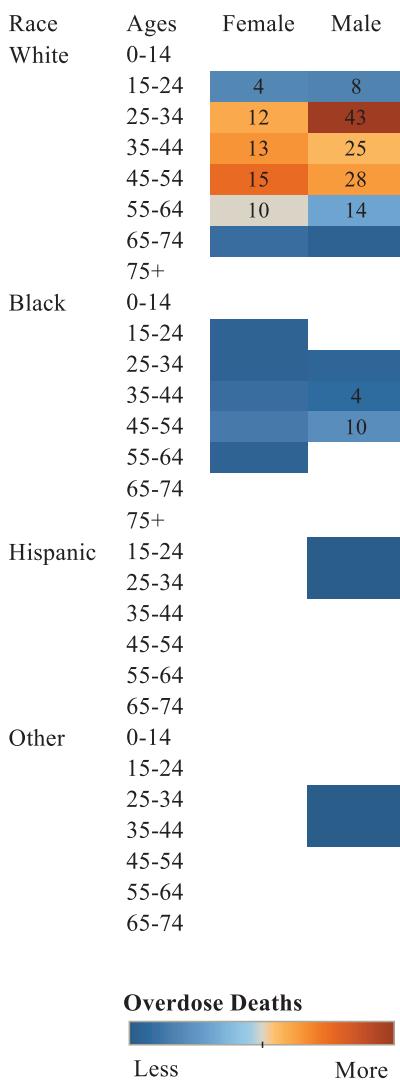
Total Population: 558979



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



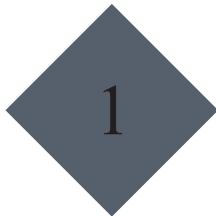
Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	28	22	26	38
Heroin	27	30	31	35
Pres. Opi.	19	23	13	17
Benzos.	19	19	14	21
Ethanol	12	17	17	10
Cocaine	13	19	16	18
Other Illicit	1	1	2	6

Percent Change from 2015 to 2016



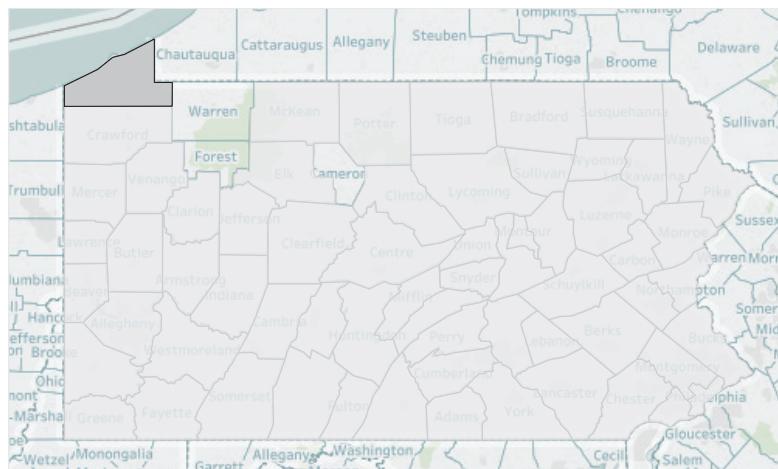
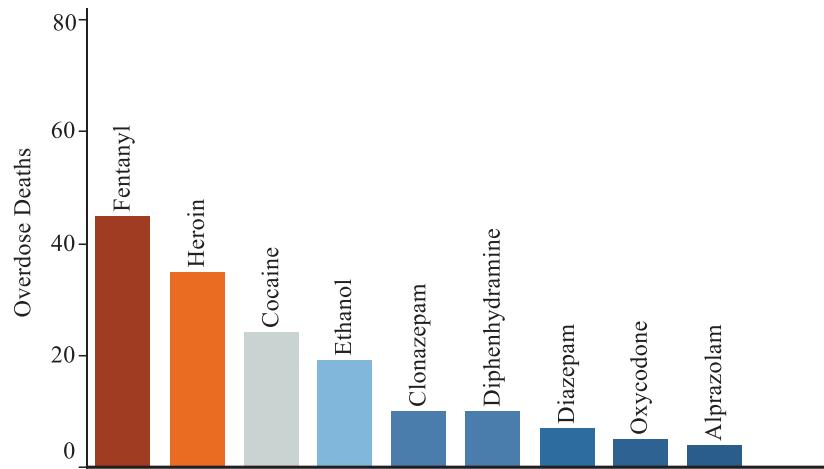
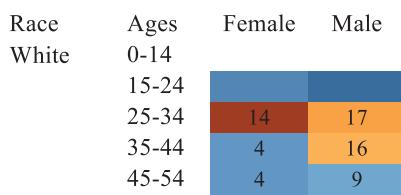
Source: Pennsylvania Coroner/Medical Examiner Data

Appendix

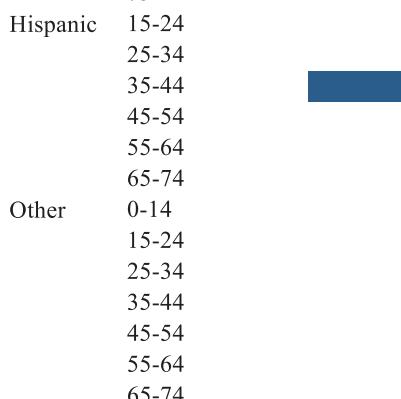
(U) Appendix Figure 32: Analysis of Overdose Death Data within County: Erie

Erie

2016 Overdose Count: 90
2015 Overdose Count: 68
2016 Rank by Rate: 22
2016 Rank by Count: 16
2016 Rate: 32.08
Total Population: 280566

**Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths****Age, Race, and Gender Distribution of Overdose Deaths in 2016****Deaths by Drug Category per Quarter**

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	3	17	6	21
Heroin	6	12	6	11
Pres. Opi.	5	4	5	4
Benzos.	7	7	3	5
Ethanol	2	5	4	8
Cocaine	2	6	3	13
Other Illicit	1	3	2	3

Percent Change from 2015 to 2016

(U) Appendix Figure 33: Analysis of Overdose Death Data within County: Fayette

Fayette

2016 Overdose Count: 60

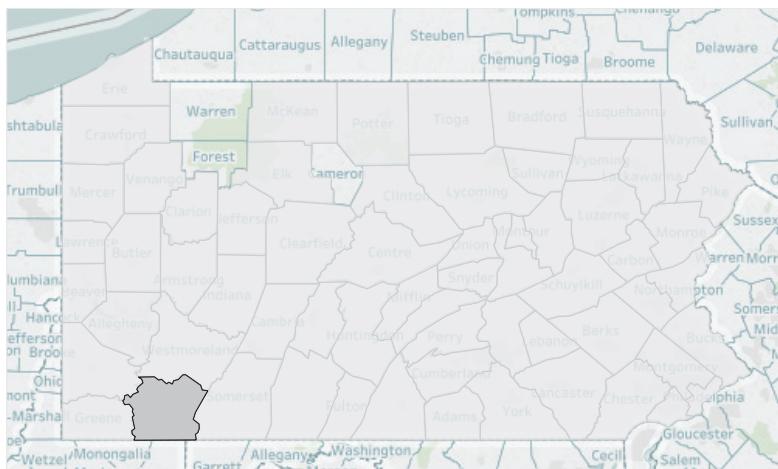
2015 Overdose Count: 41

2016 Rank by Rate: 11

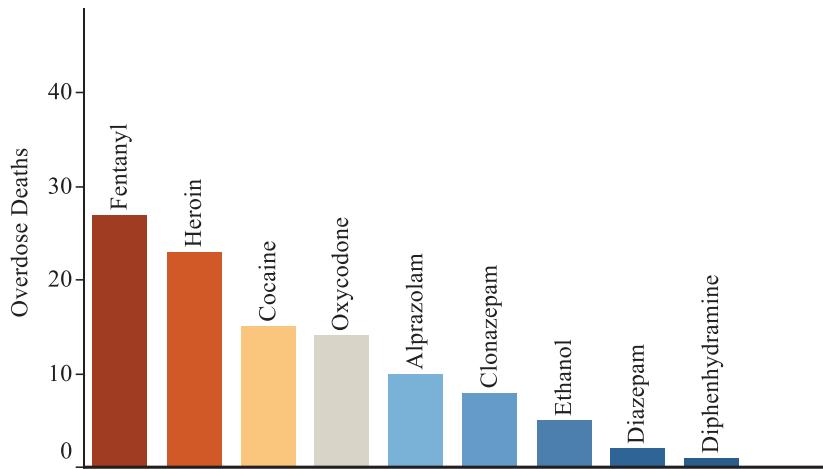
2016 Rank by Count: 20

2016 Rate: 43.92

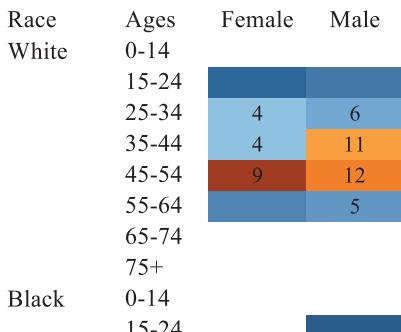
Total Population: 136606



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



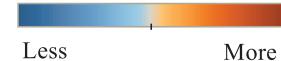
Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	4	2	6	15
Heroin	4	5	5	9
Pres. Opi.	2	1	8	11
Benzos.	2	5	4	9
Ethanol	2	1	1	2
Cocaine	3	3	3	6
Other Illicit				

Percent Change from 2015 to 2016



Overdose Deaths



Less

More

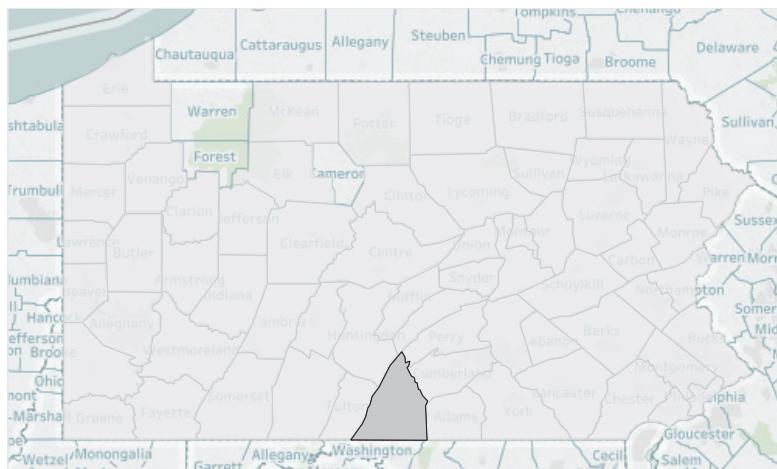
Source: Pennsylvania Coroner/Medical Examiner Data

Appendix

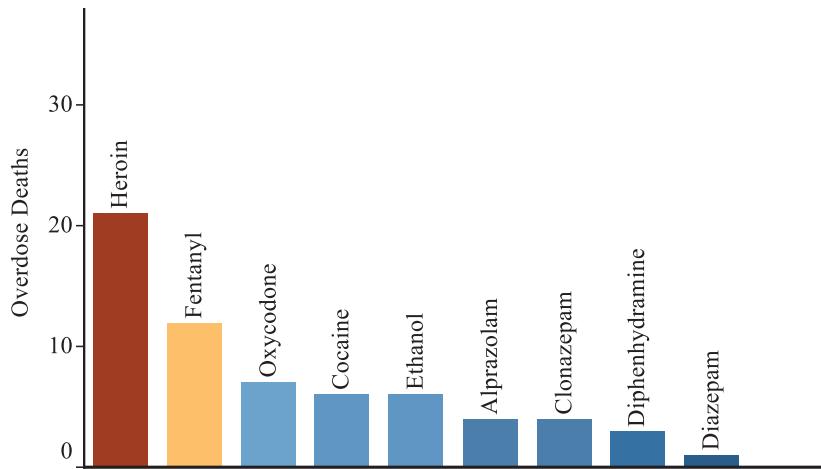
(U) Appendix Figure 34: Analysis of Overdose Death Data within County: Franklin

Franklin

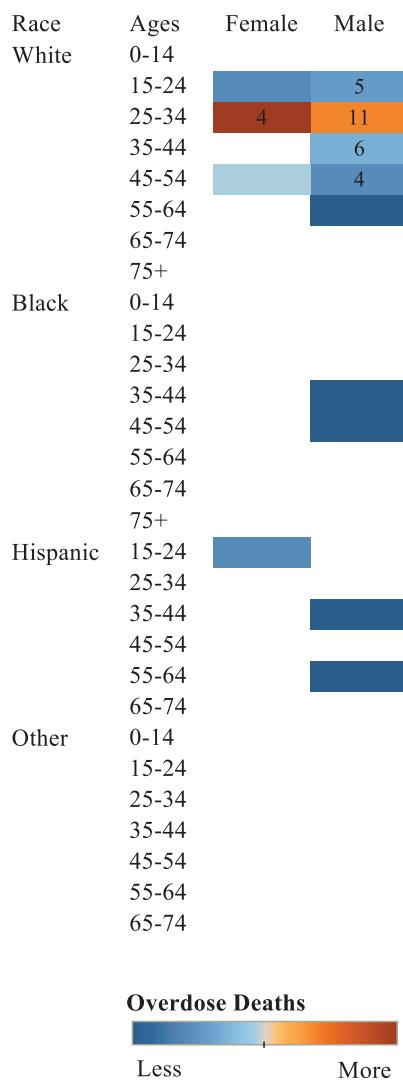
2016 Overdose Count: 39
2015 Overdose Count: 21
2016 Rank by Rate: 36
2016 Rank by Count: 27
2016 Rate: 26.07
Total Population: 149618



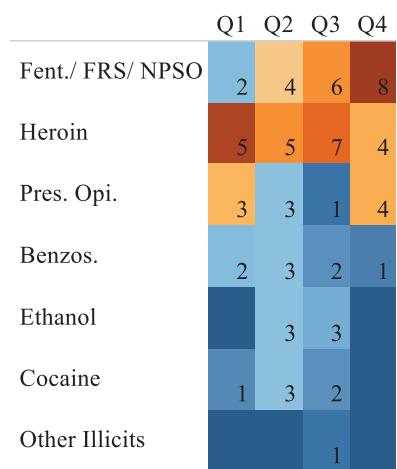
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter



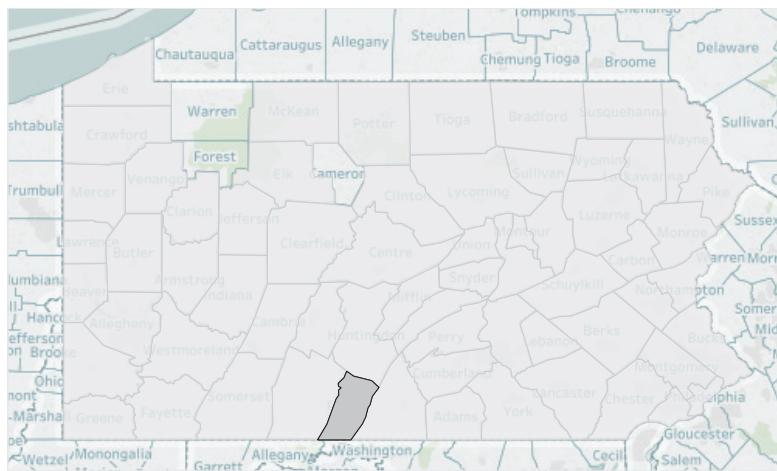
Percent Change from 2015 to 2016



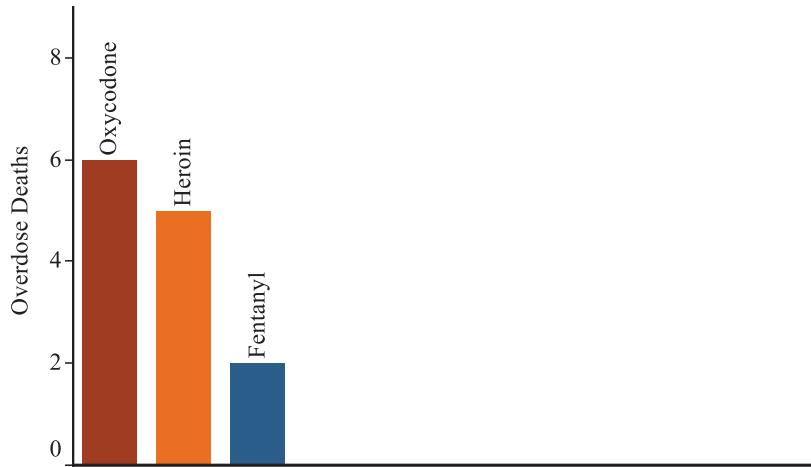
(U) Appendix Figure 35: Analysis of Overdose Death Data within County: Fulton

Fulton

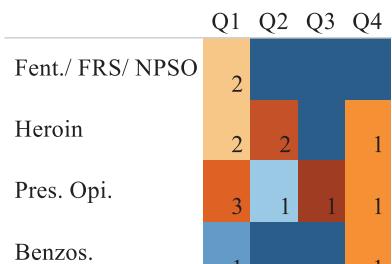
2016 Overdose Count: 11
2015 Overdose Count: 3
2016 Rank by Rate: 1
2016 Rank by Count: 39
2016 Rate: 74.10
Total Population: 14845



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Deaths by Drug Category per Quarter



Ethanol

Cocaine

Other Illicit

Percent Change from 2015 to 2016



Age, Race, and Gender Distribution of Overdose Deaths in 2016

Race	Ages	Female	Male
White	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
Black	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
Hispanic	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
Other	0-14		4
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		



Source: Pennsylvania Coroner/Medical Examiner Data

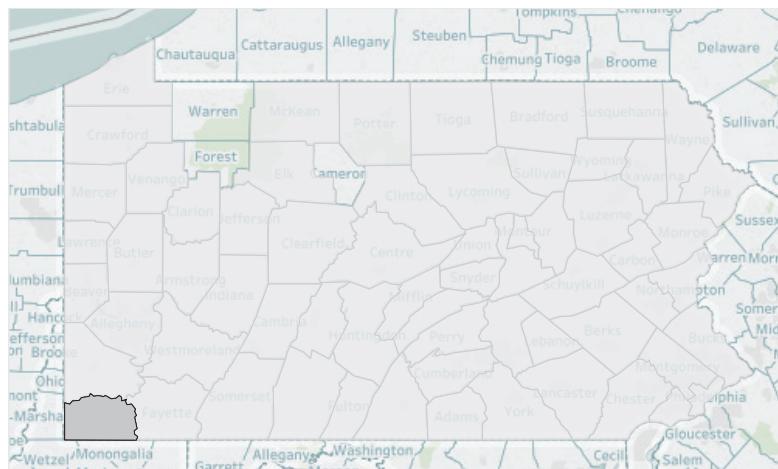
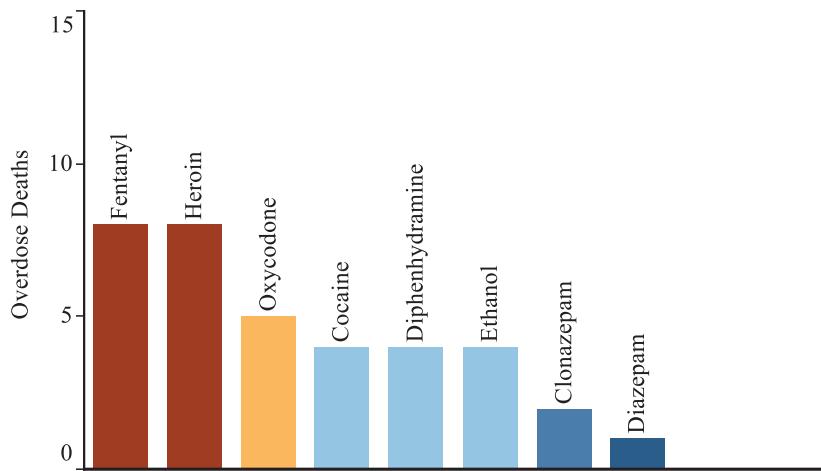
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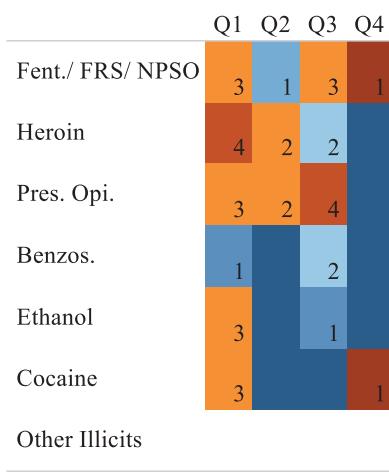
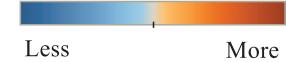
(U) Appendix Figure 36: Analysis of Overdose Death Data within County: Greene

Greene

2016 Overdose Count: 19
2015 Overdose Count: 14
2016 Rank by Rate: 9
2016 Rank by Count: 35
2016 Rate: 49.11
Total Population: 38686

**Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths****Age, Race, and Gender Distribution of Overdose Deaths in 2016**

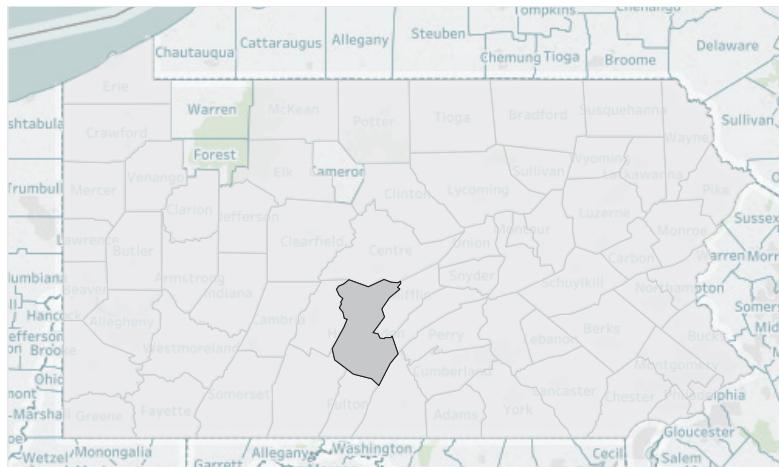
Race	Ages	Female	Male
White	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
Black	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
Hispanic	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
Other	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		

Deaths by Drug Category per Quarter**Percent Change from 2015 to 2016****Overdose Deaths**

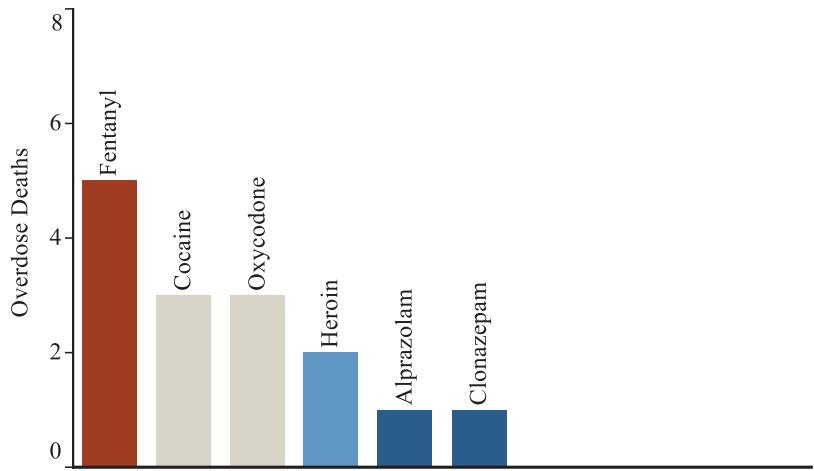
(U) Appendix Figure 37: Analysis of Overdose Death Data within County: Huntingdon

Huntingdon

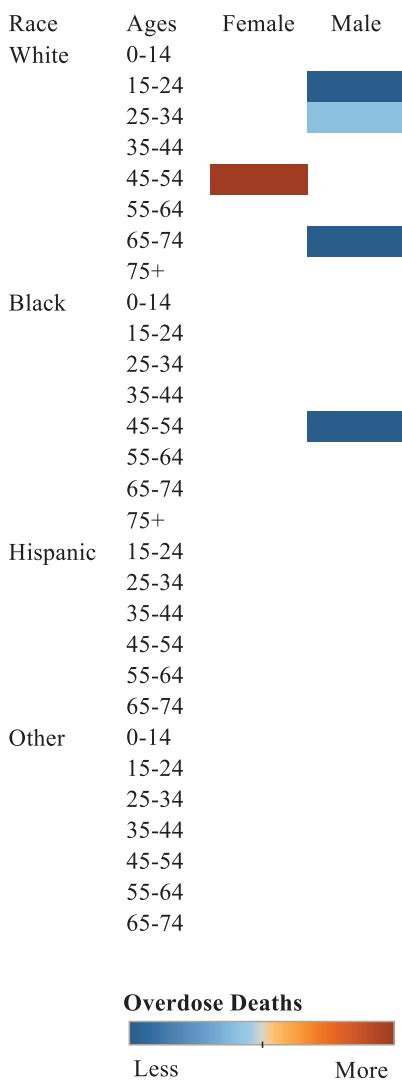
2016 Overdose Count: 7
2015 Overdose Count: 8
2016 Rank by Rate: 56
2016 Rank by Count: 43
2016 Rate: 15.25
Total Population: 45913



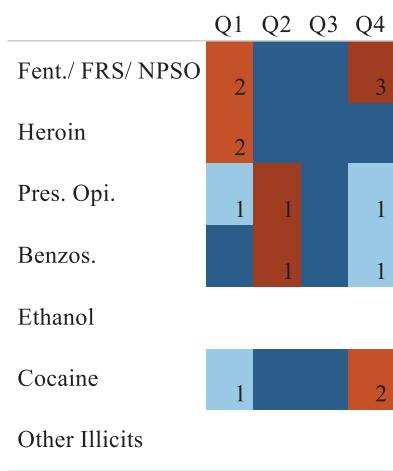
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter



Percent Change from 2015 to 2016

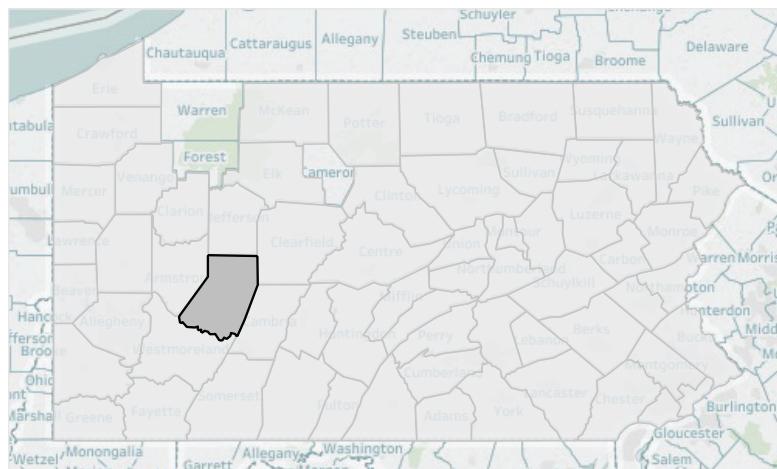


Appendix

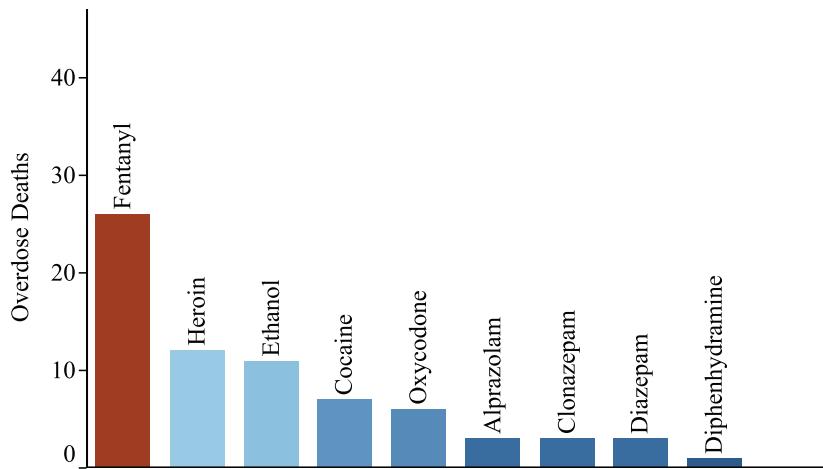
(U) Appendix Figure 38: Analysis of Overdose Death Data within County: Indiana

Indiana

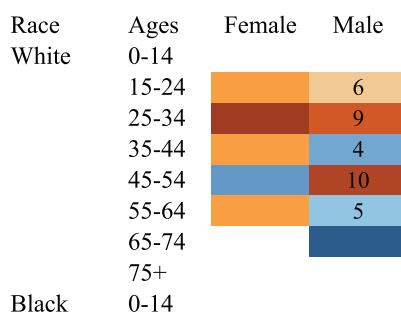
2016 Overdose Count: 45
2015 Overdose Count: 35
2016 Rank by Rate: 8
2016 Rank by Count: 23
2016 Rate: 50.63
Total Population: 88880



Top 10 Drugs Present in 2016 Accidental Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



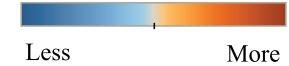
Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRC	3	4	6	13
Heroin	5	3	3	1
Pres. Opi.	2	2	4	5
Benzos.	2	3	1	5
Ethanol	1	6	2	2
Cocaine	1	4		2
Other Illicit		1		1

Percent Change from 2015 to 2016



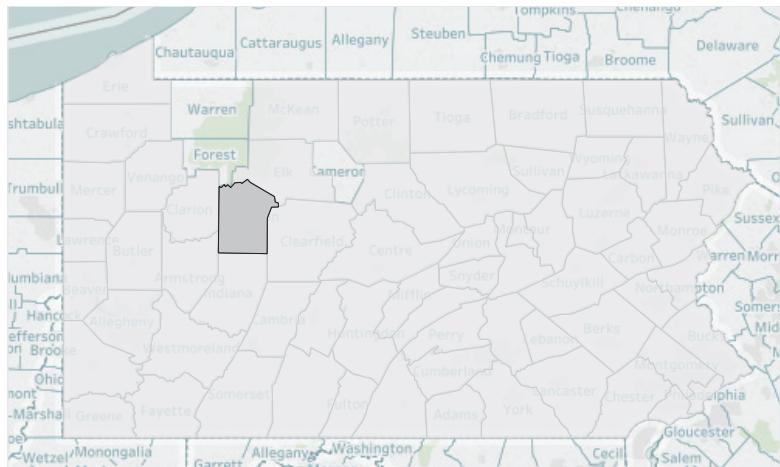
Overdose Deaths



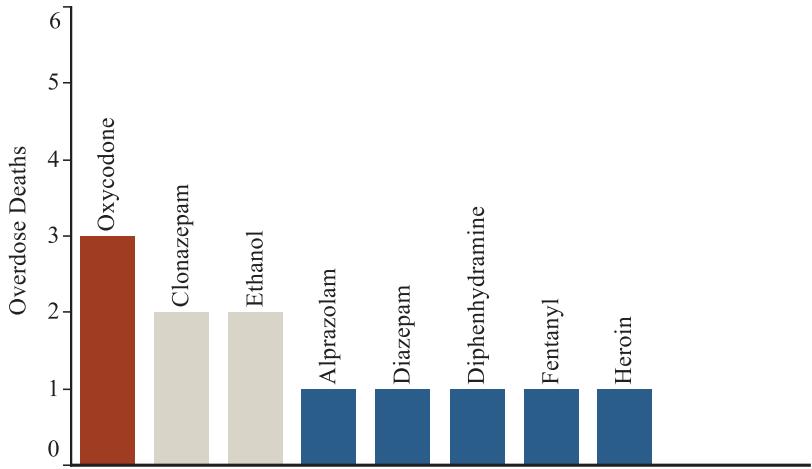
(U) Appendix Figure 39: Analysis of Overdose Death Data within County: Jefferson

Jefferson

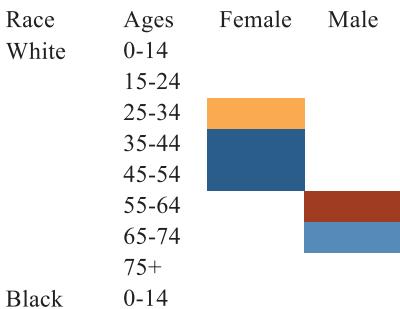
2016 Overdose Count: 7
2015 Overdose Count: 8
2016 Rank by Rate: 55
2016 Rank by Count: 43
2016 Rate: 15.49
Total Population: 45200



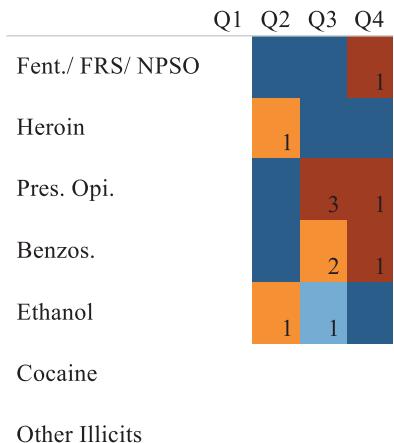
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter



Percent Change from 2015 to 2016



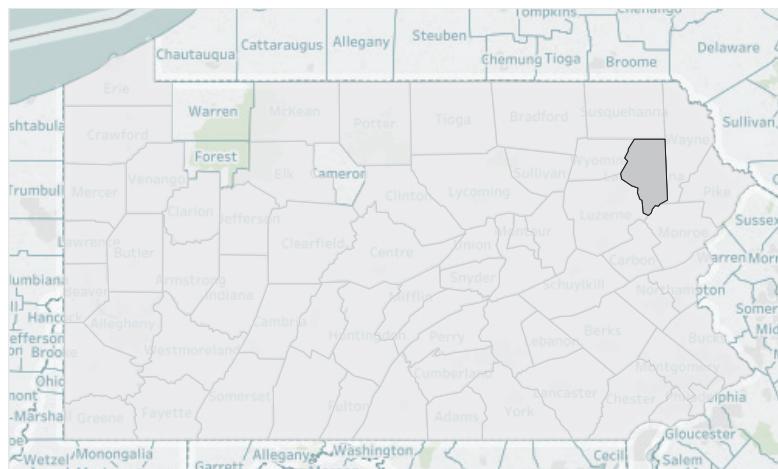
Source: Pennsylvania Coroner/Medical Examiner Data

Appendix

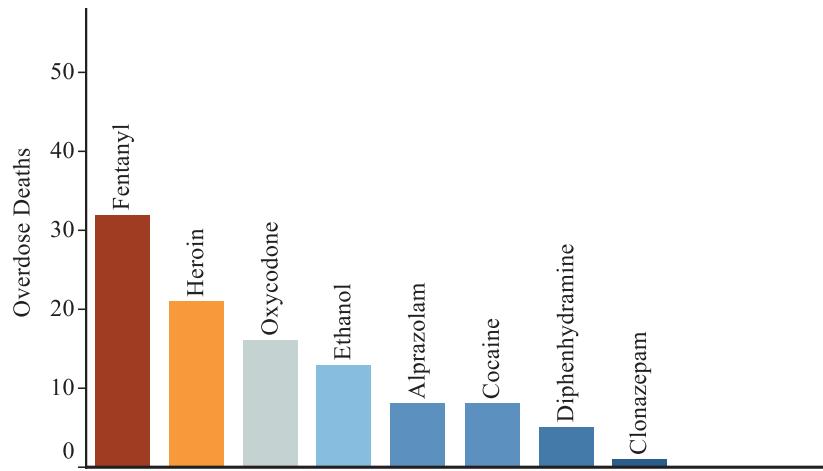
(U) Appendix Figure 40: Analysis of Overdose Death Data within County: Lackawanna

Lackawanna

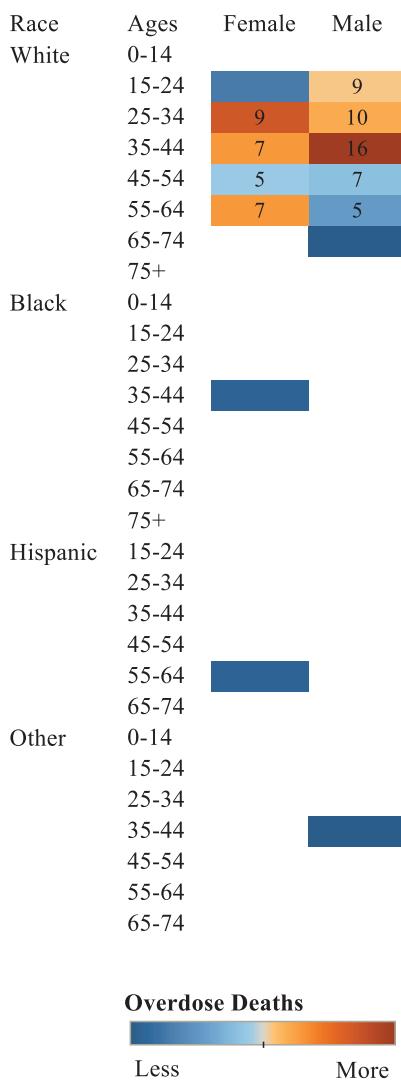
2016 Overdose Count: 84
2015 Overdose Count: 70
2016 Rank by Rate: 16
2016 Rank by Count: 17
2016 Rate: 39.17
Total Population: 214437



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	6	5	11	11
Heroin	3	3	6	9
Pres. Opi.	13	2	12	8
Benzos.	7	1	10	7
Ethanol	3	2	3	5
Cocaine	3	2	1	2
Other Illicit			1	

Percent Change from 2015 to 2016



(U) Appendix Figure 41: Analysis of Overdose Death Data within County: Lancaster

Lancaster

2016 Overdose Count: 116

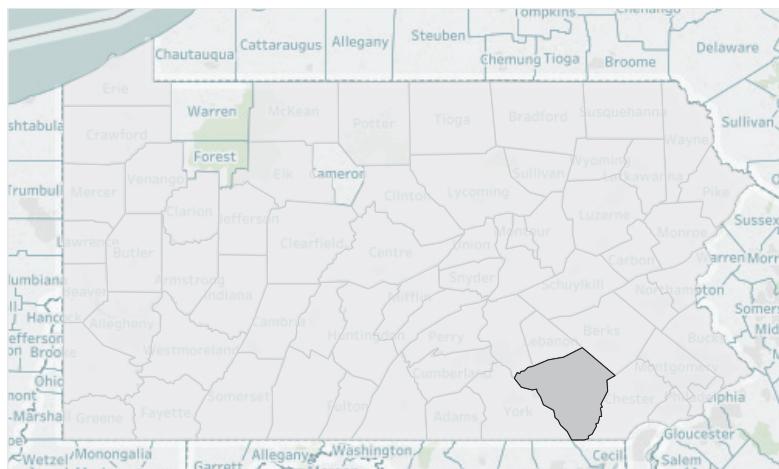
2015 Overdose Count: 80

2016 Rank by Rate: 43

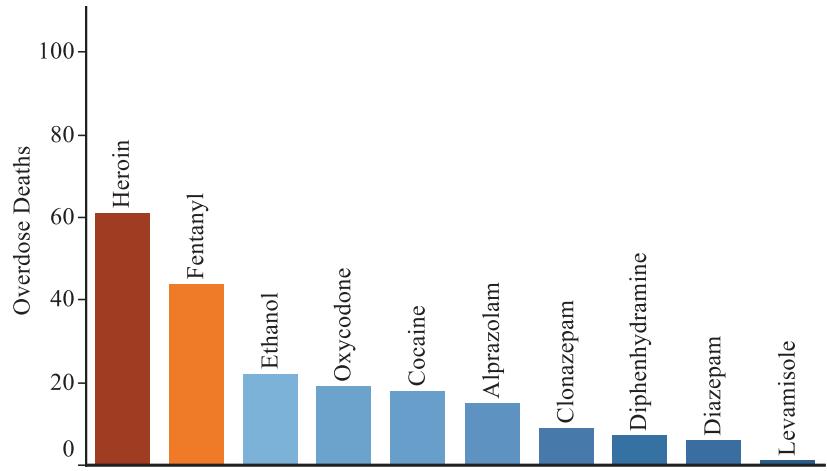
2016 Rank by Count: 11

2016 Rate: 22.33

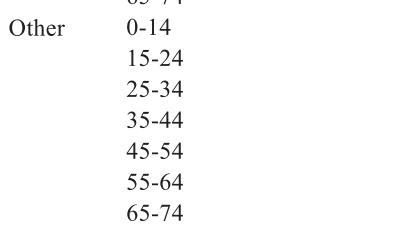
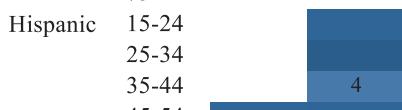
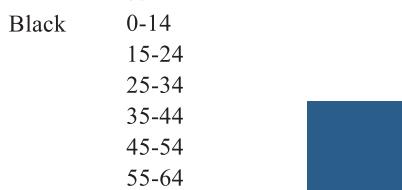
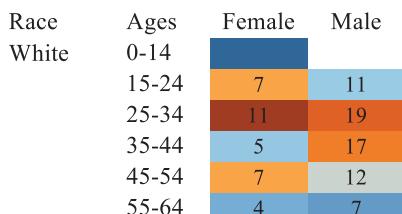
Total Population: 519445



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	5	10	12	19
Heroin	7	11	24	19
Pres. Opi.	8	6	12	8
Benzos.	8	6	9	10
Ethanol	1	6	11	4
Cocaine	4	1	7	6
Other Illicit	1	3	4	2

Percent Change from 2015 to 2016



Source: Pennsylvania Coroner/Medical Examiner Data

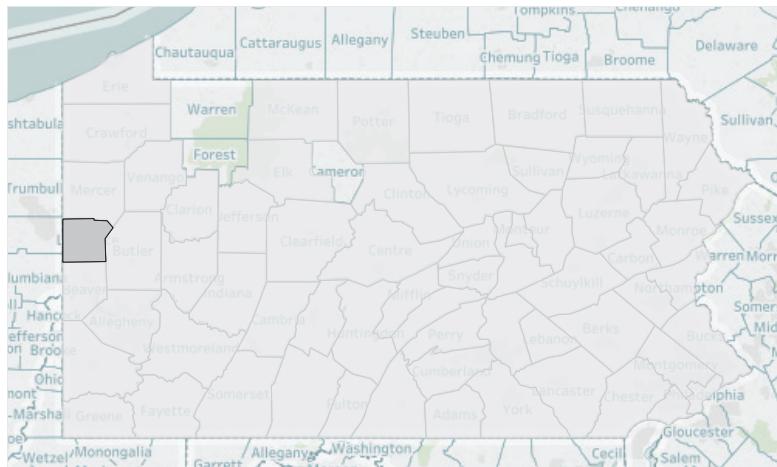
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Appendix

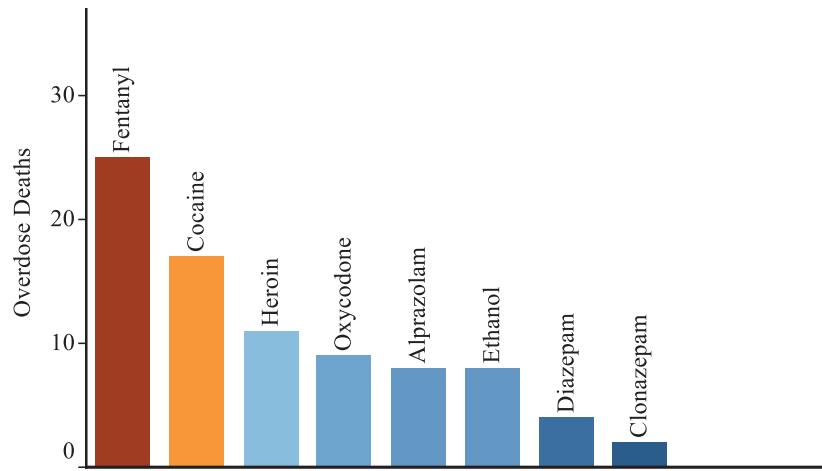
(U) Appendix Figure 42: Analysis of Overdose Death Data within County: Lawrence

Lawrence

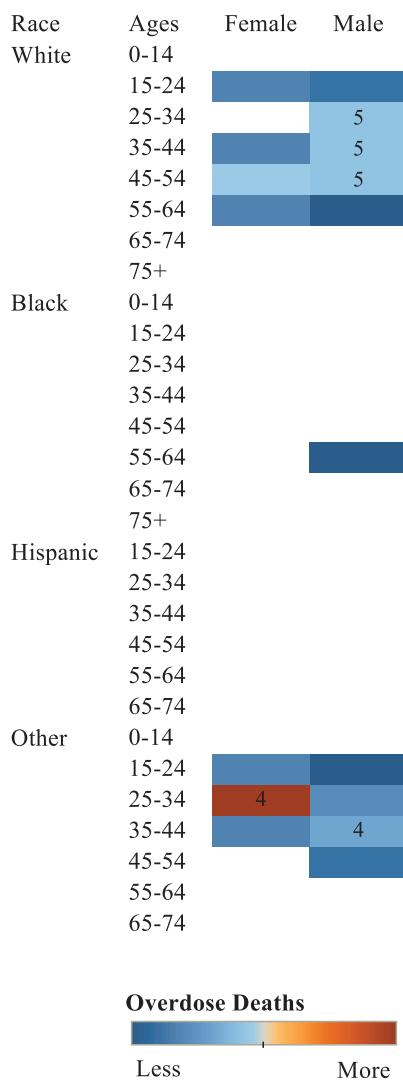
2016 Overdose Count: 40
2015 Overdose Count: 30
2016 Rank by Rate: 12
2016 Rank by Count: 26
2016 Rate: 43.90
Total Population: 91108



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	5	5	5	15
Heroin	6	1	3	1
Pres. Opi.	6	3	5	4
Benzos.	6	1	4	5
Ethanol	3	1	1	3
Cocaine	5	2	3	7
Other Illicit				

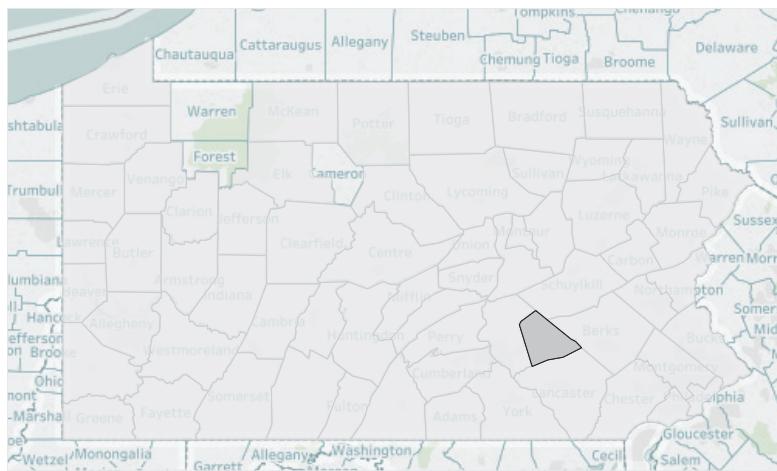
Percent Change from 2015 to 2016



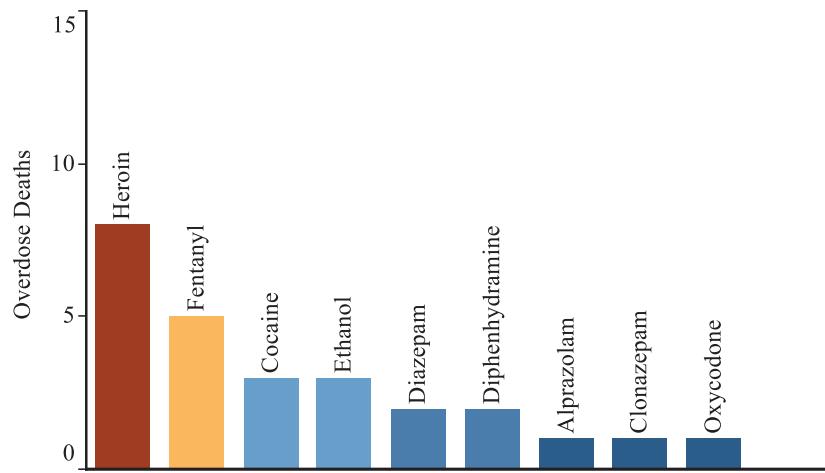
(U) Appendix Figure 43: Analysis of Overdose Death Data within County: Lebanon

Lebanon

2016 Overdose Count: 16
2015 Overdose Count: 20
2016 Rank by Rate: 61
2016 Rank by Count: 38
2016 Rate: 11.98
Total Population: 133568



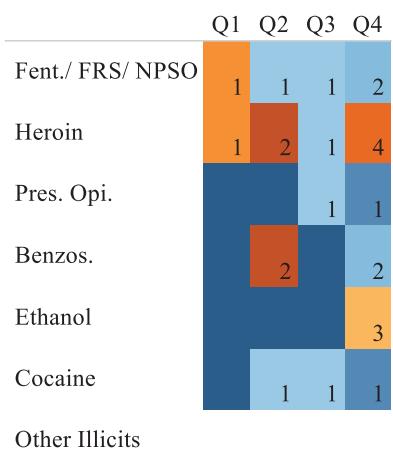
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016

Race	Ages	Female	Male
White	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
Black	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
Hispanic	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
Other	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		

Deaths by Drug Category per Quarter



Percent Change from 2015 to 2016



Source: Pennsylvania Coroner/Medical Examiner Data

Appendix

(U) Appendix Figure 44: Analysis of Overdose Death Data within County: Lehigh

Lehigh

2016 Overdose Count: 134

2015 Overdose Count: 115

2016 Rank by Rate: 17

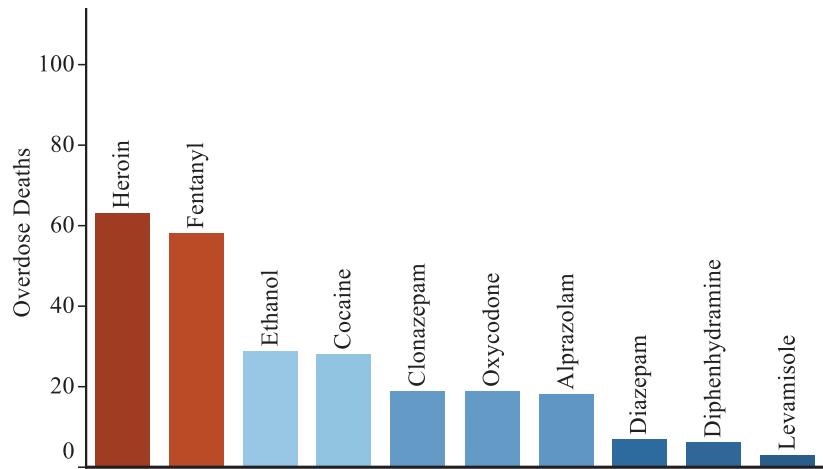
2016 Rank by Count: 8

2016 Rate: 38.34

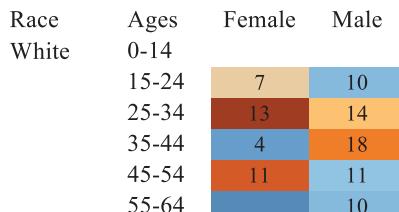
Total Population: 349497



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



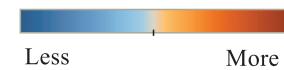
Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	26	13	7	15
Heroin	17	12	15	19
Pres. Opi.	5	6	8	10
Benzos.	10	11	12	12
Ethanol	6	3	11	9
Cocaine	9	9	5	5
Other Illicit	4	4	4	5

Percent Change from 2015 to 2016



Overdose Deaths



(U) Appendix Figure 45: Analysis of Overdose Death Data within County: Luzerne

Luzerne

2016 Overdose Count: 140

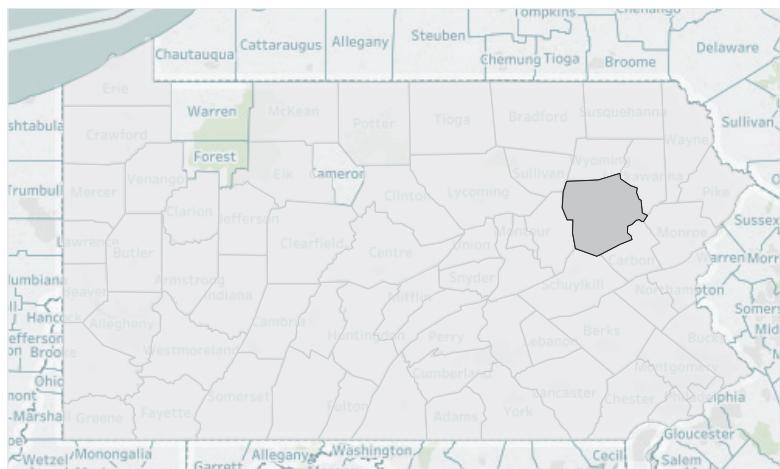
2015 Overdose Count: 95

2016 Rank by Rate: 13

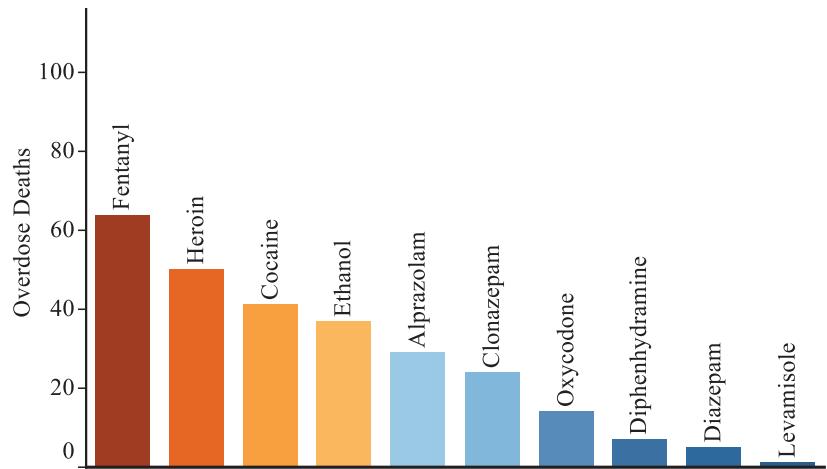
2016 Rank by Count: 7

2016 Rate: 43.62

Total Population: 320918



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016

Race	Ages	Female	Male
White	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
	0-14		
	15-24		
Black	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
	0-14		
	15-24		
	25-34		
	35-44		
Hispanic	45-54		
	55-64		
	65-74		
	75+		
	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
Other	65-74		
	75+		
	0-14		
	15-24	7	6
	25-34	11	43
	35-44	8	22
	45-54	7	17
	55-64	6	9
	65-74		

Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	16	15	16	20
Heroin	9	13	13	15
Pres. Opi.	11	9	11	6
Benzos.	13	17	8	12
Ethanol	9	12	7	9
Cocaine	11	12	11	7
Other Illicit	2	1	3	3

Percent Change from 2015 to 2016



Source: Pennsylvania Coroner/Medical Examiner Data

UNCLASSIFIED

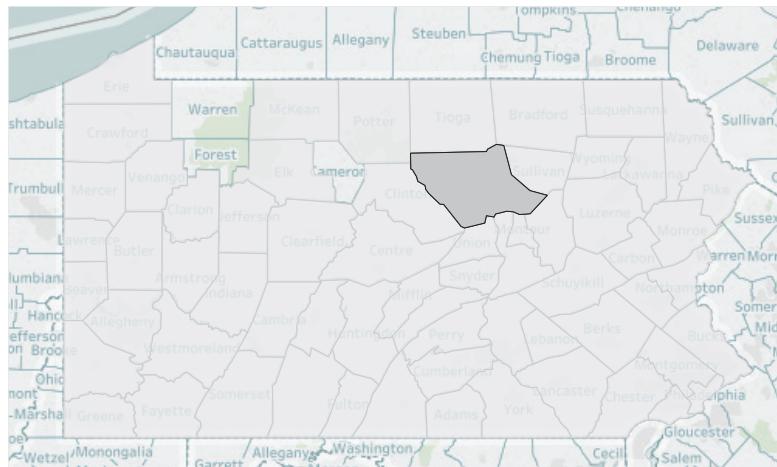
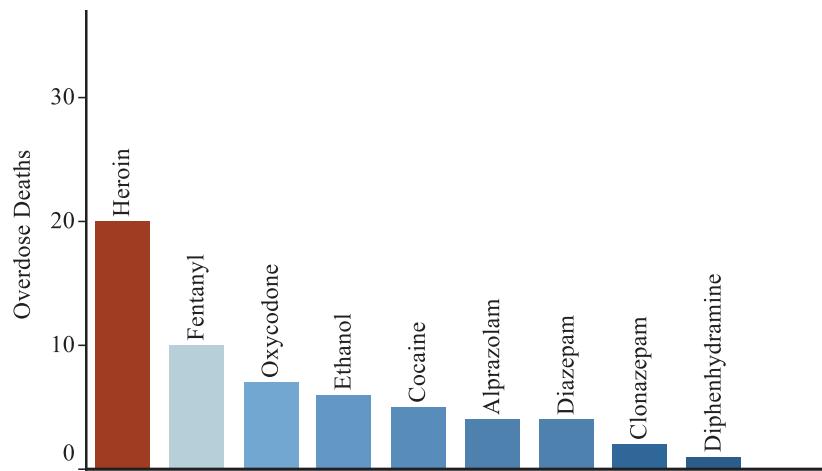
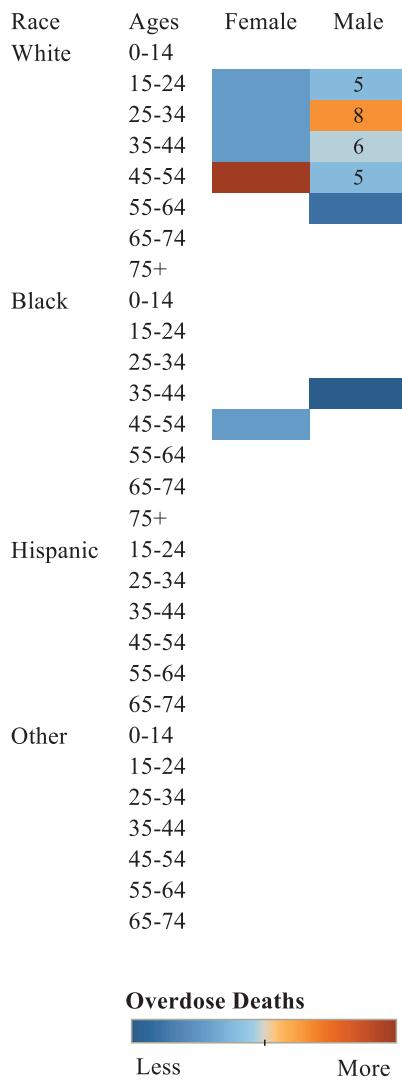


Appendix

(U) Appendix Figure 46: Analysis of Overdose Death Data within County: Lycoming

Lycoming

2016 Overdose Count: 34
2015 Overdose Count: 25
2016 Rank by Rate: 24
2016 Rank by Count: 28
2016 Rate: 29.28
Total Population: 116111

**Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths****Age, Race, and Gender Distribution of Overdose Deaths in 2016****Deaths by Drug Category per Quarter**

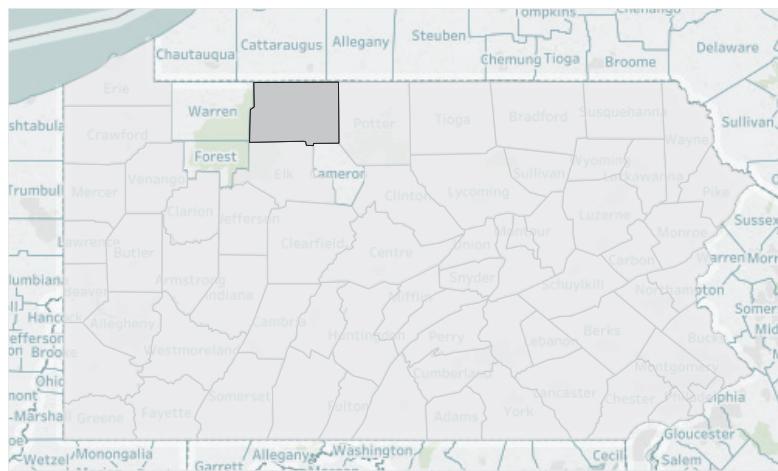
	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	2	6	3	3
Heroin	4	6	7	3
Pres. Opi.	3	2	2	4
Benzos.	2	4	4	2
Ethanol	1	1	4	2
Cocaine	1		2	2
Other Illicit		1	1	

Percent Change from 2015 to 2016

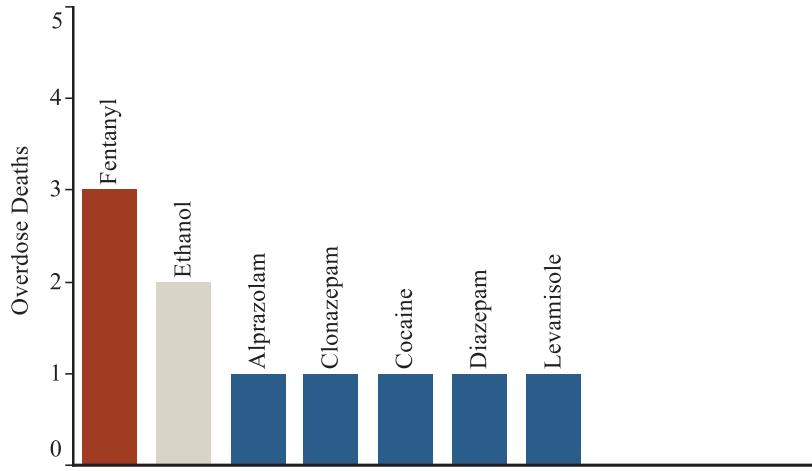
(U) Appendix Figure 47: Analysis of Overdose Death Data within County: McKean

McKean

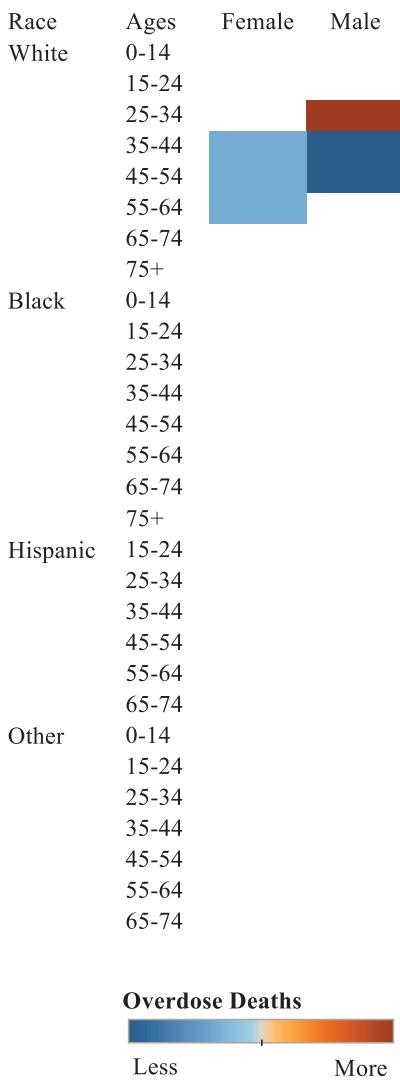
2016 Overdose Count: 7
2015 Overdose Count: 8
2016 Rank by Rate: 52
2016 Rank by Count: 43
2016 Rate: 16.11
Total Population: 43450



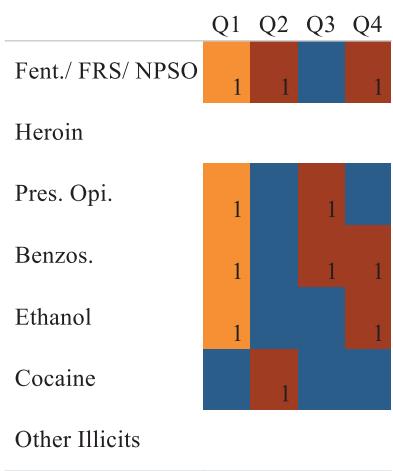
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter



Percent Change from 2015 to 2016

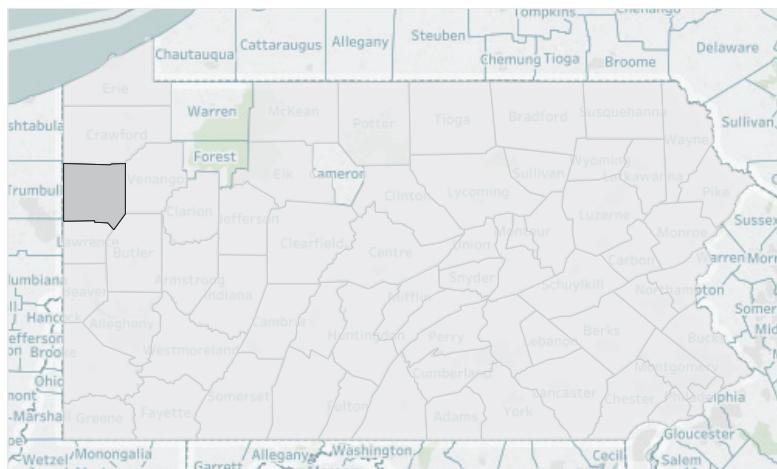


Appendix

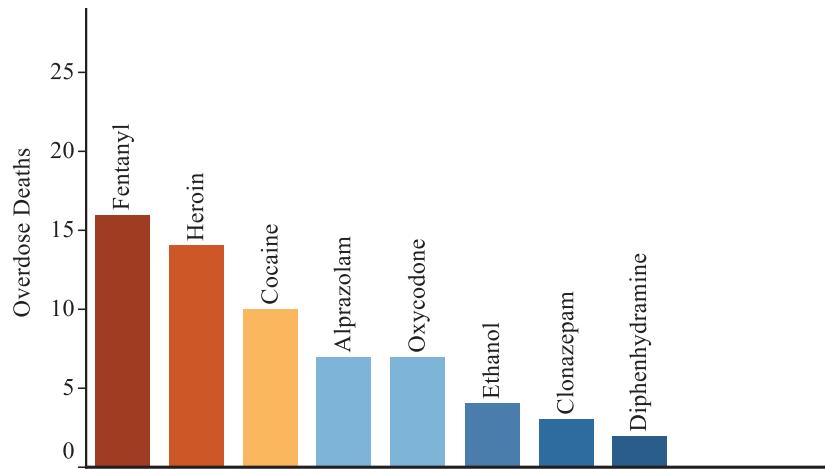
(U) Appendix Figure 48: Analysis of Overdose Death Data within County: Mercer

Mercer

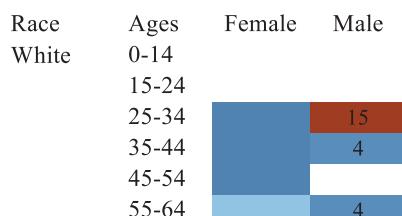
2016 Overdose Count: 31
2015 Overdose Count: 18
2016 Rank by Rate: 35
2016 Rank by Count: 30
2016 Rate: 26.58
Total Population: 116638



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



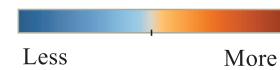
Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	2	1	8	5
Heroin	1	2	5	6
Pres. Opi.	3	3	4	2
Benzos.	1	4	3	3
Ethanol	1	1	2	1
Cocaine	1	1	3	5
Other Illicit				

Percent Change from 2015 to 2016



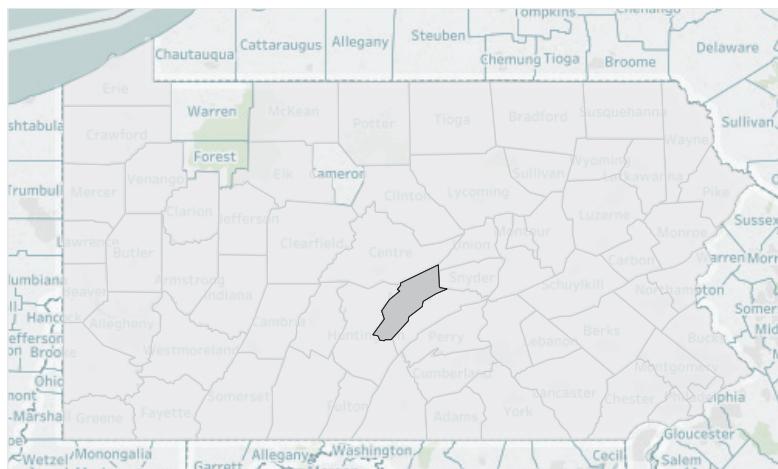
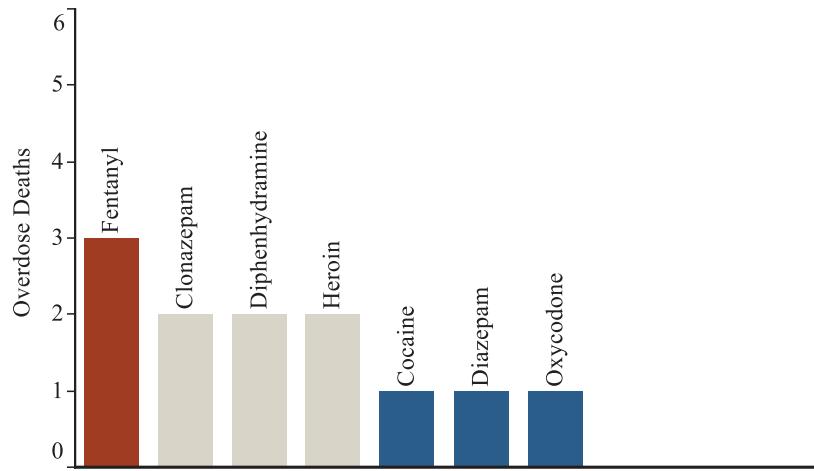
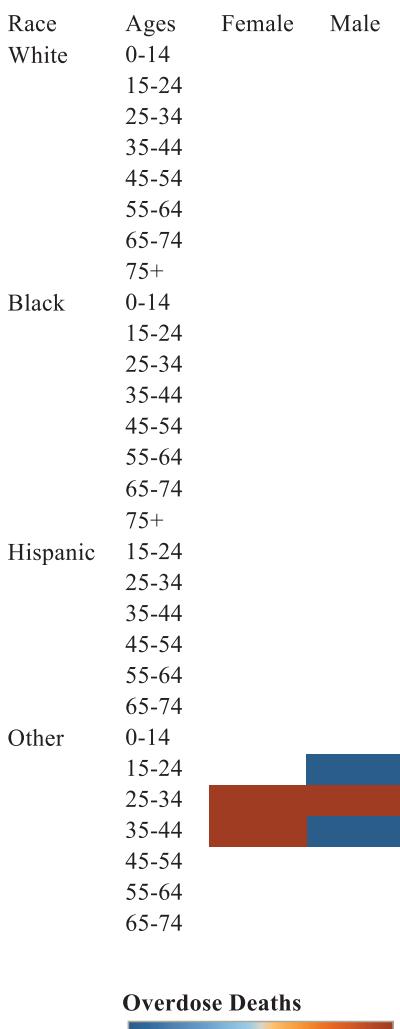
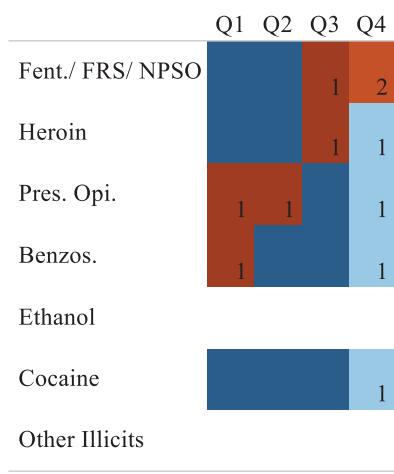
Overdose Deaths



(U) Appendix Figure 49: Analysis of Overdose Death Data within County: Mifflin

Mifflin

2016 Overdose Count: 6
2015 Overdose Count: 5
2016 Rank by Rate: 60
2016 Rank by Count: 44
2016 Rate: 12.85
Total Population: 46682

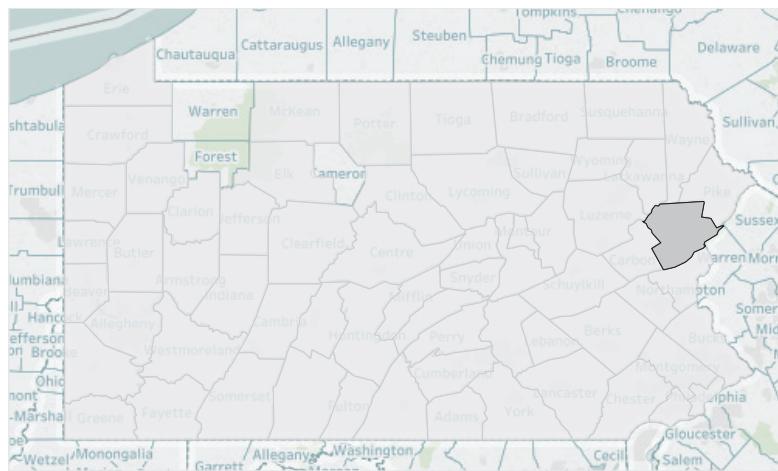
**Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths****Age, Race, and Gender Distribution of Overdose Deaths in 2016****Deaths by Drug Category per Quarter****Percent Change from 2015 to 2016**

Appendix

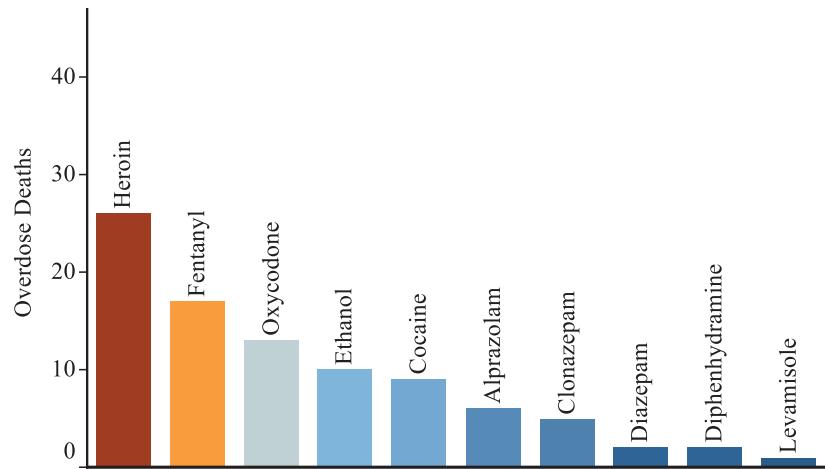
(U) Appendix Figure 50: Analysis of Overdose Death Data within County: Monroe

Monroe

2016 Overdose Count: 41
2015 Overdose Count: 41
2016 Rank by Rate: 41
2016 Rank by Count: 25
2016 Rate: 24.14
Total Population: 169842



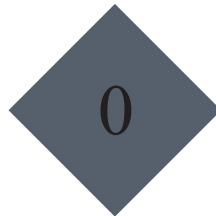
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



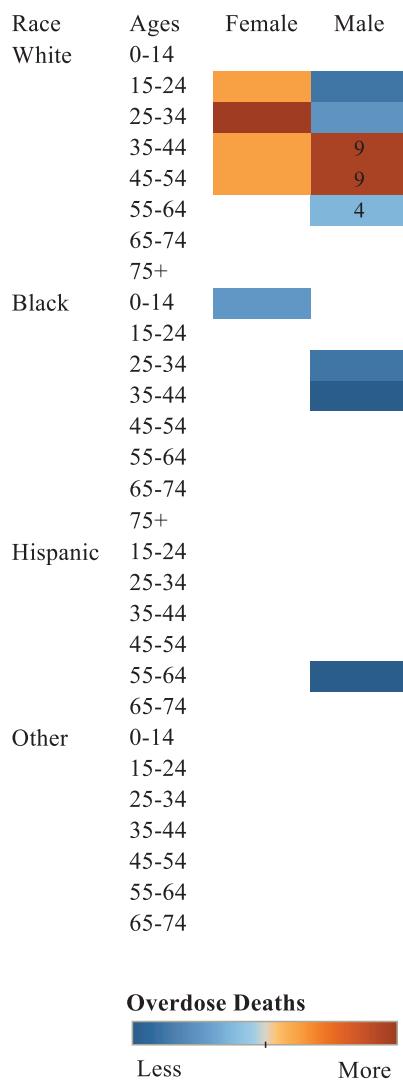
Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	5	2	3	7
Heroin	8	4	7	7
Pres. Opi.	4	4	6	3
Benzos.	6	1	4	1
Ethanol	3	3	2	2
Cocaine	2	2	3	2
Other Illicit			2	2

Percent Change from 2015 to 2016



Age, Race, and Gender Distribution of Overdose Deaths in 2016



(U) Appendix Figure 51: Analysis of Overdose Death Data within County: Montgomery

Montgomery

2016 Overdose Count: 230

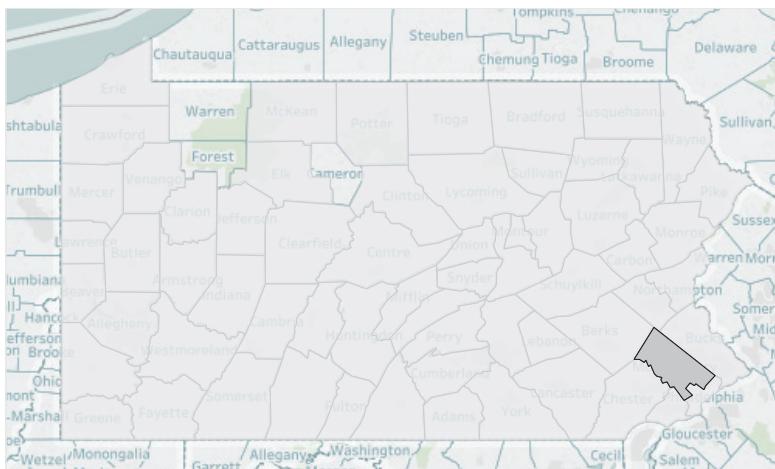
2015 Overdose Count: 152

2016 Rank by Rate: 26

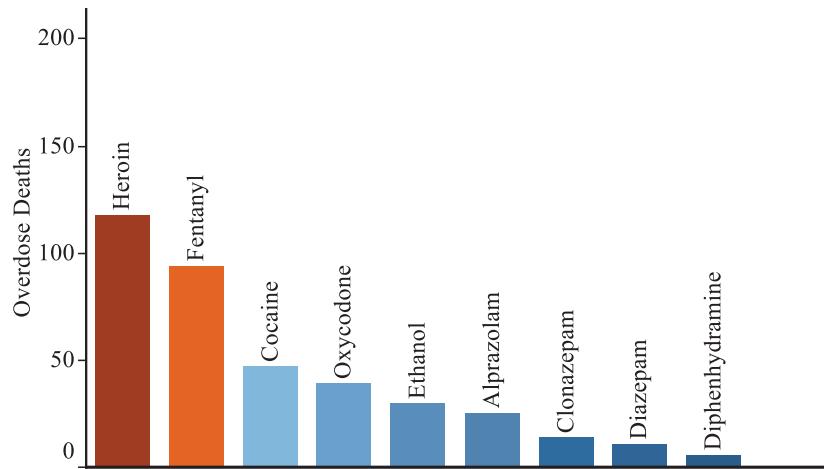
2016 Rank by Count: 3

2016 Rate: 28.75

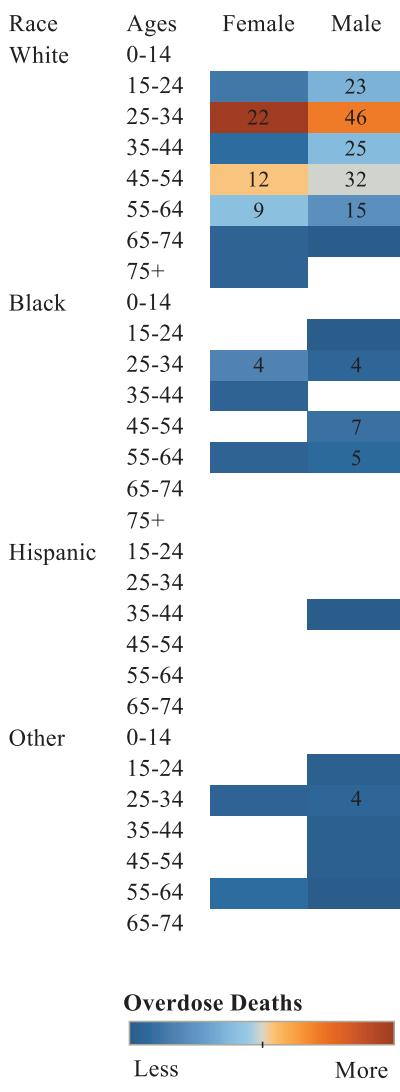
Total Population: 799874



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	29	14	27	36
Heroin	33	37	24	24
Pres. Opi.	11	17	14	11
Benzos.	8	14	16	10
Ethanol	7	7	9	7
Cocaine	13	11	13	10
Other Illicit	2	3	2	2

Percent Change from 2015 to 2016



Source: Pennsylvania Coroner/Medical Examiner Data

UNCLASSIFIED

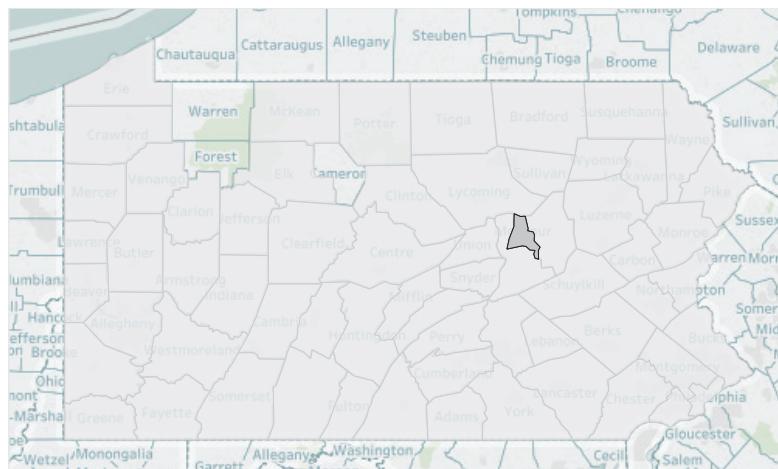
The death count for 2015 has been updated from 136 to 152.

Appendix

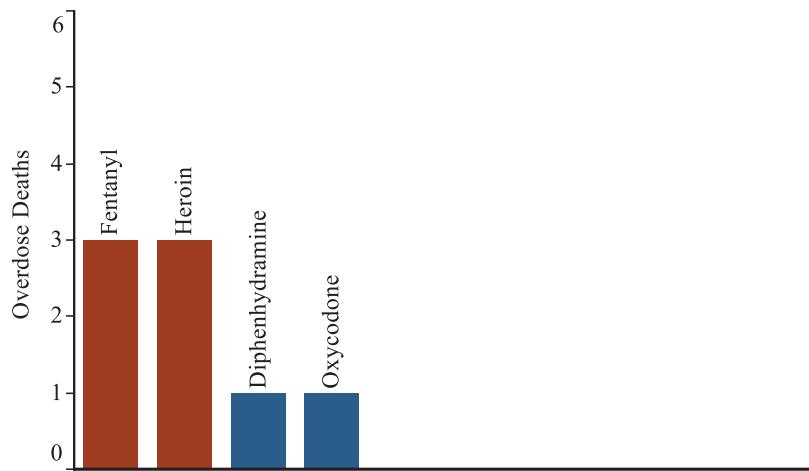
(U) Appendix Figure 52: Analysis of Overdose Death Data within County: Montour

Montour

2016 Overdose Count: 5
2015 Overdose Count: 8
2016 Rank by Rate: 30
2016 Rank by Count: 45
2016 Rate: 27.37
Total Population: 18267



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



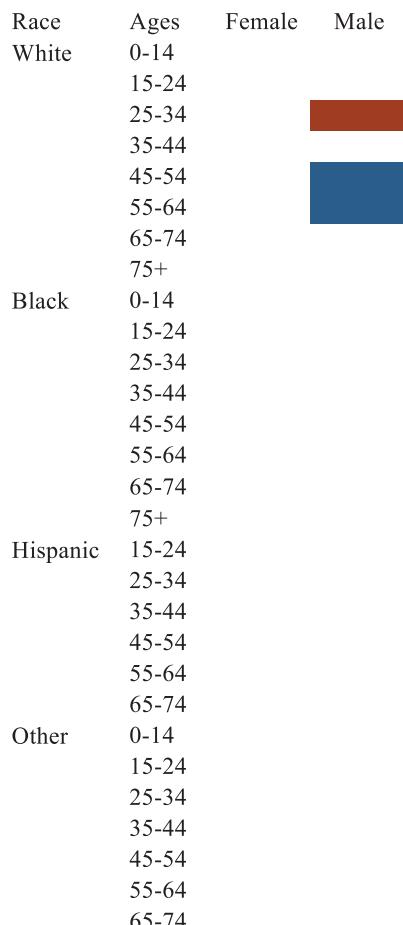
Deaths by Drug Category per Quarter



Percent Change from 2015 to 2016



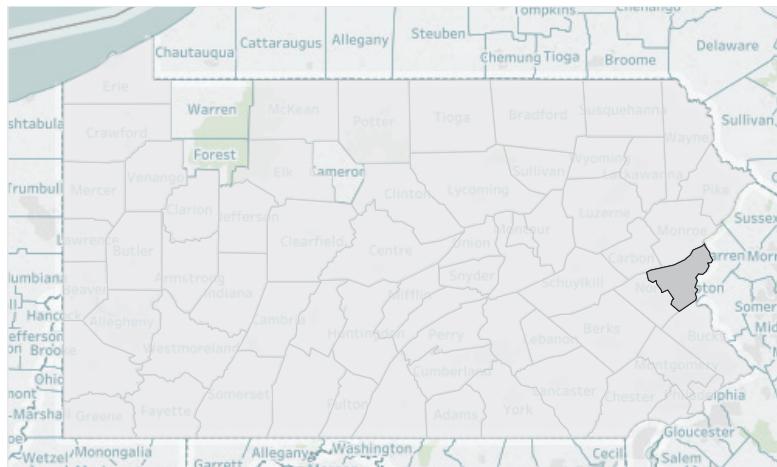
Age, Race, and Gender Distribution of Overdose Deaths in 2016



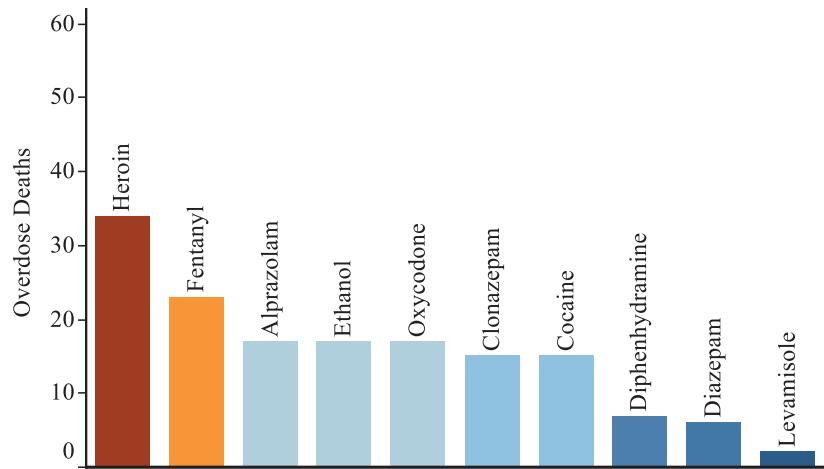
(U) Appendix Figure 53: Analysis of Overdose Death Data within County: Northampton

Northampton

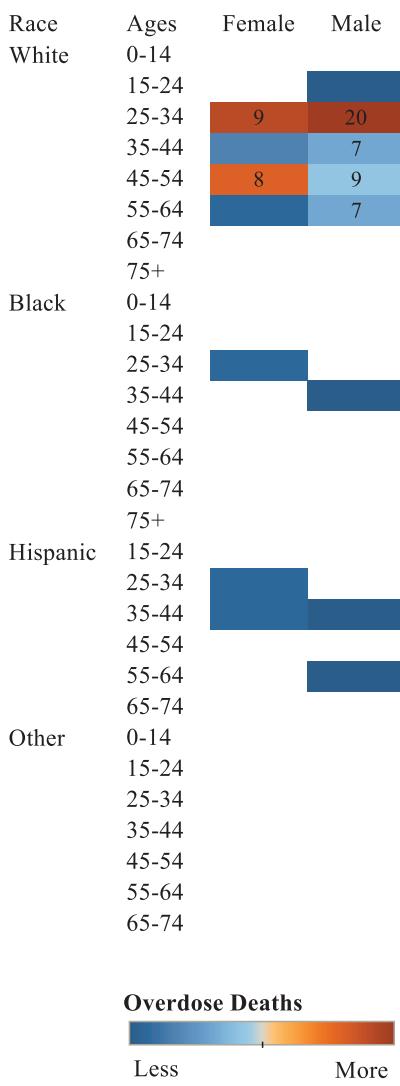
2016 Overdose Count: 70
2015 Overdose Count: 71
2016 Rank by Rate: 42
2016 Rank by Count: 19
2016 Rate: 23.51
Total Population: 297735



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



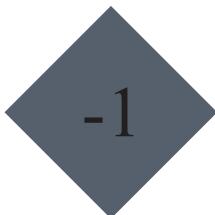
Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	12	4	7	5
Heroin	13	6	9	6
Pres. Opi.	11	4	5	6
Benzos.	14	4	8	7
Ethanol	6	3	6	2
Cocaine	4	1	6	4
Other Illicit	5	1	3	3

Percent Change from 2015 to 2016



Source: Pennsylvania Coroner/Medical Examiner Data

Appendix

(U) Appendix Figure 54: Analysis of Overdose Death Data within County: Northumberland

Northumberland

2016 Overdose Count: 27

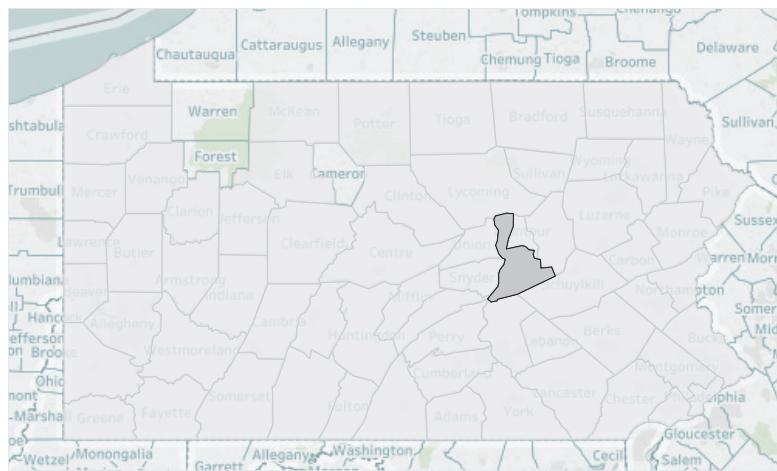
2015 Overdose Count: 16

2016 Rank by Rate: 27

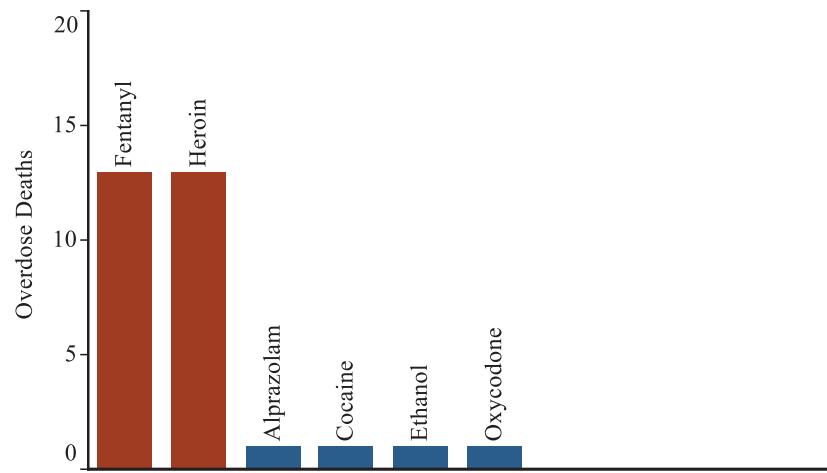
2016 Rank by Count: 32

2016 Rate: 28.56

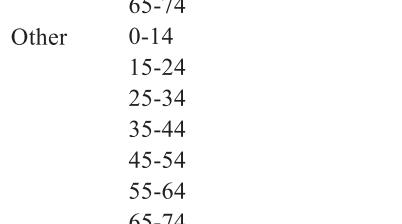
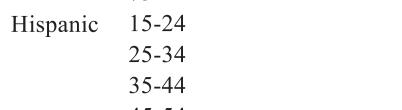
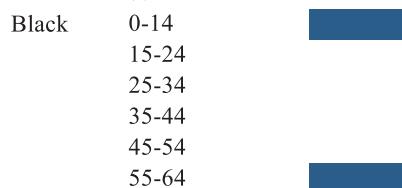
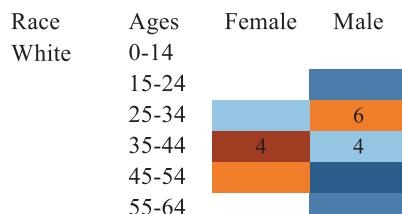
Total Population: 94528



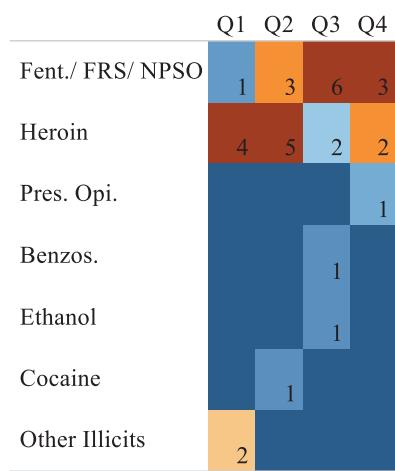
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter



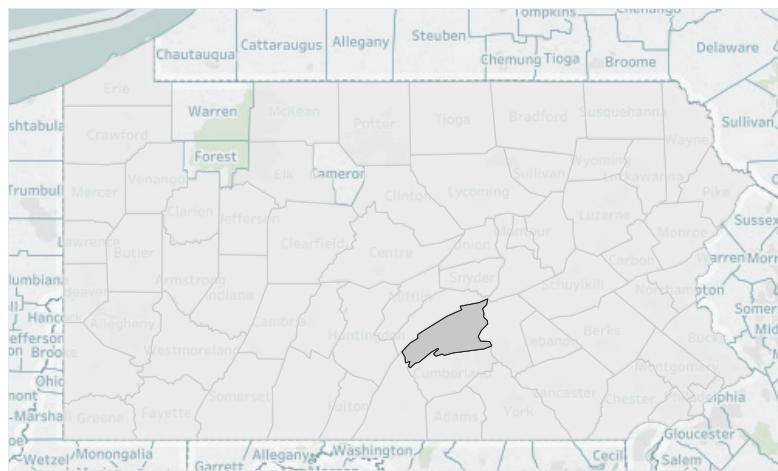
Percent Change from 2015 to 2016



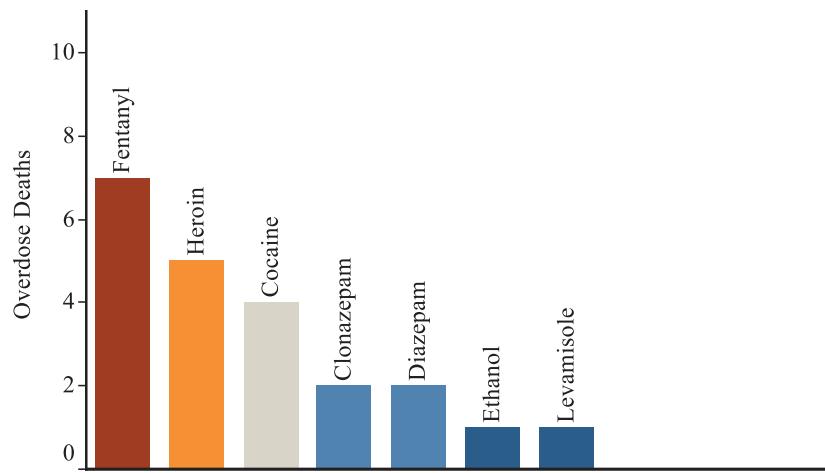
(U) Appendix Figure 55: Analysis of Overdose Death Data within County: Perry

Perry

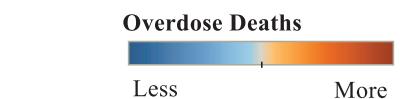
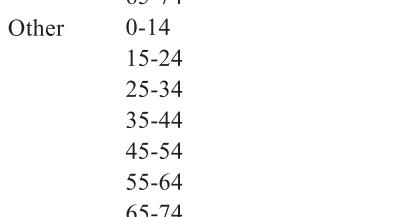
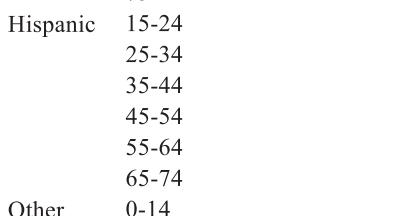
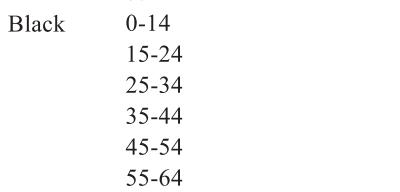
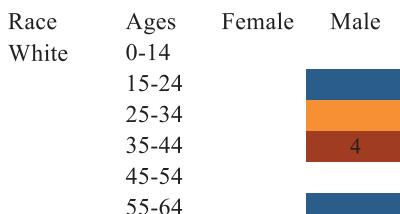
2016 Overdose Count: 9
2015 Overdose Count: 3
2016 Rank by Rate: 45
2016 Rank by Count: 41
2016 Rate: 19.58
Total Population: 45969



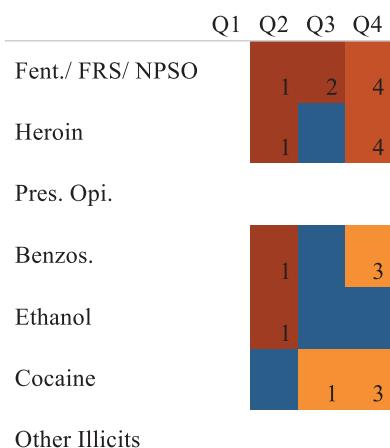
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter



Percent Change from 2015 to 2016

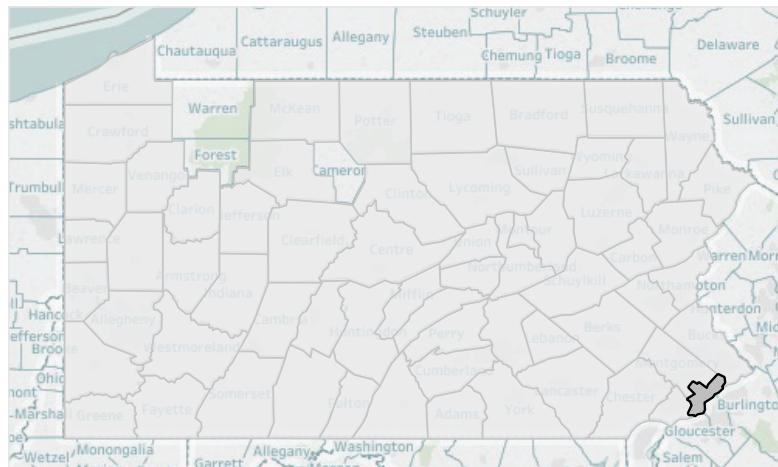
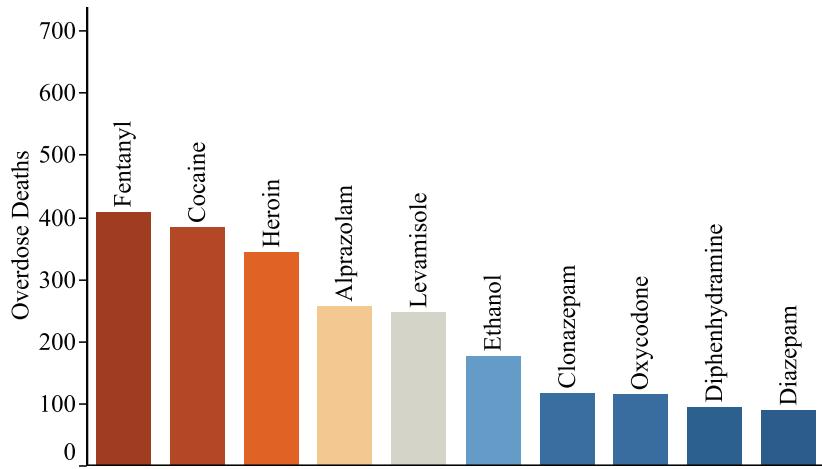


Appendix

(U) Appendix Figure 56: Analysis of Overdose Death Data within County: Philadelphia

Philadelphia

2016 Overdose Count: 907
2015 Overdose Count: 702
2016 Rank by Rate: 5
2016 Rank by Count: 1
2016 Rate: 59.44
Total Population: 1526006

**Top 10 Drugs Present in 2016 Accidental Drug-Related Overdose Deaths****Deaths by Drug Category per Quarter**

	Q1	Q2	Q3	Q4
Fent./ FRC	80	75	89	166
Heroin	71	81	82	109
Pres. Opi.	57	47	53	40
Benzos.	94	90	91	105
Ethanol	32	48	44	52
Cocaine	82	90	97	116
Other Illicit	9	17	22	26

Percent Change from 2015 to 2016**Age, Race, and Gender Distribution of Overdose Deaths in 2016**

Race	Ages	Female	Male
White	0-14		
	15-24	20	27
	25-34	42	112
	35-44	26	73
	45-54	50	77
	55-64	22	56
	65-74	4	
	75+		
Black	0-14		
	15-24	4	8
	25-34	11	21
	35-44	21	32
	45-54	27	51
	55-64	30	46
	65-74		16
	75+		
Hispanic	15-24	4	
	25-34	4	26
	35-44	8	27
	45-54		27
	55-64	4	5
	65-74		
Other	0-14		
	15-24		
	25-34		8
	35-44		
	45-54		
	55-64		
	65-74		

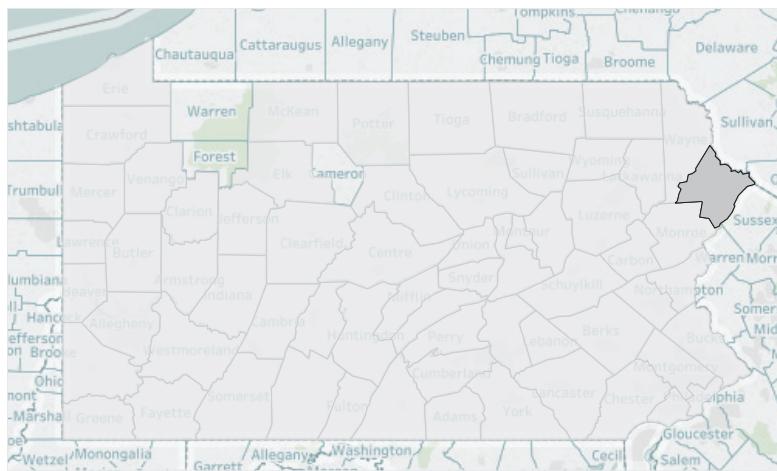
Overdose Deaths

Less More

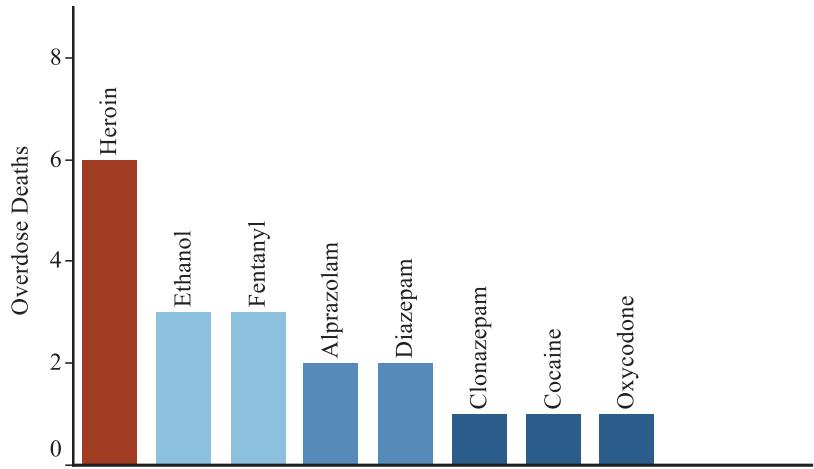
(U) Appendix Figure 57: Analysis of Overdose Death Data within County: Pike

Pike

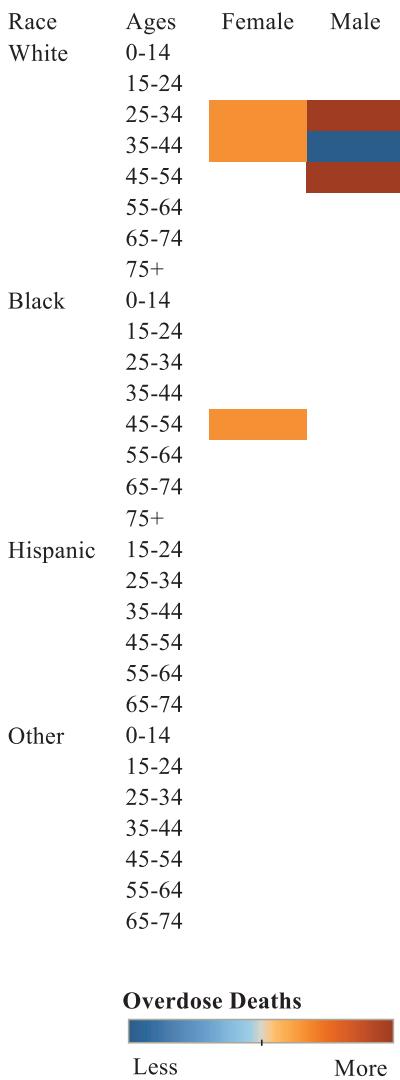
2016 Overdose Count: 10
2015 Overdose Count: 7
2016 Rank by Rate: 49
2016 Rank by Count: 40
2016 Rate: 17.43
Total Population: 57369



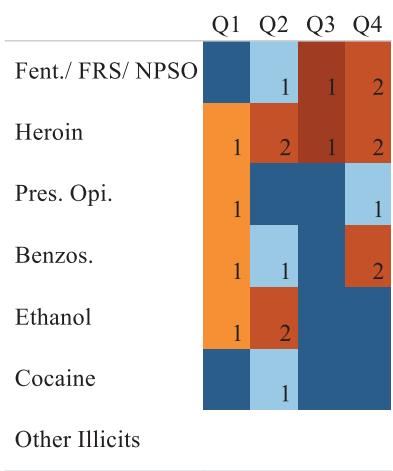
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter



Percent Change from 2015 to 2016

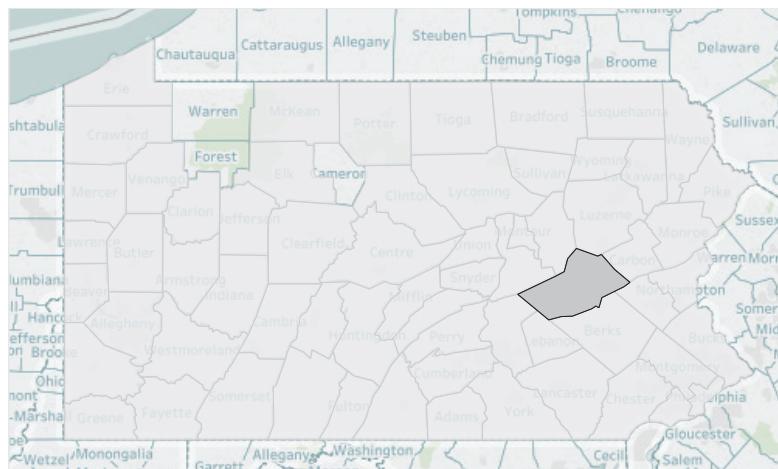


Appendix

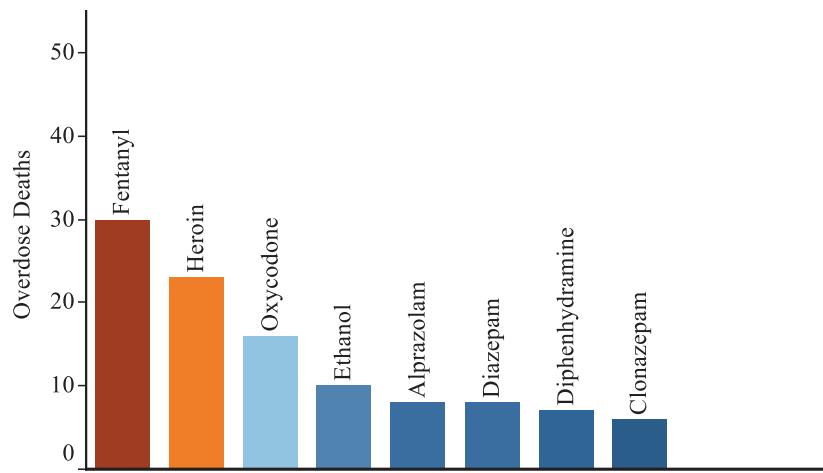
(U) Appendix Figure 58: Analysis of Overdose Death Data within County: Schuylkill

Schuylkill

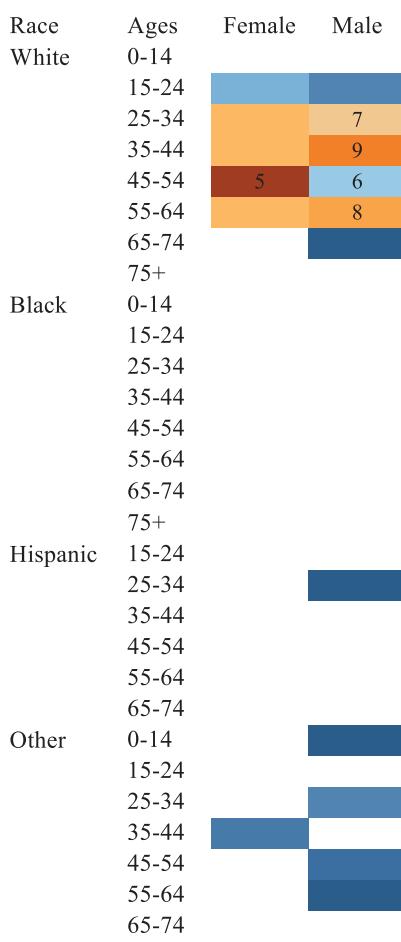
2016 Overdose Count: 59
2015 Overdose Count: 25
2016 Rank by Rate: 15
2016 Rank by Count: 21
2016 Rate: 39.79
Total Population: 148289



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	6	14	5	5
Heroin	5	10	6	2
Pres. Opi.	7	10	1	8
Benzos.	7	5	1	5
Ethanol	3	4	1	2
Cocaine				
Other Illicit	4	5	6	5

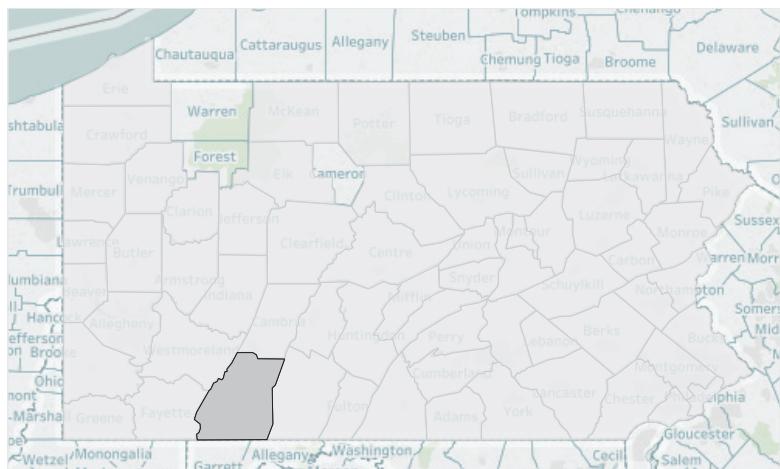
Percent Change from 2015 to 2016



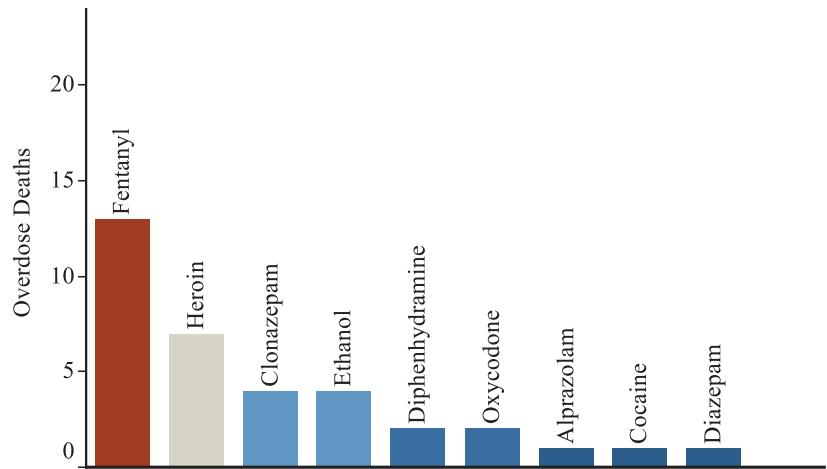
(U) Appendix Figure 59: Analysis of Overdose Death Data within County: Somerset

Somerset

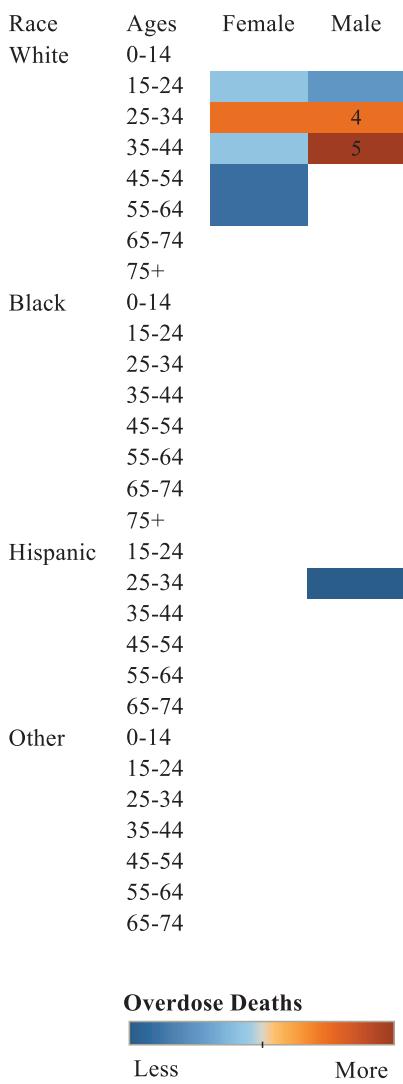
2016 Overdose Count: 21
2015 Overdose Count: 16
2016 Rank by Rate: 32
2016 Rank by Count: 33
2016 Rate: 27.01
Total Population: 77742



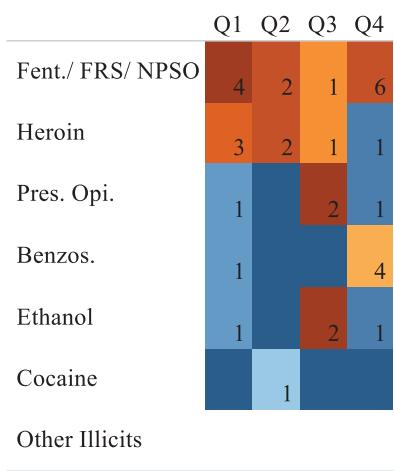
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter



Percent Change from 2015 to 2016

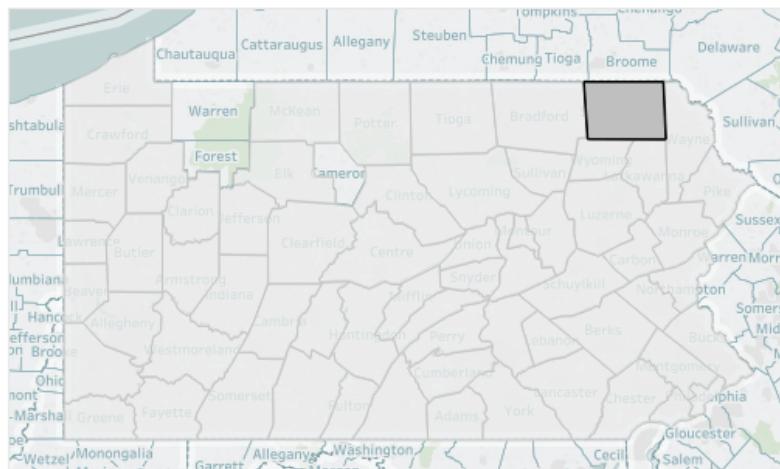


Appendix

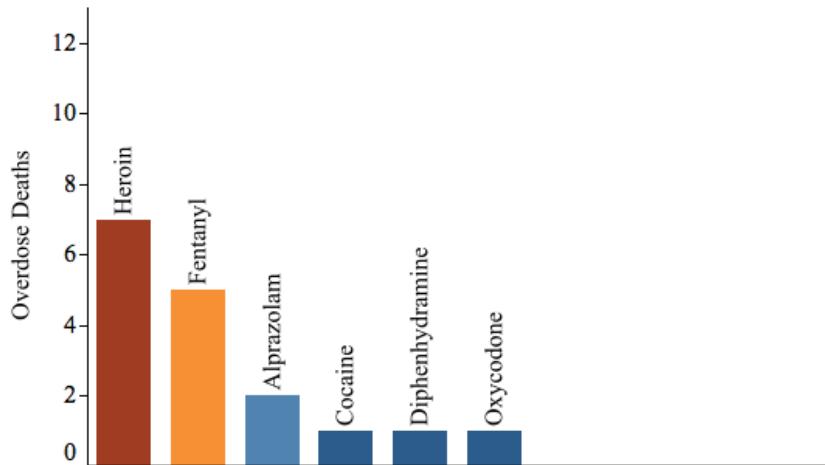
(U) Appendix Figure 60: Analysis of Overdose Death Data within County: Susquehanna

Susquehanna

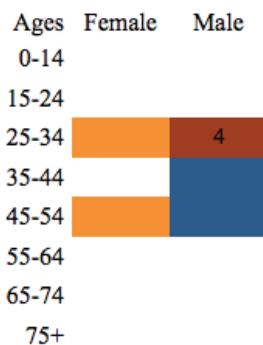
2016 Overdose Count: 8
2015 Overdose Count: 6
2016 Rank by Rate: 47
2016 Rank by Count: 42
2016 Rate: 18.45
Total Population: 43356



Top 10 Drugs Present in 2016 Accidental Drug-Related Overdose Deaths



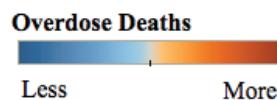
Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRC		2	1	2
Heroin		1	2	4
Pres. Opi.				1
Benzos.	1			1
Ethanol				
Cocaine				1
Other Illicit				

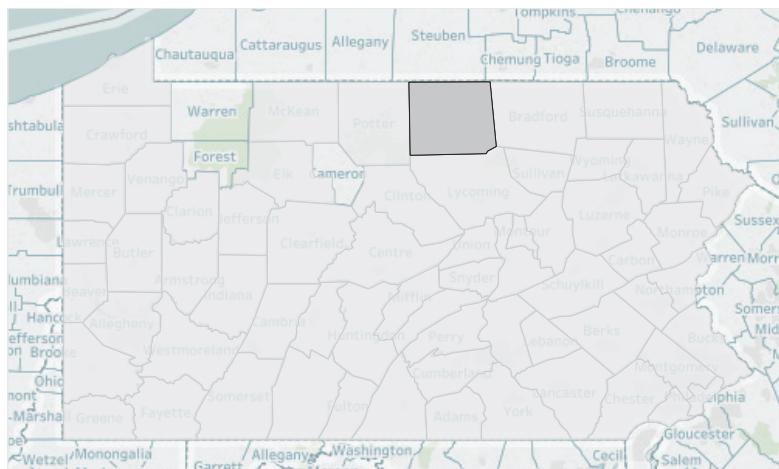
Percent Change from 2015 to 2016



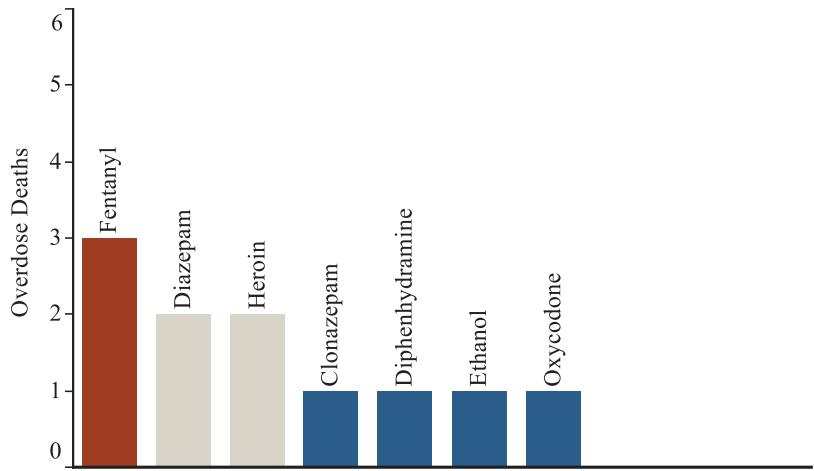
(U) Appendix Figure 61: Analysis of Overdose Death Data within County: Tioga

Tioga

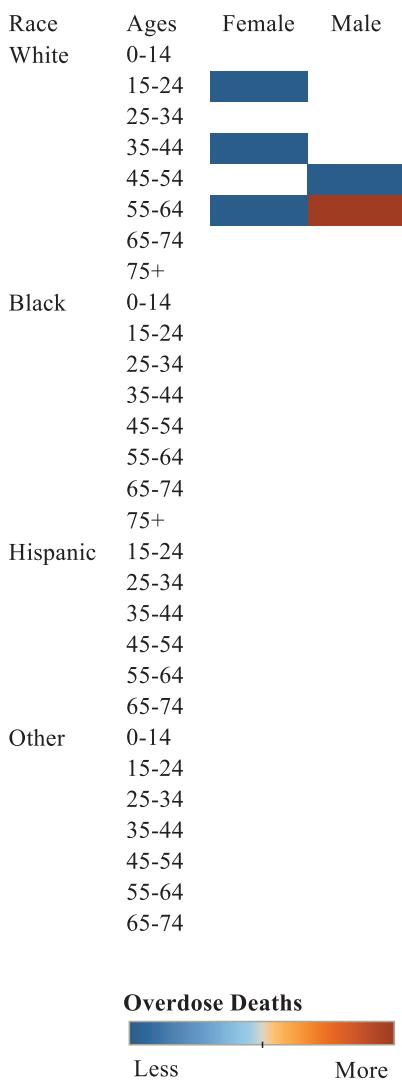
2016 Overdose Count: 6
2015 Overdose Count: 3
2016 Rank by Rate: 57
2016 Rank by Count: 44
2016 Rate: 14.29
Total Population: 41981



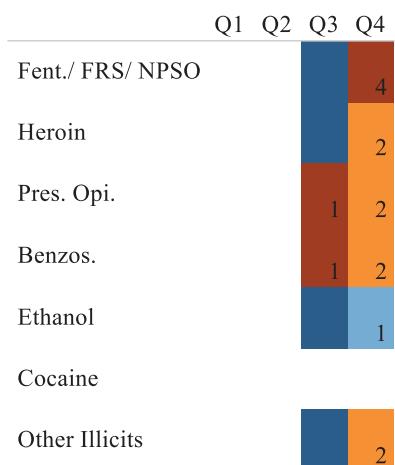
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



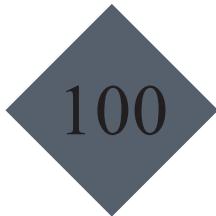
Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter



Percent Change from 2015 to 2016



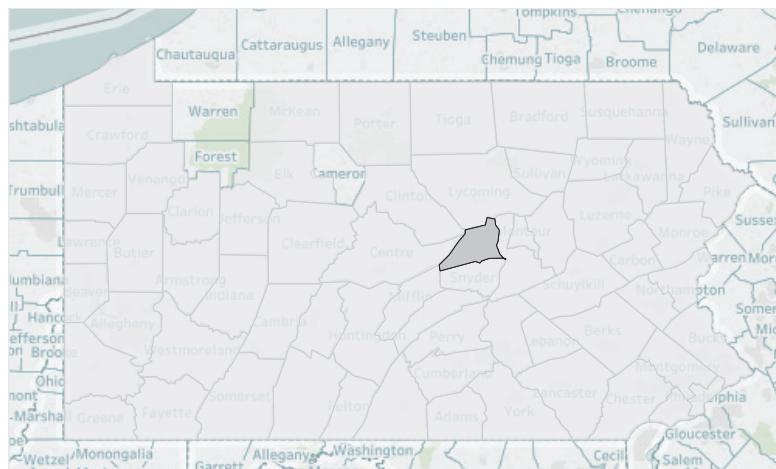
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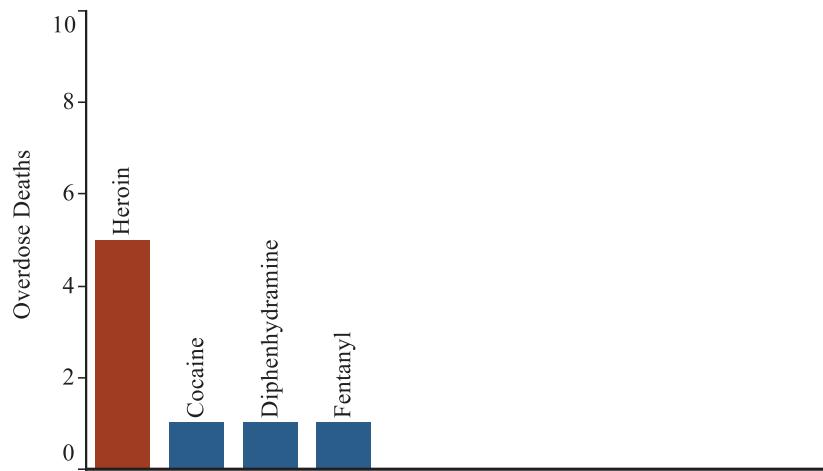
(U) Appendix Figure 62: Analysis of Overdose Death Data within County: Union

Union

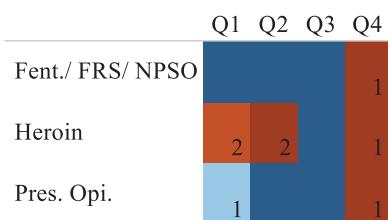
2016 Overdose Count:	7
2015 Overdose Count:	2
2016 Rank by Rate:	53
2016 Rank by Count:	43
2016 Rate:	15.57
Total Population:	44947



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Deaths by Drug Category per Quarter



Percent Change from 2015 to 2016



Benzos.

Ethanol

Cocaine

Other Ill

Age, Race, and Gender Distribution of Overdose Deaths in 2016

A stacked bar chart illustrating the distribution of the population across various demographic categories. The y-axis lists age groups from 0-14 to 75+. The x-axis shows race (White, Black, Hispanic, Other) and gender (Female, Male). The legend indicates income levels: Low Income (light gray), Middle Income (dark blue), and High Income (dark red).

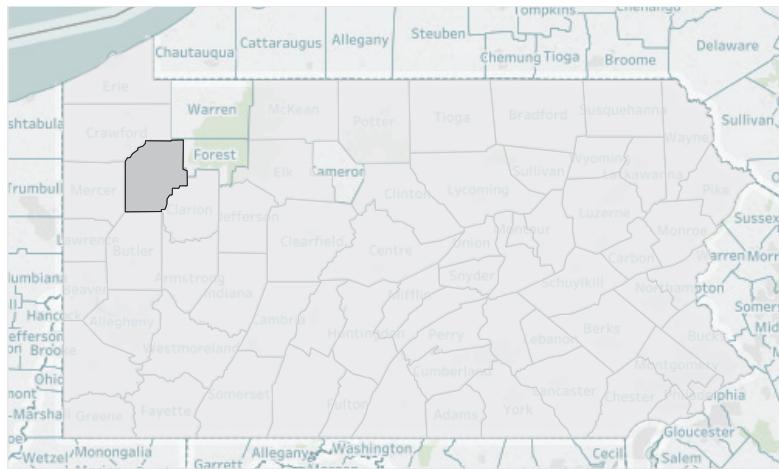
Race	Age Group	Gender	Income Level	Percentage
White	0-14	Female	Low Income	~15%
	15-24		Low Income	~10%
	25-34		Low Income	~10%
	35-44		Low Income	~10%
	45-54		Low Income	~10%
	55-64		Low Income	~10%
	65-74		Low Income	~10%
Black	0-14	Female	Low Income	~15%
	15-24		Low Income	~10%
	25-34		Low Income	~10%
	35-44		Low Income	~10%
	45-54		Low Income	~10%
	55-64		Low Income	~10%
	65-74		Low Income	~10%
Hispanic	0-14	Female	Low Income	~15%
	15-24		Low Income	~10%
	25-34		Low Income	~10%
	35-44		Low Income	~10%
	45-54		Low Income	~10%
	55-64		Low Income	~10%
	65-74		Low Income	~10%
Other	0-14	Female	Low Income	~15%
	15-24		Low Income	~10%
	25-34		Low Income	~10%
	35-44		Low Income	~10%
	45-54		Low Income	~10%
	55-64		Low Income	~10%
	65-74		Low Income	~10%
White	0-14	Male	Low Income	~15%
	15-24		Low Income	~10%
	25-34		Low Income	~10%
	35-44		Low Income	~10%
	45-54		Low Income	~10%
	55-64		Low Income	~10%
	65-74		Low Income	~10%
Black	0-14	Male	Low Income	~15%
	15-24		Low Income	~10%
	25-34		Low Income	~10%
	35-44		Low Income	~10%
	45-54		Low Income	~10%
	55-64		Low Income	~10%
	65-74		Low Income	~10%
Hispanic	0-14	Male	Low Income	~15%
	15-24		Low Income	~10%
	25-34		Low Income	~10%
	35-44		Low Income	~10%
	45-54		Low Income	~10%
	55-64		Low Income	~10%
	65-74		Low Income	~10%
Other	0-14	Male	Low Income	~15%
	15-24		Low Income	~10%
	25-34		Low Income	~10%
	35-44		Low Income	~10%
	45-54		Low Income	~10%
	55-64		Low Income	~10%
	65-74		Low Income	~10%



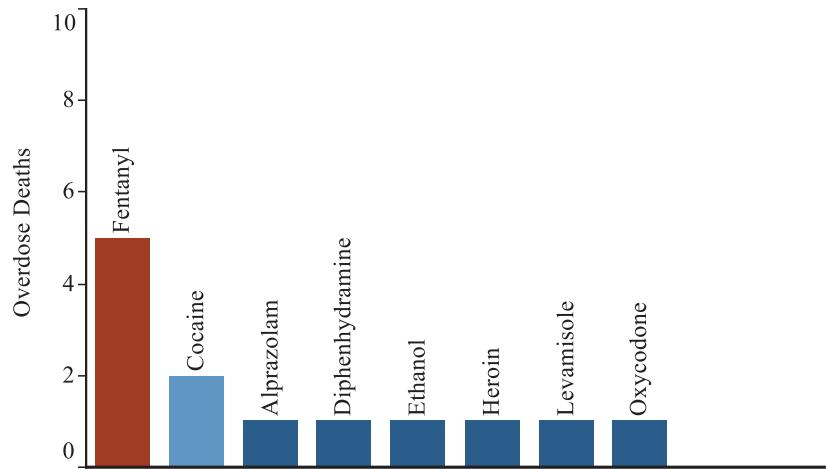
(U) Appendix Figure 63: Analysis of Overdose Death Data within County: Venango

Venango

2016 Overdose Count: 9
2015 Overdose Count: 11
2016 Rank by Rate: 50
2016 Rank by Count: 41
2016 Rate: 16.37
Total Population: 54984



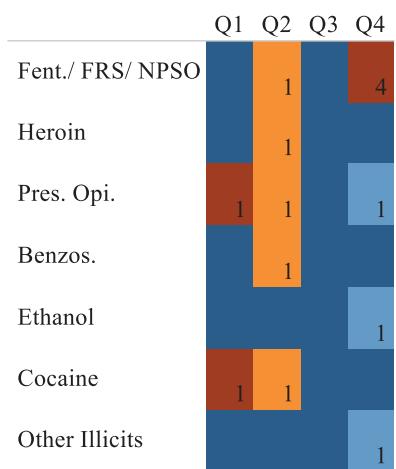
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016

Race	Ages	Female	Male
White	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
Black	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
Hispanic	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
Other	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		

Deaths by Drug Category per Quarter



Percent Change from 2015 to 2016



Overdose Deaths



Source: Pennsylvania Coroner/Medical Examiner Data

Appendix

(U) Appendix Figure 64: Analysis of Overdose Death Data within County: Washington

Washington

2016 Overdose Count: 106

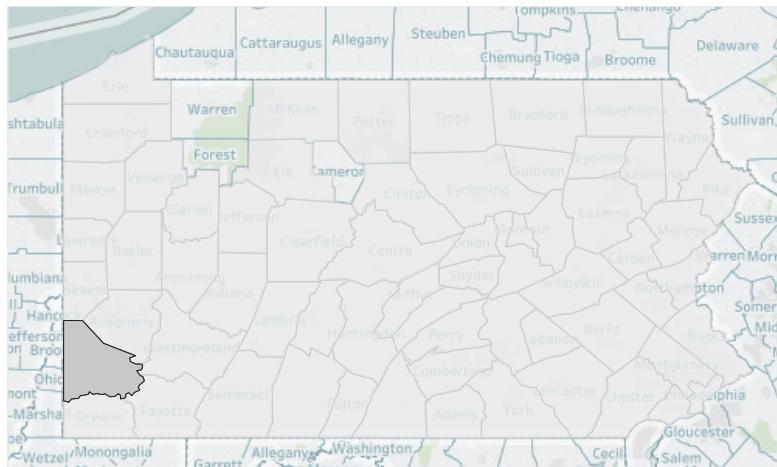
2015 Overdose Count: 73

2016 Rank by Rate: 7

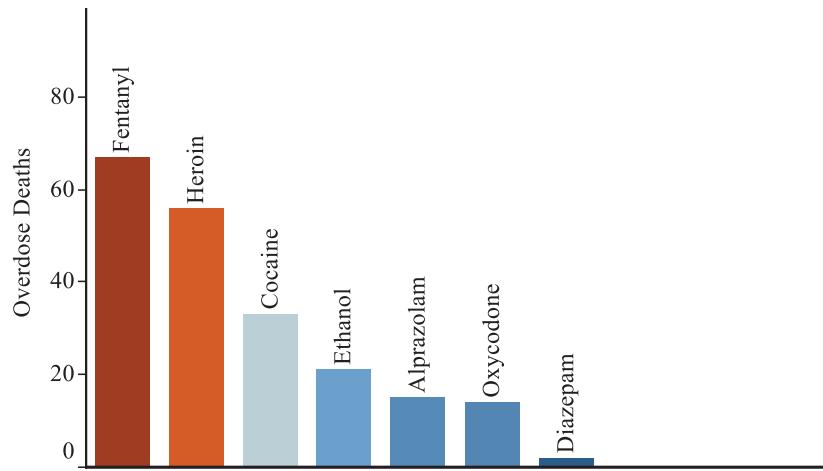
2016 Rank by Count: 12

2016 Rate: 51.01

Total Population: 207820



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



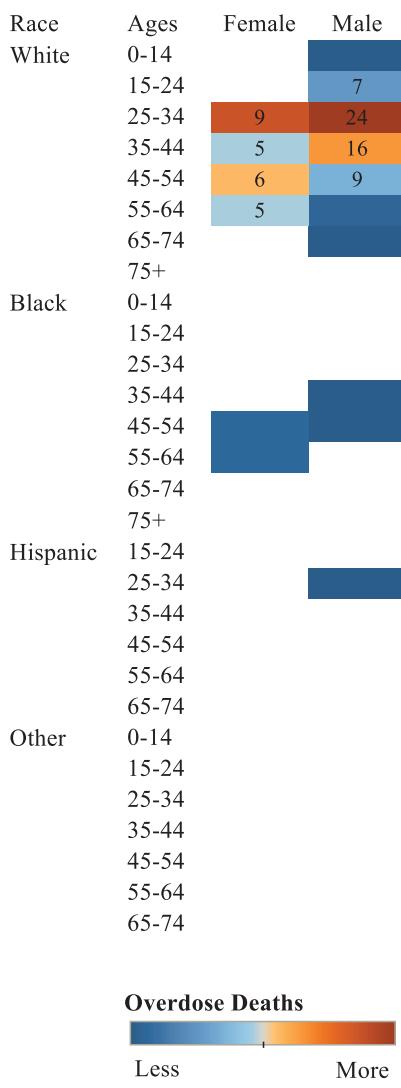
Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	12	4	20	31
Heroin	17	5	21	13
Pres. Opi.	6	4	11	10
Benzos.	3	7	9	4
Ethanol	6	1	7	7
Cocaine	8	4	10	11
Other Ilicit				2

Percent Change from 2015 to 2016



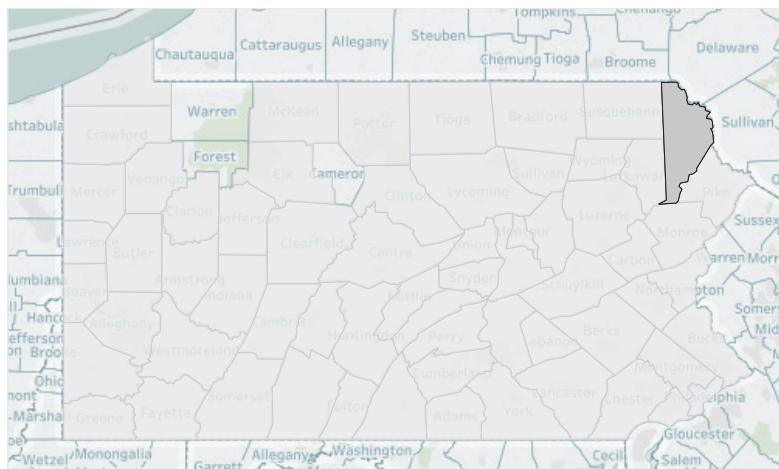
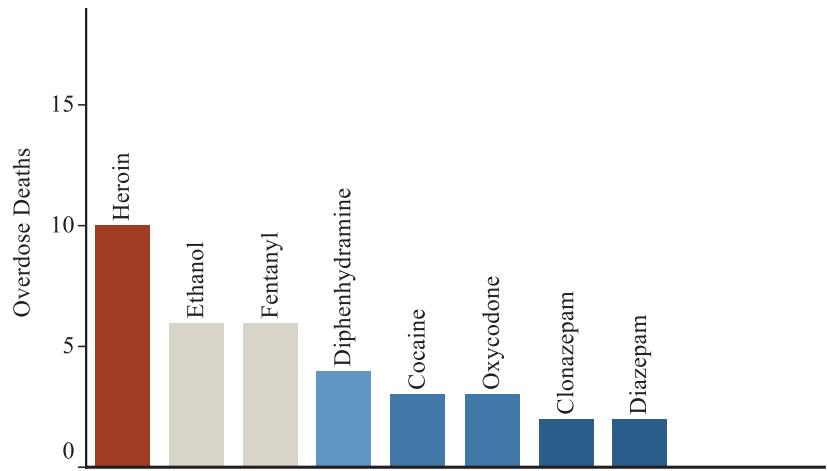
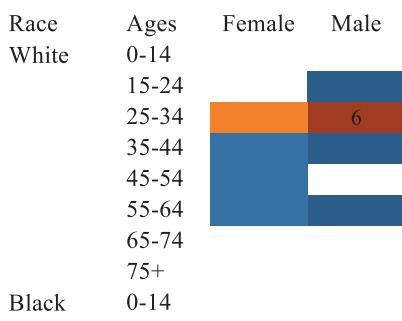
Age, Race, and Gender Distribution of Overdose Deaths in 2016



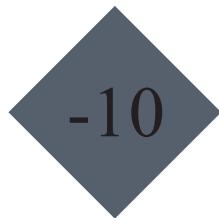
(U) Appendix Figure 65: Analysis of Overdose Death Data within County: Wayne

Wayne

2016 Overdose Count: 17
2015 Overdose Count: 19
2016 Rank by Rate: 21
2016 Rank by Count: 37
2016 Rate: 32.18
Total Population: 52822

**Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths****Age, Race, and Gender Distribution of Overdose Deaths in 2016****Deaths by Drug Category per Quarter**

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	2	1	3	1
Heroin	1	1	6	2
Pres. Opi.	3	1	2	2
Benzos.	2	1	1	1
Ethanol	1	2	2	1
Cocaine			3	
Other Illicit				

Percent Change from 2015 to 2016

Source: Pennsylvania Coroner/Medical Examiner Data

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(U) Appendix Figure 66: Analysis of Overdose Death Data within County: Westmoreland

Westmoreland

2016 Overdose Count: 174

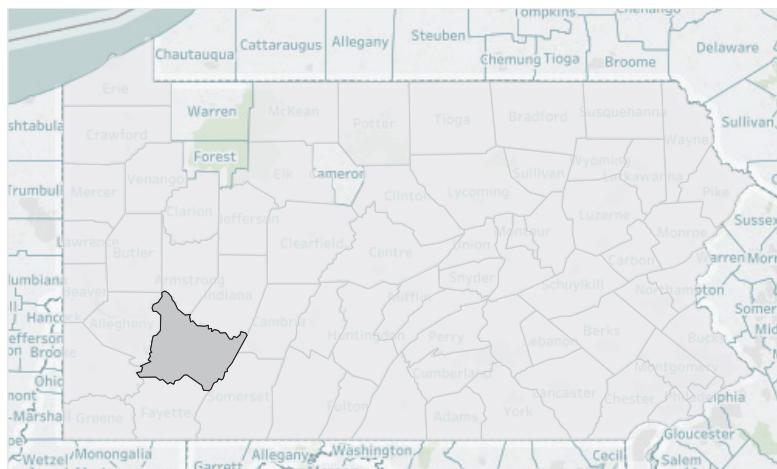
2015 Overdose Count: 126

2016 Rank by Rate: 10

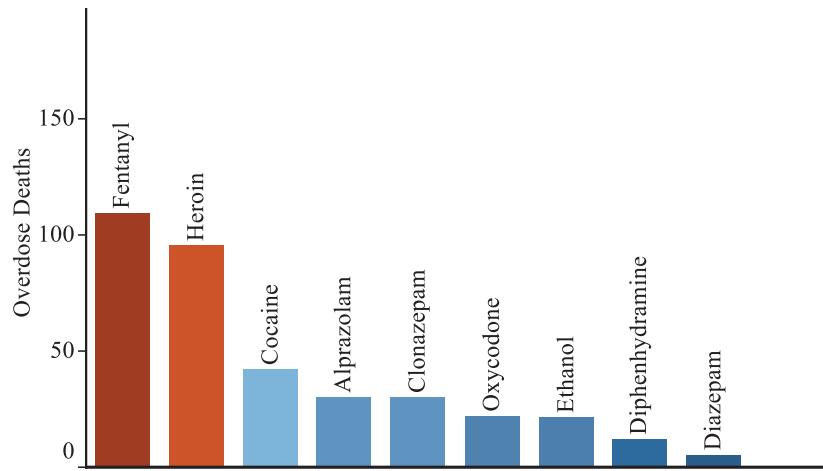
2016 Rank by Count: 5

2016 Rate: 47.65

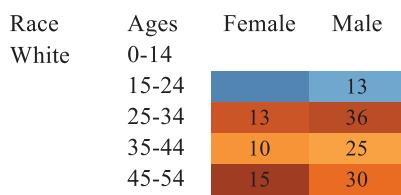
Total Population: 365169



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



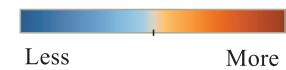
Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	15	16	24	55
Heroin	24	19	23	29
Pres. Opi.	13	4	8	10
Benzos.	13	14	12	19
Ethanol	5	7	4	5
Cocaine	8	9	10	15
Other Ilicit		3		2

Percent Change from 2015 to 2016



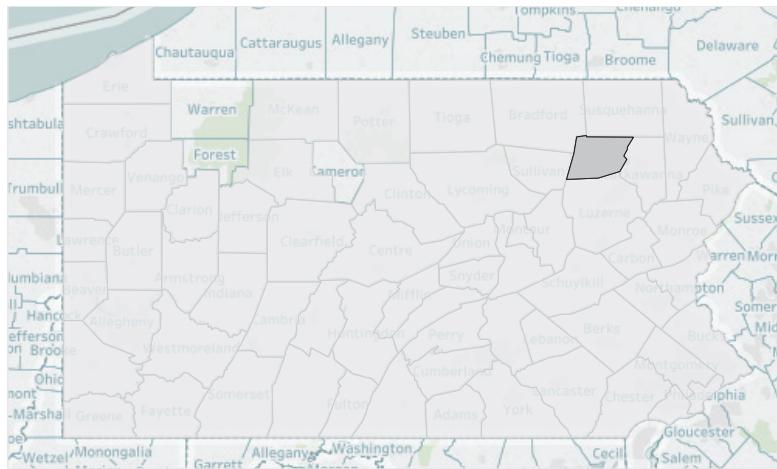
Overdose Deaths



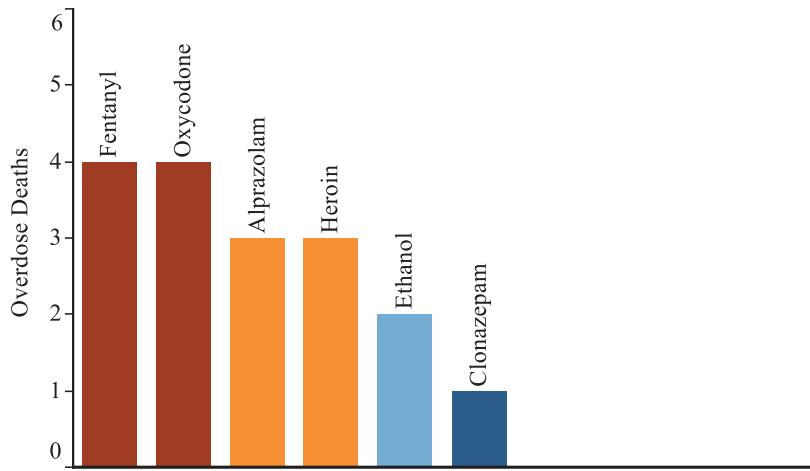
(U) Appendix Figure 67: Analysis of Overdose Death Data within County: Wyoming

Wyoming

2016 Overdose Count: 7
2015 Overdose Count: 7
2016 Rank by Rate: 39
2016 Rank by Count: 43
2016 Rate: 24.76
Total Population: 28276



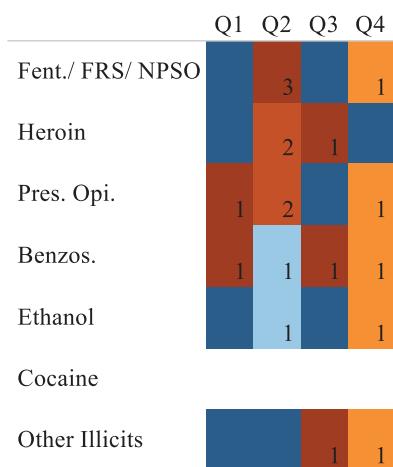
Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



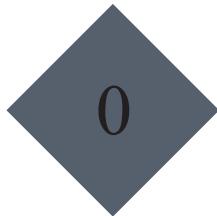
Age, Race, and Gender Distribution of Overdose Deaths in 2016

Race	Ages	Female	Male
White	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
Black	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
Hispanic	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		
	75+		
Other	0-14		
	15-24		
	25-34		
	35-44		
	45-54		
	55-64		
	65-74		

Deaths by Drug Category per Quarter



Percent Change from 2015 to 2016



Source: Pennsylvania Coroner/Medical Examiner Data

Appendix

(U) Appendix Figure 68: Analysis of Overdose Death Data within County: York

York

2016 Overdose Count: 127

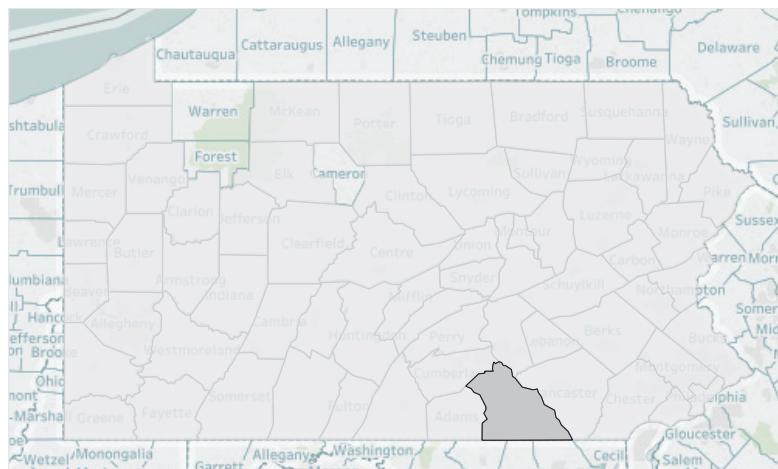
2015 Overdose Count: 99

2016 Rank by Rate: 25

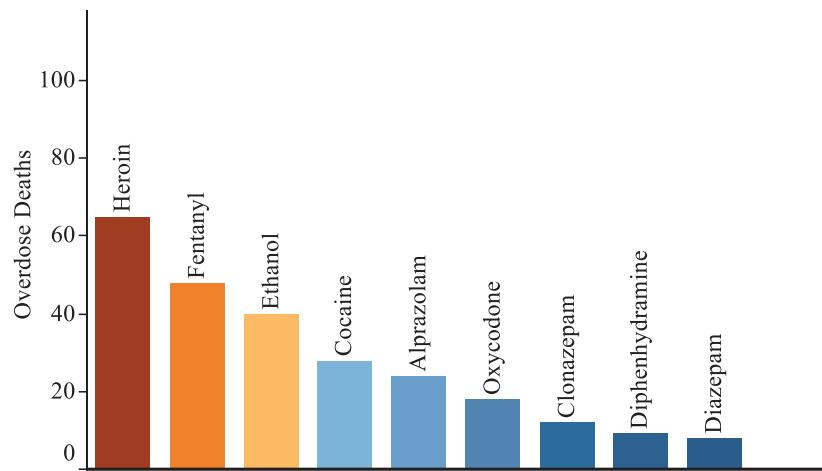
2016 Rank by Count: 9

2016 Rate: 29.20

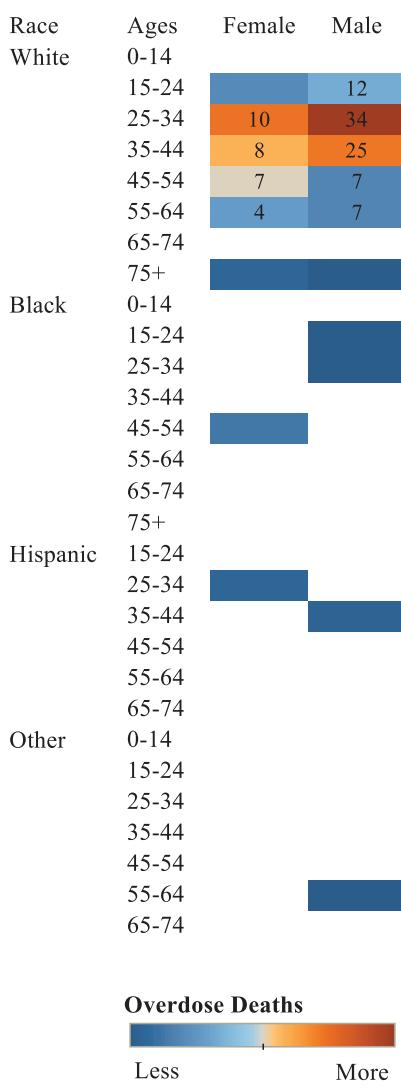
Total Population: 434972



Top 10 Drugs Present in 2016 Drug-Related Overdose Deaths



Age, Race, and Gender Distribution of Overdose Deaths in 2016



Deaths by Drug Category per Quarter

	Q1	Q2	Q3	Q4
Fent./ FRS/ NPSO	12	8	12	22
Heroin	17	9	22	17
Pres. Opi.	4	7	7	9
Benzos.	12	9	15	8
Ethanol	6	4	13	17
Cocaine	8	2	5	13
Other Illicit		1		

Percent Change from 2015 to 2016



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