Opioid-Related Overdose Deaths in Allegheny County, 2015–2016 Update

Prepared by the Allegheny County Department of Human Services and the Allegheny County Health Department

FEBRUARY 2018

TABLE OF CONTENTS

FIGURES

TABLES

ACRONYMS AND DEFINITIONS

ACHD: Allegheny County Health Department

ACJ: Allegheny County Jail

ACOME: Allegheny County Office of the Medical Examiner

Age-Adjusted Rate: A statistical process applied to rates of death or disease, which enables comparisons between communities with different age structures.

Benzodiazepines: A class of drugs commonly used to treat anxiety (e.g., Valium, Xanax)

Buprenorphine: A medication used to treat opioid-use disorders often as a component of medication-assisted treatment (MAT). It is commonly known as Suboxone.

Cohort: A group of people who share a characteristic, such as age

Community Care Behavioral Health Organization: A nonprofit behavioral health managed care organization (BH-MCO) that manages the Allegheny County HealthChoices program on behalf of DHS

Data Warehouse: Allegheny County's electronic repository of information pertaining to publicly funded human services utilization. The Data Warehouse contains approximately 2 billion records representing more than one million distinct clients, and includes data from 35 sources representing human services program areas ranging from behavioral health and aging to public benefits, housing, criminal justice and public schools. These data can be used to describe the encounters or service history of individuals over time across both internal and external service providers and systems.

DHS: [Allegheny County] Department of Human Services, which is the organization responsible for providing and administering publicly funded human services to Allegheny County residents. DHS works to meet human service needs, particularly for the County's most vulnerable populations, through an extensive range of information exchange, prevention, early intervention, case management, crisis intervention and after-care services.

EMS: Emergency Medical Services

Fentanyl: A powerful opioid medication with medical applications that is increasingly synthetically produced and present in illicit opioids such as street heroin

Fentanyl analogues: Synthetic opioids similar in chemical structure to fentanyl that are increasingly present in street heroin, some estimated to be 400–6,000 times more potent than morphine

HealthChoices: Pennsylvania's Medicaid Managed Care Program, which has both a physical and a behavioral health component. Under the behavioral health component, counties are required to ensure timely access to quality mental health and drug and alcohol services. These services are managed through a behavioral health managed care organization (BH-MCO) and delivered by various community- and hospital-based providers.

Hydrocodone: A semi-synthetic opioid medication used to treat pain (commonly known by the brand name Vicodin) and used in liquid form as a cough suppressant

Hydromorphone: An opioid medication made from morphine; sold under the brand name Dilaudid

Methadone: A medication used to treat opiate-use disorders in methadone maintenance treatment (MMT)

MMT: Methadone maintenance treatment is a comprehensive medication-assisted treatment (MAT) modality that involves the long-term prescribing of methadone and includes therapy and other medical and social services.

Naloxone Hydrochloride: Generic name for the opiate overdose antidote also known as Narcan

Opioids: Opioids is a class of drugs that includes the illegal drug heroin, synthetic opioids such as fentanyl, and pain relievers available legally by prescription, such as oxycodone (OxyContin), hydrocodone (Vicodin), codeine, morphine and many others.[1]

[1] National Institute of Drug Abuse (NIDA). https://www.drugabuse.gov/drugs-abuse/opioids

Oxycodone: A semi-synthetic opioid analgesic commonly known as OxyContin

Oxymorphone: A semi-synthetic opioid analgesic; sold under the brand name Numorphan

Suboxone: Brand name of buprenorphine, a treatment medication used to treat opiate-use disorders often as a component of medication-assisted treatment (MAT)

SUD: Substance use disorder

Vivitrol: The injectable extended-release form of the drug naltrexone that is administered through intramuscular injections once per month

INTRODUCTION

There were 986 accidental drug overdose deaths that occurred in Allegheny County during 2015 and 2016. Ninety percent of the overdose deaths in 2015 and 93 percent in 2016 were opioid-related. 2016 represented the third consecutive year in which the number of fatal overdoses was higher than in any prior year. This trend can largely be attributed to an increase in the presence of the synthetic opioid fentanyl. In fact, at least 70 percent of the opioid-related overdose deaths that year involved fentanyl and its analogues.

This report, a joint effort of the Allegheny County Department of Human Services (DHS) and the Allegheny County Health Department (ACHD), provides an update to an earlier report that analyzed available data sources on opiate overdoses in the County from 2008 through 2014.[2,3] This report covers the time period January 1, 2015 through December 31, 2016 with the following goals:

- Use data to better understand risk factors for opioid overdose in Allegheny County
- Identify opportunities for intervention
- Provide recommendations for policymakers and other multi-sector overdose initiatives in the region based on available data
- Empower stakeholders by providing them with information relevant to their role in the crisis

KEY FINDINGS AND CHANGES SINCE THE PRIOR REPORT

Our findings indicate several changes to the epidemic dynamic that occurred during this reporting period that may be relevant to policy and intervention planning. We list them here and discuss interpretations, implications and recommendations for these findings in detail toward the end of the report.

- The age-adjusted rate for opioid-related overdose fatalities in the County was much higher than state or national rates. We discuss some of the potential reasons for this difference.

[2] Opiate-Related Overdose Deaths in Allegheny County: Risks and Opportunities for Intervention (2016). Available online: https://www.alleghenycountyanalytics.us/wp-content/uploads/2017/04/Opiate-Related-Overdose-Deaths-in-Allegheny-County.pdf

[3] Please note that the County's ability to identify and classify opioids and other substances involved in overdose deaths is constantly improving. Therefore, historical information from prior years has been updated in this report, which may reflect slight differences with past reporting.

- The prevalence of fentanyl and its analogues were a major contributor to opioid-related overdose deaths during this period, accounting for 57 percent of all opioid-related overdose deaths, a threefold increase from 2014 alone.
- Prescription opioids alone were a contributing factor in 9 percent of opioid-related overdose deaths. Together with heroin, fentanyl and its analogues, prescription opioids were involved in 17 percent of the deaths during this period.
- Demographic changes
    - An increasing proportion of these overdose-related deaths in the County were among people in the 25–34-year-old age cohort.
    - The highest rates of these overdose deaths were observed among black males aged 45–64 and white males aged 25–44, respectively.
- There were some geographic changes in the prevalence of where opioid-related overdose fatalities occurred. During this period, the municipalities of Penn Hills, McKeesport, West Mifflin, Shaler, McKees Rocks and Monroeville were the most affected by the number of fatal overdose deaths. In the City of Pittsburgh, the neighborhoods of Carrick, Brookline, Beechview, Bloomfield and Mount Washington were most affected. The City of Pittsburgh accounted for the largest number of deaths in Allegheny County.
- The percentage of people who were actively enrolled in HealthChoices (i.e., Medicaid) within 90 days of their death increased from 45 percent during the 2008–2014 period to 51 percent (463 of the 910) during this period. While the total number of people who died represented a small proportion of HealthChoices members, it is significant that over half of the people who died were enrolled in this public health insurance program.

ANALYTIC APPROACH

Our approach to this report was to establish a cohort of opioid-related overdose deaths that occurred during this period and review all available data from the Data Warehouse about these individuals to understand where there may be opportunities for intervention. Additional analysis was conducted using aggregate data from other data sources (e.g., emergency medical services and hospital emergency department admissions).

Allegheny County Office of the Medical Examiner

The Allegheny County Office of the Medical Examiner (ACOME) is required to autopsy all premature and unexplained deaths that may have resulted from a sudden, violent or traumatic event. Autopsy reports from the ACOME were used to identify individuals whose autopsy results indicated that they died of an accidental overdose death during the period of study. There were 986 autopsy reports coded as accidental fatal overdose deaths within the County from 2015 through 2016. These results were then filtered to select only those individuals who died from an opioid-related overdose within Allegheny County, resulting in a cohort of 910 people.

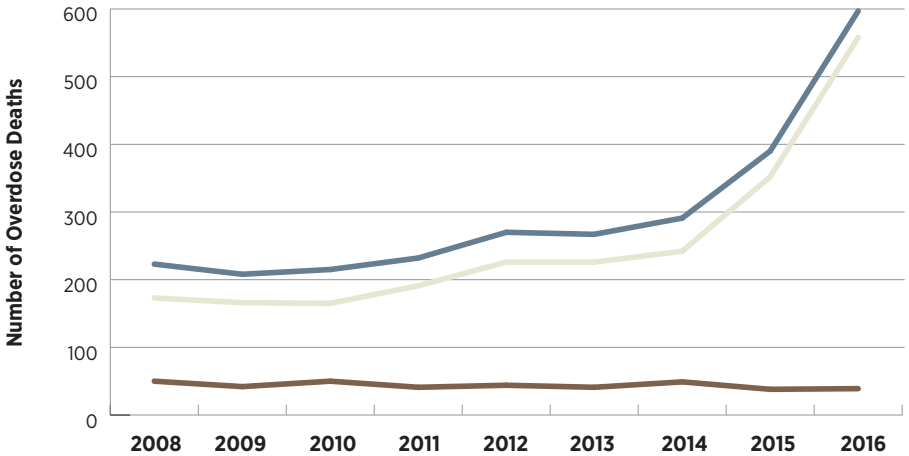
Data Warehouse

The Data Warehouse was then used to match these individuals to any other available records from encounters with other services or systems known to DHS or its partners. The Data Warehouse is an electronic repository of information pertaining to publicly funded human service utilization in Allegheny County. It includes data from 35 sources representing program areas (both internal and external to DHS) ranging from Medicaid- and County-funded behavioral health, aging, public benefits, homelessness and housing, criminal justice, and public schools. These data can be used to describe the encounters or service history of individuals over time across both internal and external service providers and systems.

OVERDOSE MORTALITY

Deaths from opioid-related overdoses in Allegheny County have been increasing at a rapid rate since 2013. **Figure 1** below describes accidental overdose deaths and distinguishes between opioid-related deaths and deaths from other drugs.

FIGURE 1: **Accidental Overdose Deaths in Allegheny County: 2008–2016**



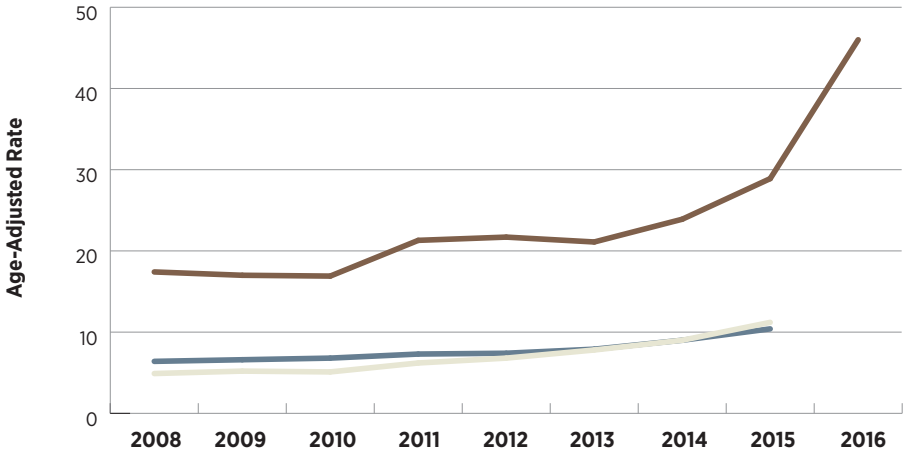
	2008	2009	2010	2011	2012	2013	2014	2015	2016
Non-Opioid	50	42	50	41	44	41	49	38	39
Opioid-Related	173	166	165	191	226	226	242	352	558
All Drugs	223	208	215	232	270	267	291	389	597

Age-adjusted opioid-related fatal overdose rates for Allegheny County were much higher than in both Pennsylvania and the U.S. (see **Figure 2**).[4] Additionally, homicide and suicide rates in Allegheny County are also frequently higher than state and national averages.

[4] Age-adjusted opioid-related overdose death rates for Pennsylvania and the U.S. during the period 2008–2015 were provided by Henry J. Kaiser Family Foundation; data is available at: http://www.kff.org/state-category/health-stat U.S./opioids/. Note: 2010 U.S. standard population was used to calculate Allegheny County whereas Kaiser studied an earlier and longer period and used a 2000 U.S. standard population. Data for 2016 was available for Allegheny County and was included in this figure.

FIGURE 2: **Age-Adjusted Opioid-Related Overdose Rates (per 100,000) in Allegheny County: 2008–2016**[5]

[5] 2016 national and state data were not available at the time of this report.



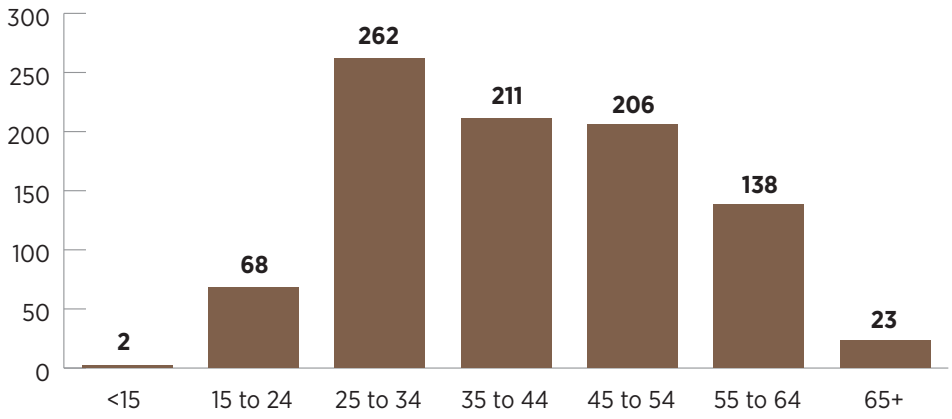
	2008	2009	2010	2011	2012	2013	2014	2015	2016
Allegheny County	17.4	17.0	16.9	21.3	21.7	21.1	23.9	28.9	46.0
Pennsylvania	4.9	5.2	5.1	6.2	6.8	7.8	9.0	11.2	
U.S.	6.4	6.6	6.8	7.3	7.4	7.9	9.0	10.4	

When looking at overdose fatalities by legal sex, more males (71%) than females (29%) died. This was comparable to 2014, where men accounted for 68 percent of opioid-related overdose fatalities.

Demographics

Overdose deaths among the 25–34 age group during 2015–2016 outnumbered all other age groups (see **Figure 3** below) and accounted for a larger proportion of the deaths. During the prior report period, 2008–2014, deaths increased the fastest among this age group, but the proportions of deaths were similar in the three age groups ranging from 25 to 54 years old.

FIGURE 3: **Opioid-Related Overdose Deaths by Age: 2015–2016 (n=910)**



The proportion of fatalities among white individuals (790 or 87%) was higher than U.S. Census population estimates (80%), while those among black individuals (113 or 12%) were slightly lower than U.S. Census population estimates (13%).[6] However, the median age among black overdose victims was higher than U.S. Census population estimates (49 vs. 38 years old).

[6] There were only seven overdose victims with a race other than white or black per ACOME records.

Table 1 below lists the number of fatal opioid-related overdose deaths by age, race, and sex. White males continued to account for most opioid-related overdose fatalities during this period.

TABLE 1: **Opioid-Related Overdose Deaths by Age, Race and Legal Sex: 2015–2016 (n=910)**

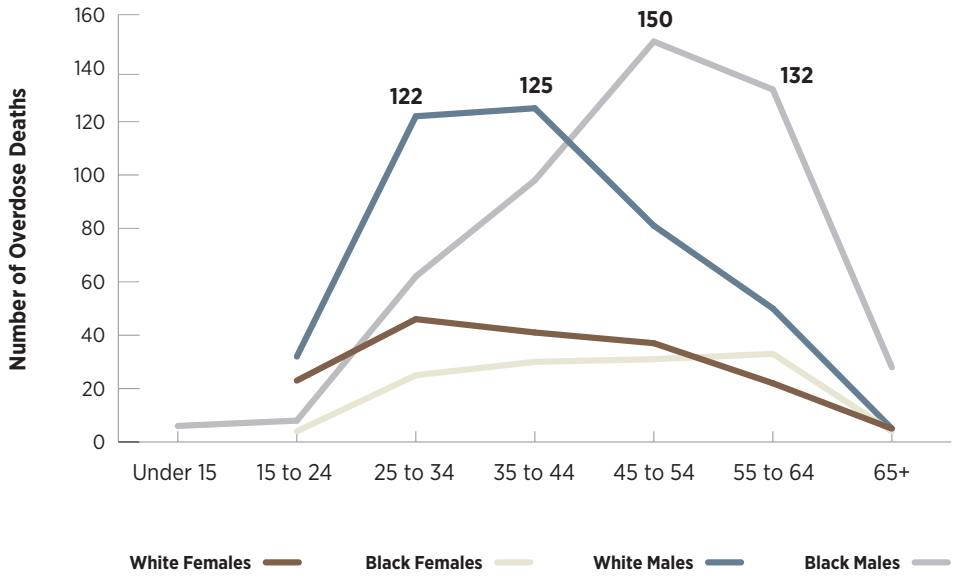
AGE GROUP	FEMALE				MALE				GRAND TOTAL
	WHITE	BLACK	OTHER	TOTAL	WHITE	BLACK	OTHER	TOTAL	
Under 15						2		2	**2**
15 to 24	27	1		28	38	2		40	**68**
25 to 34 years	64	6		70	177	12	3	192	**262**
35 to 44 years	46	6		52	143	16		159	**211**
45 to 54 years	55	7	1	63	115	27	1	143	**206**
55 to 64	34	7	1	42	73	22	1	96	**138**
65+	10	1		11	8	4		12	**23**
Total	**236**	**28**	**2**	**266**	**554**	**85**	**5**	**644**	**910**

Considering these factors identified among the individuals who died, the groups who had the highest death rates, respectively, include black males aged 45–64 and white males 25–44 years old (see **Figure 4**).[7]

[7] Crude death rates per 100,000 for Allegheny County are presented.

[8] Because there were only seven overdose victims with a race other than black or white, rates were not calculated.

FIGURE 4: **Average Annual Age-, Race-, and Sex-Specific Death Rates for Opioid-Related Overdoses: 2015–2016 (n=903)**[8]



Substance Type

Fentanyl and its analogues were a major contributor to opioid-related overdose deaths during this period. While fentanyl contributed to fewer than 20 of the opioid-related overdose fatalities each year during the period 2008–13, in 2014 it contributed to 52 (20% of 255). In the period reviewed for this report, fentanyl, along with its analogues, was a contributing factor in 57 percent of all opioid-related overdose deaths. Benzodiazepines and cocaine remained a contributing factor in opioid-related overdose deaths. During the previous period, benzodiazepine involvement peaked in 2009 at 38 percent of all opioid-related overdose fatalities and has steadily decreased to 26 percent in 2016. During the previous period, cocaine involvement was highest in 2008 at 33 percent, steadily decreased to 18 percent in 2012, and has steadily increased to reach 31 percent in 2016. **Table 2** summarizes the involvement of fentanyl, fentanyl analogues, benzodiazepines, and cocaine among opioid-related overdose fatalities during the period of study. Most of the autopsies (83%, or 758 of 910) indicated that more than one substance was a contributing factor in these deaths.

Prescription opioids (oxycodone, oxymorphone, hydrocodone, hydromorphone) were a contributing factor in 17 percent (157 of 910) of the opioid-related overdose deaths; prescription opioids alone (with no heroin or fentanyl involved) were a contributing factor in 9 percent (84 of 910). Buprenorphine (commonly known as Suboxone), a drug used to treat opioid dependence often as a component of medication-assisted treatment, was a contributing factor in just one of the 910 deaths, which was similar to the previous period studied. While it has been controversial and is sometimes viewed with skepticism as a treatment because it does have some abuse potential and street value, buprenorphine has not played a strong role in directly contributing to fatal overdoses in the County.

TABLE 2: **Fentanyl, Fentanyl-Analog and Cocaine Involvement Among Opioid-Related Overdose Deaths: 2015–16 (n=910)**[9]

[9] There are duplications in these counts due to multiple contributing factors.

	2015		2016		GRAND TOTAL	
	#	%	#	%	#	%
Total	**389**		**597**		**986**	
Opioids	352	90.5%	558	93.5%	910	92.3%
Fentanyl	127	36.1%	391	70.1%	518	56.9%
Fentanyl Analogues	28	8.0%	28	5.0%	56	6.2%
Benzodiazepines	92	26.1%	157	28.1%	249	27.4%
Cocaine	93	26.4%	175	31.4%	268	29.5%

LOCATION OF OVERDOSE DEATHS

Summarizing opioid-related overdose fatalities by geography identifies how municipalities and City of Pittsburgh neighborhoods have been affected to help guide intervention efforts among stakeholders.

Municipalities

The top ten ranked municipalities by number of deaths and average annual death rate are listed in the tables and figure below. While the City of Pittsburgh accounted for the largest number of deaths (324, or 36%) in Allegheny County, Penn Hills, McKeesport, West Mifflin, Shaler, McKees Rocks and Monroeville were among the most affected municipalities by number of deaths.

FIGURE 5: **Opioid-Related Overdose Deaths by Allegheny County Municipality (Pittsburgh Omitted): 2015–2016 (n=586)**

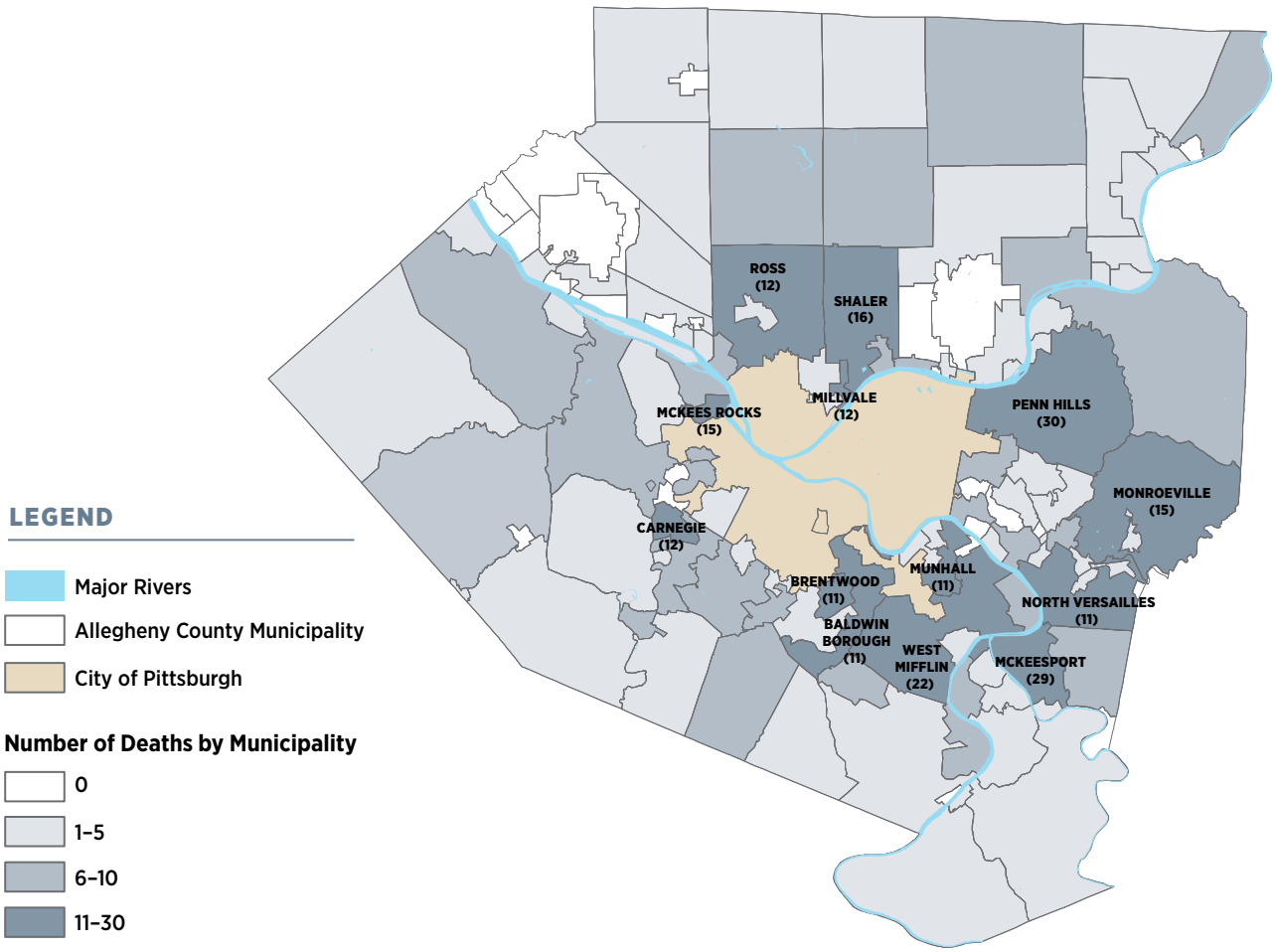


TABLE 3: **Fatal Opioid-Related Overdoses Ranked by Number of Deaths by Municipality: 2015–2016 (n=910)**

MUNICIPALITY	NUMBER OF DEATHS 2015–16	POPULATION	AVERAGE ANNUAL DEATH RATE (PER 1,000)	RANK BY NUMBER OF DEATHS
Pittsburgh	324	306,045	0.53	—
Penn Hills	30	42,292	0.35	1
McKeesport	29	19,663	0.74	2
West Mifflin	22	20,271	0.54	3
Shaler	16	28,736	0.28	4
McKees Rocks	15	6,088	1.23	5
Monroeville	15	28,365	0.26	5
Carnegie	12	7,960	0.75	7
Millvale	12	3,740	1.60	7
Ross	12	31,108	0.19	7
Baldwin Borough	11	19,791	0.28	10
Brentwood	11	9,625	0.57	10
Munhall	11	11,355	0.48	10
North Versailles	11	10,200	0.54	10
Allegheny County Total	**910**	**1,194,624**	**0.37**	

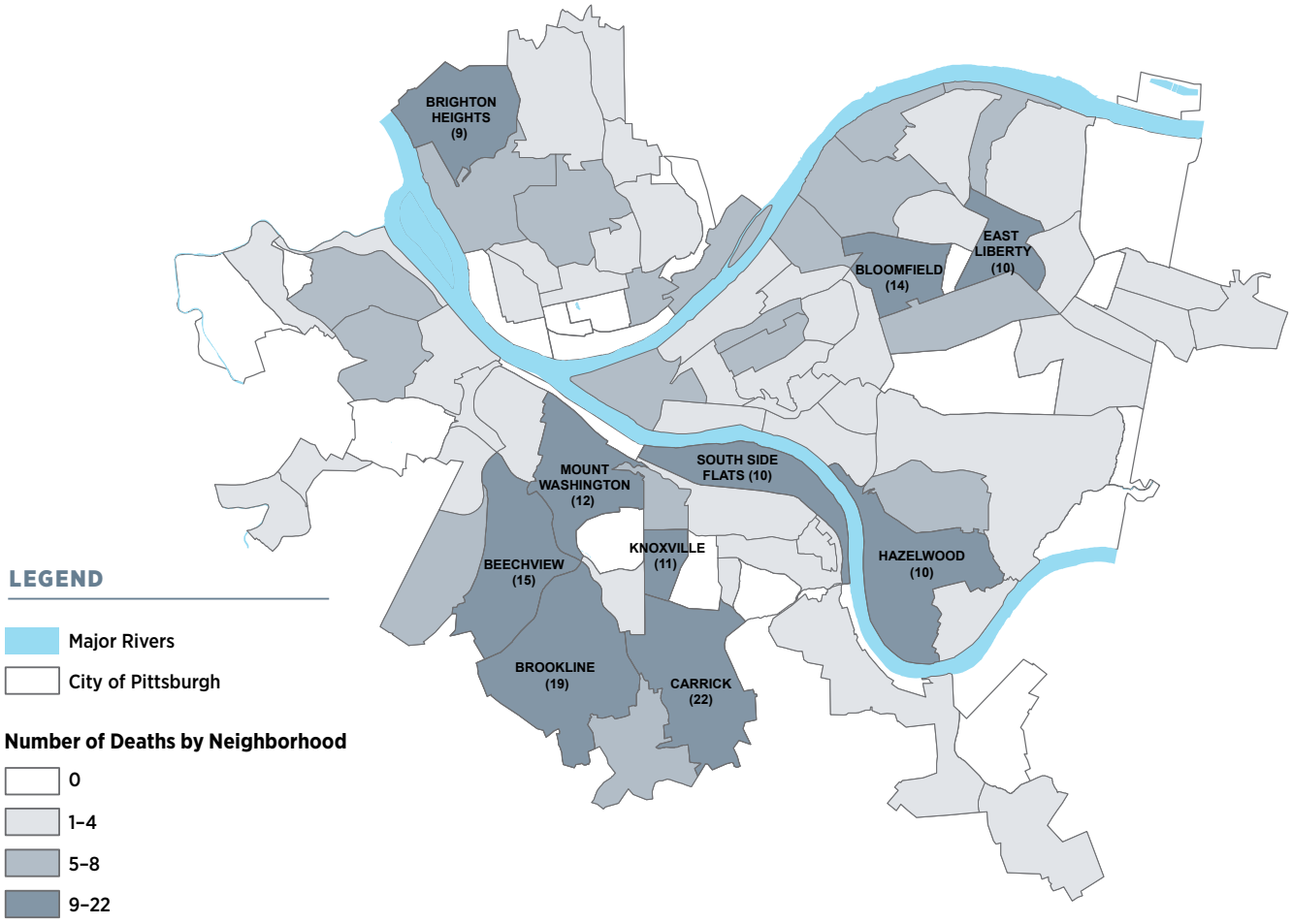
TABLE 4: **Fatal Opioid-Related Overdoses Ranked by Average Annual Death Rate by Municipality: 2015–2016 (n=910)**

MUNICIPALITY	NUMBER OF DEATHS 2015–16	POPULATION	AVERAGE ANNUAL DEATH RATE (PER 1,000)	RANK BY AVERAGE ANNUAL DEATH RATE
Millvale	12	3,740	1.60	1
Neville Township	3	1,088	1.38	2
Sharpsburg	9	3,436	1.31	3
McKees Rocks	15	6,088	1.23	4
Wilmerding	4	1,690	1.18	5
Harmar	7	2,991	1.17	6
North Braddock	10	4,847	1.03	7
Etna	7	3,446	1.02	8
Lincoln	2	1,000	1.00	9
McDonald	1	522	0.96	10

City of Pittsburgh Neighborhoods

The top ranked City of Pittsburgh neighborhoods by number of deaths and average annual death rate are listed in the figure and tables below.

FIGURE 6: **Opioid-Related Overdose Deaths by City of Pittsburgh Neighborhood: 2015–2016 (n=324)**



Neighborhoods with the highest deaths and death rates are listed in the tables below. Carrick, Brookline, Beechview, Bloomfield, and Mount Washington were the neighborhoods with the highest number of deaths.

TABLE 5: **Fatal Opioid-Related Overdoses Ranked by Number of Deaths in City of Pittsburgh Neighborhoods: 2015–2016 (n=324)**

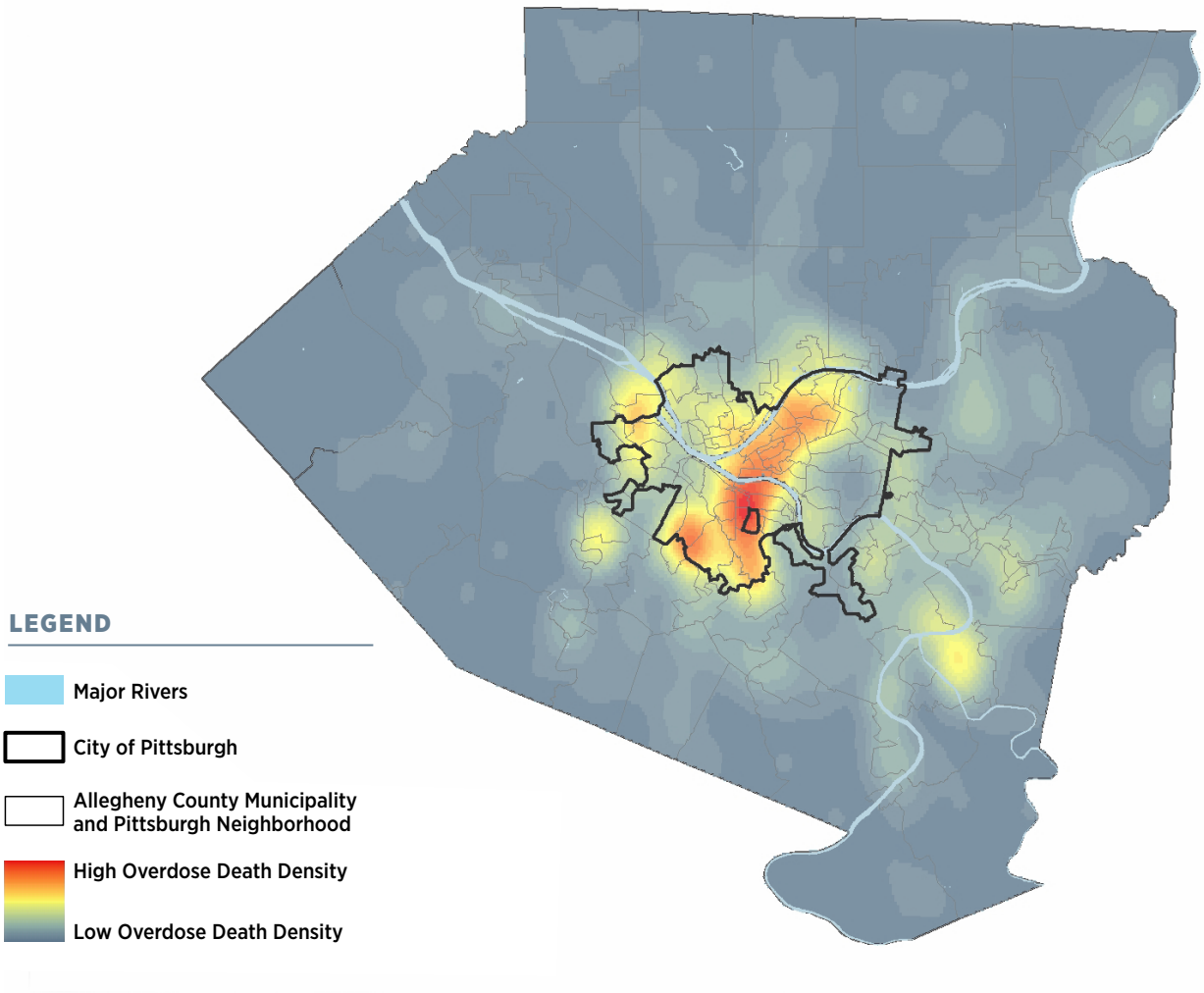
CITY NEIGHBORHOOD	NUMBER OF DEATHS 2015–16	POPULATION	AVERAGE ANNUAL DEATH RATE (PER 1,000)	RANK BY NUMBER OF DEATHS
Carrick	22	10,113	1.09	1
Brookline	19	13,214	0.72	2
Beechview	15	7,974	0.94	3
Bloomfield	14	8,442	0.83	4
Mount Washington	12	8,799	0.68	5
Knoxville	11	3,747	1.47	6
Hazelwood	10	4,317	1.16	7
East Liberty	10	5,869	0.85	7
South Side Flats	10	6,597	0.76	7
Brighton Heights	9	7,247	0.62	10
Pittsburgh Total	**324**	**306,045**	**0.53**	

TABLE 6: **Fatal Opioid-Related Overdoses Ranked by Death Rate by City of Pittsburgh Neighborhoods: 2015–2016 (n=324)**

NEIGHBORHOOD	NUMBER OF DEATHS	POPULATION	AVERAGE ANNUAL DEATH RATE (PER 1,000)	DEATH RATE RANKING
Esplen	2	301	3.32	1
Middle Hill	8	1,707	2.34	2
Bedford Dwellings	5	1,202	2.08	3
Ridgemont	2	483	2.07	4
Arlington Heights	1	244	2.05	5
West End	1	254	1.97	6
East Allegheny	7	2,136	1.64	7
Allentown	8	2,500	1.60	8
Knoxville	11	3,747	1.47	9
Hays	1	362	1.38	10
Pittsburgh Total	**324**	**306,045**	**1.06**	

Figure 7 presents clusters of overdose deaths. Calculations are based on the number of points in a location, with larger numbers of clustered points resulting in areas displaying greater density (i.e., red) on the map.

FIGURE 7: **Heatmap of Opioid-Related Overdose Deaths: 2015–2016**



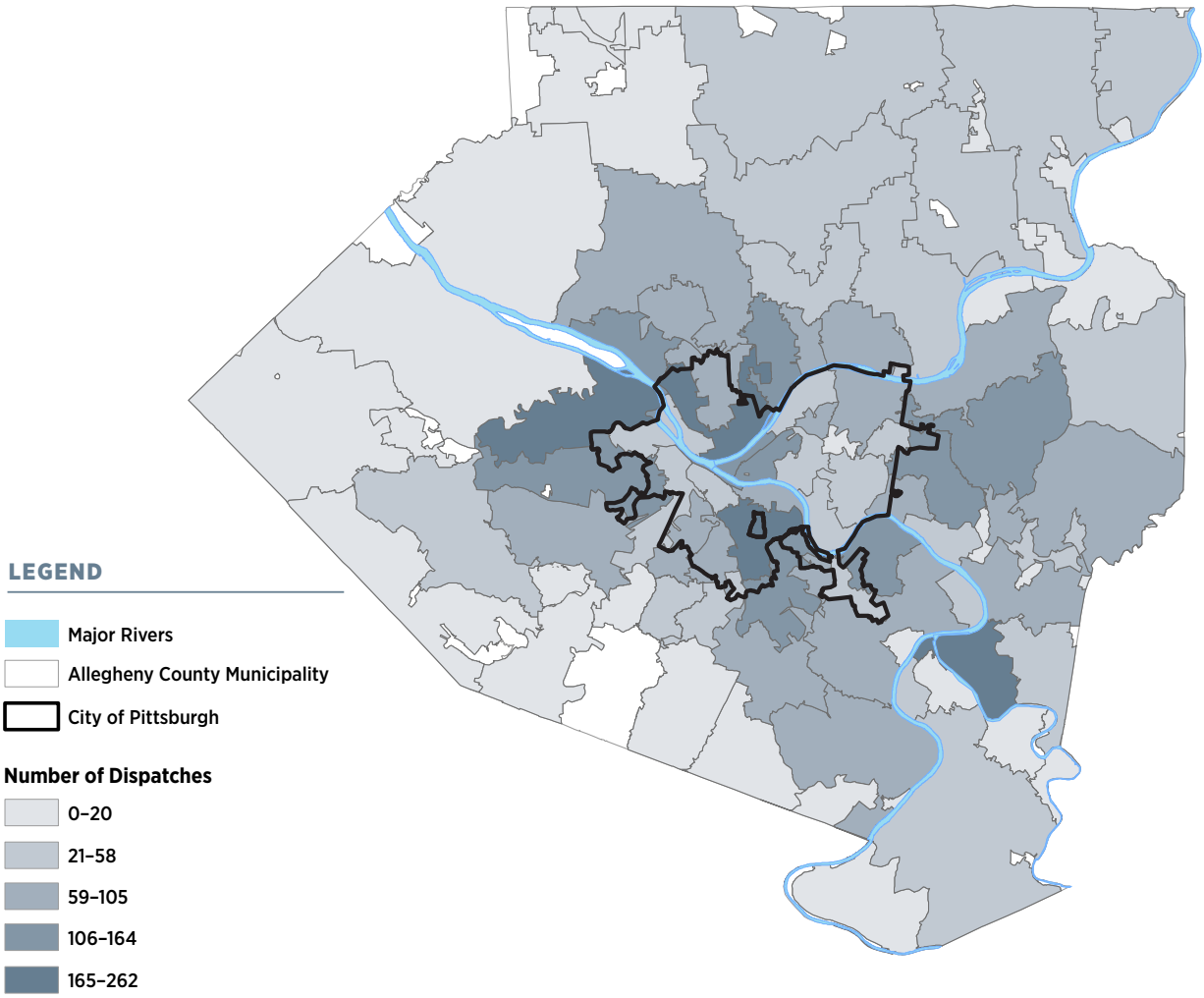
EMERGENCY RESPONSE LOCATION INFORMATION

In addition to assessing where overdose deaths occurred, this report also examines where emergency responders have administered naloxone, which hospitals people were admitted to with a chief complaint of overdose, and which police departments have known naloxone programs. We included this in our analysis to further inform intervention initiatives.

The areas with the greatest number of naloxone administrations included 15132 (area near McKeesport), 15236 (area near McKees Rocks), 15210 (area near Pittsburgh's southern neighborhoods), and 15212 (area near the Route 65–Route 28 corridor).

FIGURE 8: EMS Dispatches when Naloxone was Administered by ZIP Code in Allegheny County: 2015–2016[10]

[10]Data Source: Emergency Medical Service Institute of Pennsylvania (EMSI)



Emergency Department Admissions

The frequency of emergency department admissions can be used as a surveillance tool to understand where people present for overdose-related conditions. **Table 7** describes the number of admissions to local emergency departments with the chief complaint of overdose. While the large, urban hospitals (UPMC Mercy, UPMC Presbyterian, and Allegheny General) received the largest number of overdose-related admissions, other emergency departments received several admissions as well.

TABLE 7: Emergency Department Visits with Chief Complaint of Overdose by Hospital in Allegheny County: 2015–2016[11]

[11] Data source: EpiCenter

HOSPITALS IN ALLEGHENY COUNTY	COUNT
UPMC Mercy	2,107
UPMC Presbyterian	1,170
Allegheny General Hospital	1,105
Children's Hospital of Pittsburgh of UPMC	795
St. Clair Hospital	730
UPMC McKeesport	680
Forbes Hospital	553
Allegheny Valley Hospital	531
UPMC East	444
UPMC Passavant	382
UPMC Shadyside	355
Jefferson Hospital	333
UPMC St. Margaret	327
Ohio Valley Hospital	318
West Penn Hospital	214
Magee-Womens Hospital	151
Heritage Valley Sewickley	58

Naloxone Programs

An effective intervention to reduce fatal overdoses that is increasingly used nationally is for police officers, often first responders, to carry naloxone to an opioid-related overdose event. At the time of the prior overdose report published in 2016, there were 10 municipal police departments with known naloxone programs.

The Pennsylvania Department of Health (PA DOH) has assembled a comprehensive list of municipal police departments throughout the Commonwealth with and without known naloxone programs. As of June 2017, there were 68 departments in Allegheny County with known naloxone programs and 37 departments that did not have known naloxone programs.

PA DOH has also collected data on several known overdose reversals with the increased dissemination of naloxone among municipal and state police officers within the County. As of November 2017, there were 618 known overdose reversals resulting from police efforts.[12]

[12] Data source is Pennsylvania Department of Drug and Alcohol Programs (DDAP). http://www.ddap.pa.gov/overdose/Documents/County%20Map%20of%20Known%20Naloxone%20Reversals.pdf

HEALTH AND HUMAN SERVICES INVOLVEMENT IN THE YEAR PRIOR TO DEATH

The Data Warehouse was used to examine past encounters with public systems among people who overdosed. In the year prior to the death of these 910 individuals:

- 164 (18%) had been released from jail
- 388 (43%) had received a publicly funded behavioral health service
  - 257 (28%) had received a substance use disorder service
  - 313 (34%) had received a mental health service
  - 182 (20%) had received both a mental health (MH) and a substance use disorder (SUD) service
- 27 (3%) were listed as a parent on an open child welfare case[13]
  - There was a total of 87 children who were potentially affected by the person's death
    - 68 children were under 18 at the time of the death
    - 19 children were 18 or older at the time of the death
- 45 (5%) had some contact with homeless and housing services

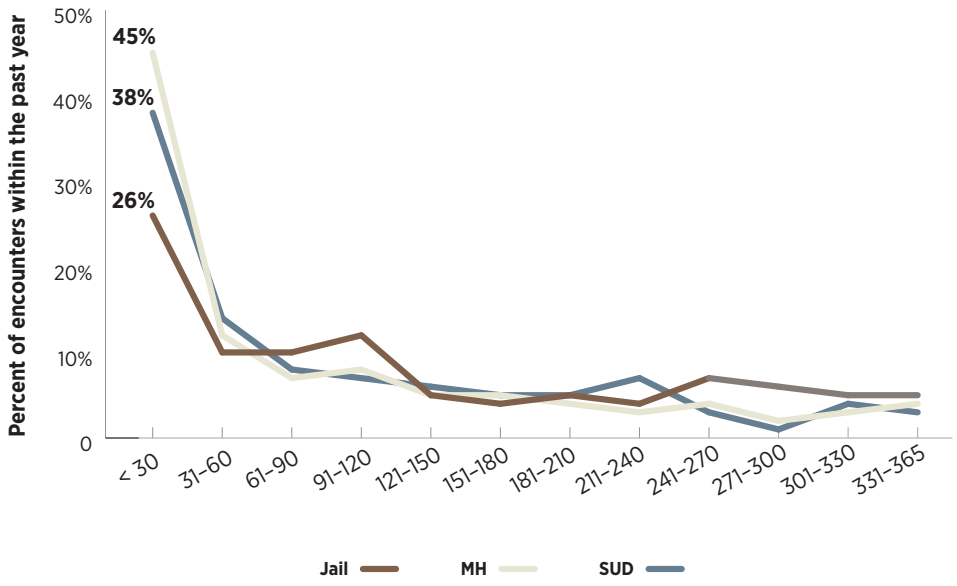
While these deaths represent a small portion of the people who had been booked in the Allegheny County Jail (14,387 in 2016) each year or interacted with those who were served by the publicly funded mental health (64,361 in 2016) or substance use disorder treatment system (14,091 in 2016) each year, a substantial proportion of the people dying of opioid-related drug overdoses have encountered one or more of these systems in the year prior to their death. We repeated an analysis we had performed for the prior reporting period (2008–2014) describing the time (in days) between a person's jail release or last publicly funded behavioral health service encounter within the year prior to the overdose death to identify where there may be opportunities for intervention (see **Table 8** and **Figure 9** below).

[13] The resulting list were children active with child welfare at some point in their lives, or currently active, whose parent, or the parent of a sibling, was listed as involved in an open child welfare case within a year of their death. Parent involvement was calculated based on their involvement start and end dates as recorded in child welfare records. The parent involvement was restricted to within one year of the parent's death. Children were counted by selecting any child that was actively involved in the case for which our parent was currently active. No time limit on the child's involvement was included as a restriction.

TABLE 8: **Time (In Days) Between Last Public System Encounter and Fatal Overdose: 2015–2016**

	JAIL		MH		SUD	
<30	43	26%	140	45%	97	38%
31–60	17	10%	37	12%	36	14%
61–90	17	10%	21	7%	21	8%
91–120	20	12%	25	8%	17	7%
121–150	8	5%	16	5%	16	6%
151–180	6	4%	15	5%	12	5%
181–210	9	5%	11	4%	13	5%
211–240	6	4%	10	3%	17	7%
241–270	11	7%	12	4%	8	3%
271–300	10	6%	7	2%	3	1%
301–330	8	5%	8	3%	9	4%
331–365	9	5%	11	4%	8	3%
Total	**164**		**313**		**257**	

FIGURE 9: **Time Between Overdose Death and Jail Release or Most Recent MH and SUD Encounter Among Those with Past Year Encounters: 2015–2016**



Allegheny County Jail

Forty-nine percent (448 of 910) of those who died of an opioid-related overdose had been incarcerated in ACJ at some point in the past, compared to 38 percent in the prior period (2008–2014).

Eighteen percent (164 of 910) of people had an incarceration and release from jail in the year prior to death compared to 15 percent during the previous reporting period. As in the prior reporting period, the largest number of overdose deaths (43 of 164, or 26%) occurred during the first 30-day period following jail release, and approximately half (77 of 164, or 47%) occurred during the first 90 days.

Mental Health (MH) Services

Thirty-four percent (313 of 910) had received a mental health service in the year prior to their death. This is comparable to the 36 percent during the previous period. Opioid-related fatalities occurred most frequently (45%, or 140 of 313) within 30 days of a recent mental health service. This is unchanged from the previous period.

The most common mental health services a person received in the 30 days prior to a fatal overdose were outpatient, targeted case management, crisis intervention, inpatient psychiatric, and transitional and community integration services.

TABLE 9: **Top Five Mental Health Services Received 30 Days Prior to Death (n=140)**

SERVICE TYPE	# PEOPLE
Outpatient	99
Targeted Case Management	20
Mental Health Crisis Intervention	16
Psychiatric Hospital Inpatient	16
Transitional and Community Integration Services	14

Substance Use Disorder (SUD) Services

Twenty-eight percent of those who died of an opioid overdose (257 of 910) had received a SUD service in the year prior to death. This is comparable to the 25 percent during the previous period of study. As in the previous period, opiate-related fatalities occurred most frequently (38%, or 97 of 257) within 30 days of a recent SUD treatment service.

The most common substance use disorder services a person received in the 30 days prior to a fatal overdose were outpatient, methadone maintenance, non-hospital rehabilitation (commonly known as "rehab"), non-hospital detoxification (commonly known as "detox")[14] and intensive outpatient.

[14] This level of care is usually delivered prior to "rehab."

TABLE 10: **Top Five Substance Use Disorder Services Received 30 Days Prior to Death (n=97)**

SERVICE TYPE	# PEOPLE
Outpatient	35
Methadone Maintenance	25
Non-Hospital Rehabilitation (Short- and Long-Term)	25
Non-Hospital Detoxification	18
Intensive Outpatient	11

Prescribed Medications Filled by HealthChoices Members Prior to Overdose

Just over half of the opioid-related deaths (463, or 51%) involved individuals who were actively enrolled HealthChoices members (i.e., insured through Medicaid) 90 days prior to their death. This was an increase from 45 percent during the previous period. Of these members, 309 filled one or more prescriptions 90 days prior to their death, some of which have dangerous combination or interaction effects with concurrent opioid use that further depress respiration and increase sedation, increasing the risk of overdose.[15] Nearly one-quarter (23%, or 102 of 463) filled a prescription for an opioid analgesic.[16] Nearly one-quarter (22%, or 103 of 463) filled a prescription for a benzodiazepine prescribed as an anti-anxiety, anti-convulsant or sedative. Additionally, nearly half (45%, or 207 of 463) filled a prescription for a psychotherapeutic medication normally used to treat a co-occurring mental disorder; 181 of these were related to an antidepressant medication.

[15] Sun, E.C.; Dixit, A.; Humphreys; K., Darnall, B.D;, Baker, L.C.; and Redlich, S.M. (2017). Association between concurrent use of prescription opioids and benzodiazepines and overdose: retrospective analysis. *British Medical Journal*, 356 (j760). Available online: http://www.bmj.com/content/356/bmj.j760

[16] Includes narcotic analgesics. Does not include other drug categories such as narcotic antitussives or narcotic withdrawal therapy agents.

TABLE 11: **Prescribed Medications Filled within 90 Days of Fatal Overdose: 2015–2016**

TYPE OF MEDICATION	# PEOPLE WHO FILLED RX	% OF HEALTHCHOICES MEMBERS IN THE OVERDOSE COHORT
Opioid Analgesics, Narcotics	102	23%
Psychotherapeutic Medications	223	48%
Benzodiazepines	103	22%

Homelessness and Housing

There were 45 (5%) individuals who had some encounter with the homelessness and housing services system in the past year and, of these, 10 (1%) had an encounter within 30 days prior to their death. While the deaths among people who were involved with this system represented a small proportion of overdose deaths overall, the highest number of deaths among clients in this system occurred among those who had visited an emergency shelter at some point in the past year.

TABLE 12: Homelessness and Housing Services Encounters in the Year and 30 Days Prior to Fatal Overdose: 2015–2016

	PAST YEAR	PAST 30 DAYS
Emergency Shelter	18	3
Transitional Housing	13	4
Day Shelter	8	1
Permanent Supportive Housing	8	5
Rapid Re-Housing	4	
Case Management	1	
Distinct Count	45	10

DISCUSSION AND RECOMMENDATIONS

Allegheny County is experiencing age-adjusted opioid overdose rates multiple times higher than in Pennsylvania and in the U.S. The growing presence of fentanyl and its analogues has certainly increased the lethality of illicit opioids locally and contributed to changes in the epidemic locally. The ACOME may also be more accurately reporting on the role of opioids, including fentanyl and its analogues, in causes of death that are listed on death certificates. Recent peer-reviewed literature and the Centers for Disease Control (CDC) suggest underreporting of opioid-related overdose fatalities throughout the country. This may be the result of coroners lacking accurate toxicology information upon the date of issuing death certificates or omitting opioid toxicity on death certificates when an infectious disease was present, among other reasons.[17,18] Additionally, homicide and suicide rates in Allegheny County are also frequently higher than state and national averages.[19]

A complexity of factors contributes to opioid-related overdose deaths in the County, some of which will not be addressed with interventions alone. Allegheny County agencies and community stakeholders continue to work together to monitor overdoses and coordinate targeted and effective intervention strategies. The changing dynamics of the epidemic demand that we continue to monitor trends closely, adapt our responses to people and places at potential increased risk, and consider other harm-reduction strategies to reduce the number of deaths. In this section, we focus on the interventions informed by our findings that are either new in this report or carry over from the previous reporting period.

Consider interventions that are targeted toward specific populations.

During this period, those who were maturing into the 25–34-year-old age cohort accounted for the largest age group of those dying. Improved analysis also highlighted that black males aged 45 years and older may represent a different or second epidemic occurring among those who use drugs long term who may now be affected by the increasing presence of fentanyl in street

[17] Ruhm, C.J. (2017, in press). Geographic variation in opioid and heroin involved drug poisoning mortality rates. *American Journal of Preventative Medicine*. Available online: http://www.ajpmonline.org/article/S0749-3797(17)30313-6/pdf

[18] Dispatches from the front lines: CDC's disease detective conference: https://www.cdc.gov/media/releases/2017/p0424-dispatches.html

[19] Homicides in Allegheny County and the City of Pittsburgh, 2010–2015. Available online: https://www.alleghenycountyanalytics.us/index.php/2017/10/10/homicides-allegheny-county-city-pittsburgh-2010-2015/ and Suicides in Allegheny County, 2002–2014. Available online: https://www.alleghenycountyanalytics.us/index.php/2016/02/01/suicide-in-allegheny-county-2002-through-2014/

heroin; fentanyl was a contributing factor in 83 percent of these deaths. Drug purchasing, drug-using practices, and risk-taking tolerance may be different between these two populations. Therefore, outreach and overdose prevention efforts demand considering approaches that are targeted toward these specific populations.

Improve screening for opioid use and overdose risk, overdose education, and naloxone distribution among individuals in mental health treatment.

There continues to be an opportunity for overdose prevention among community-based mental health treatment providers. Almost one-third of all deaths in the County had an encounter with mental health services that were paid for by HealthChoices (Medicaid) or the County (DHS) within a year of their death. Almost half of the HealthChoices members who died had filled a prescription for one or more psychotherapeutic medications within 90 days of their death. Additionally, it is unknown how many individuals who were treated for mental illness were effectively screened and treated for concurrent substance use, especially opioids.

The relatively high prevalence of co-occurring mental and substance use disorders in the U.S. population also emphasizes the importance of addressing substance use as a routine part of mental health treatment. According to the results of the most recent National Survey on Drug Use and Health,[20] about 18.5 percent of the U.S. adult population with a mental illness (8.2 of 44.7 million) met the criteria for an SUD in the past year and 43.3 percent (8.2 of 19.0 million) with an SUD met the criteria for mental illness in the past year. Among adults in specialty SUD or mental health treatment, past estimates had observed even higher rates; 20–50 percent of people in mental health treatment reported a lifetime co-occurring SUD and over 70 percent in SUD treatment reported a lifetime co-occurring mental illness.[21]

Improve identification of opioid use and overdose risk among the growing number of HealthChoices (i.e., Medicaid) members.

Medicaid expansion was implemented in Pennsylvania during this period, and there was an increasing number of people who became insured through HealthChoices. Not surprisingly, there was an increase in the proportion of the people who died who were actively enrolled HealthChoices members within 90 days of their death (45% during the prior period and 51% during this period). Additionally, 23 percent of the HealthChoices members who died had filled at least one prescription for a narcotic analgesic (i.e., pain killer) within 90 days of their death.

There is an increasing opportunity to identify HealthChoices members who are at risk of overdose and to connect their utilization across emergency rooms and doctors' offices, especially since the largest increase in service utilization among these new members was in behavioral health treatment. Managed care organizations and behavioral health providers could focus their efforts on identifying at-risk members, especially those who are newly insured and seeking specialty treatment. This could happen when the member first enrolls or when the member first seeks services. This could also happen when the member seeks specific medical services (e.g., surgery) or seeks treatment, to target for preventive care options and overdose prevention education.

[20] Substance Abuse and Mental Health Services Administration. (2017). Key substance use and mental health indicators in the United States: Results from the 2016 National Survey on Drug Use and Health (HHS Publication No. SMA 17-5044, NSDUH Series H-52). Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. Retrieved from https://www.samhsa.gov/data/

[21] Center for Substance Abuse Treatment. The Epidemiology of Co-Occurring Substance Use and Mental Disorders. COCE Overview Paper 8. DHHS Publication No. (SMA) 07-4308. Rockville, MD: Substance Abuse and Mental Health Services Administration, and Center for Mental Health Services, 2007.

Improve targeted interventions to County jail inmates at risk of overdose following release. Among potentially effective interventions that can be targeted toward inmates at risk of overdose following release include overdose prevention (including naloxone distribution) and initiating all types of medication-assisted treatment (MAT) while incarcerated. In October 2016, Allegheny County Jail (ACJ) began distributing naloxone kits to inmates upon release. Through the end of the first year (October 2017), ACJ has distributed more than 1100 naloxone kits.

At the time of this report, ACJ's offering of MAT is limited to women who are pregnant and receive methadone maintenance treatment. Additionally, a pilot has recently begun to screen and assess inmates for SUD treatment needs and, for those clinically appropriate, to offer Vivitrol. In November 2017, this pilot program reported its first enrolled participants.

Focus overdose prevention efforts in the areas of the County where the deaths are occurring. Improved analysis for this reporting period allowed for a summarization of fatal overdose incidents by municipality and City of Pittsburgh neighborhood. Those with the highest number of deaths could be considered priority locations for delivering overdose prevention interventions. An interactive dashboard is also available for communities to monitor where overdose deaths are occurring throughout the County.[22]

[22] Visit www.alleghenycountyanalytics.us to view the Allegheny County Overdose Dashboard.

Reconsider the evidence base for current priority interventions. Prescription opioids were a contributing factor in 17 percent of overdose deaths and were the sole source of opioids contributing to deaths in only 9 percent of the deaths during this period. While they continue to play a role, the primary contributing factors in recent deaths are heroin, and fentanyl and its analogues. The efforts to control prescribing practices and reduce the volume of prescription opioids are ongoing, but we would be remiss if this were the primary focus of our efforts. While it is important to reduce exposure to the improper use of these medications to prevent future addiction and overdoses, harm-reduction and other alternative overdose prevention strategies should also be considered to educate people who use substances on the lethality of fentanyl, its analogues and carfentanil, and empower them to reduce risks associated with illicit opioids, such as street heroin.

AUTHORS
Eric Hulsey, Dr.P.H., M.A., LuAnn Brink, Ph.D., M.P.H., Erin Dalton, Karen Hacker, M.D., M.P.H.

ANALYSTS
Catherine Jensen, Yuan Li, Josh Lewis, Chrystal Alexander

REVIEWERS
Latika Davis-Jones, Ph.D., M.P.H., M.S.W., Mary Hawk, Dr.P.H., L.S.W., Christina F. Mair, Ph.D., Karl E. Williams, M.D.

EDITOR
Alexa Seretti

APPENDIX A

Data Limitations

There were limitations to the data sources and the analyses in this report. While these limitations did not compromise the integrity of the analyses themselves, they continue to present a challenge in understanding the complete set of factors associated with opiate-related overdose in the County.

Individual-Level Data

Even though a significant amount of information was gathered about individuals and their encounters with publicly funded services and systems, the information is limited to the data sources included in the DHS Data Warehouse. There may be additional factors that contributed to fatal overdose risk; however, these data were unavailable for this analysis. While 91 percent (825 of 910) of those who died during the two-year period had a record of an encounter at some point in the past with a service or system represented in the Allegheny County Data Warehouse, 85 (9%) did not have a record other than an autopsy report. Additionally, even among those for whom records were available, there were likely more factors that influenced overdose risk than those that were available to the County at the time of this report.

Healthcare Data

Healthcare-related analysis included only publicly funded behavioral health services (i.e., those paid for by DHS or the Medicaid-managed program, HealthChoices.) While these data are extensive, they are not necessarily descriptive of healthcare utilization patterns among all Allegheny County residents nor those who are insured by commercial insurance plans.

Additionally, this analysis is limited to those individuals for whom we have a record of prescription fills using the HealthChoices pharmacy file. To gather a broader perspective about those who may be at risk of overdose fatality in Allegheny County, further research in collaboration with commercial insurance providers in the region about prescription fills, emergency department admissions, and other health services utilization would be required. Additionally, the new Prescription Drug Monitoring Program (PDMP) managed by the Pennsylvania Department of Health could be a rich source of information about prescription opioid medication fills among County residents and potential at-risk populations. However, this information is not currently available to ACDHS or ACHD.