

Opioids and Prescription Drug Monitoring Program

Opioid Deaths

Deaths from drug overdose are an increasing public health burden in the U.S. In 2016, there were more than 63,600 drug overdose deaths in the U.S. Pennsylvania is amongst the top four states with the highest observed age-adjusted drug overdose death rates.

In Pennsylvania, according to the Analysis of Overdose Deaths in Pennsylvania, 2016 Report by the Drug Enforcement Agency Philadelphia Division and the University of Pittsburgh, 4,642 drug-related overdose deaths were reported by Pa. coroners and medical examiners, an increase of 37 percent from 2015. In 2016, approximately 13 people died of drug-related overdose each day in Pa. The presence of a prescription or illicit opioid was identified in 85 percent of the overdose deaths. Fentanyl and fentanyl-related substances were the most frequently identified in decedents (52 percent of deaths), a significant increase from 2015 when fentanyl and fentanyl-related substances 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 and fentanyl-related substances. The Pennsylvania drug-related overdose death rate in 2016 was 36.5 per 100,000 people, an increase from 26.7 per 100,000 in 2015.¹ The national drug overdose death rate in 2015 was 16.3 per 100,000.²

The prescription opioid and heroin overdose epidemic is the worst public health crisis in Pennsylvania. It affects Pennsylvanians across the state, from big cities to rural communities. The Pennsylvania Department of Health is committed to being part of the solution by working with Governor Wolf to provide the Prescription Drug Monitoring Program (PDMP), the Standing Order (prescription) for naloxone, education about Narcan programs in schools, warm hand-off processes to facilitate referral for substance use disorder patients to treatment, prescribing and dispensing guidelines, and continuing education for health care providers.

Prescription Drug Monitoring Program (PDMP)

In past years, Pennsylvania's Prescription Drug Monitoring Program (PDMP), which required reporting of Schedule II controlled substances, was operated by the Office of the Attorney General (OAG). On October 27, 2014, the general Assembly of the Commonwealth of Pennsylvania passed the Achieving Better Care by Monitoring All Prescriptions Program (ABC-MAP), Act 191 of 2014, which requires the reporting of Schedule II through Schedule V controlled substances. The Pennsylvania Department of Health's PDMP Office is responsible for the development and the day-to-day operations of the new system. The purpose of the PDMP established by Act 191 of 2014 is twofold:

- To be used as a tool to increase the quality of patient care by giving prescribers and dispensers access to a patient's controlled substance prescription medication history, which will alert medical professionals to potential dangers for purposes of making treatment determinations; and
- To aid regulatory and law enforcement agencies in the detection and prevention of fraud, drug abuse and the criminal diversion of controlled substances.

The new PDMP system began accepting prescription dispensation data of Schedule II-V controlled substances on June 24, 2016, and was available for query by prescribers, dispensers and their delegates on Aug. 25, 2016. The PDMP office is governed by the Achieving Better Care by Monitoring All Prescriptions (ABC-MAP) board, which consists of the Secretaries of Health, Human Services, Drug and Alcohol Programs, State, Aging, the Insurance Commissioner, the State Police Commissioner, the Attorney General, and the Physician General.

Enhanced State Opioid Overdose Surveillance and Emergency Departments

Emergency department (ED) data, on visits related to drug overdose, is collected as part of the work being done in relation to the Enhanced State Opioid Overdose Surveillance (ESOOS) grant which funded by the Centers for Disease Control and Prevention (CDC). Figures 11.1 through 11.5 show statewide trends in ED visits related to overdoses as of November 2017, including rates broken down by age and gender.³ While few (<2 percent) records for ED overdose visits are missing patient age, a very small proportion of ED visits related to any cause (~0.3 percent) are missing patient age. This causes the percent of visits in the missing age category to look higher than the other age groups, but this is strictly related to the much smaller denominator.

Additional work related to the ESOOS grant that is not yet available for this report includes collection of Emergency Medical Services (EMS) data related to the provider's primary impression of a poisoning/drug ingestion with and without naloxone administration. Data for 2017 is not available due to an upgrade for the Bureau of Emergency Medical Services' software system. All EMS agencies in the commonwealth have until Dec. 31, 2017, to become compliant with the new software. This data will be available beginning early 2018.

The third component of the ESOOS grant relates to fatal opioid overdose data. The Pennsylvania Department of Health is currently working with coroners and medical examiners to gain additional information related to suspected opioid overdose deaths. This additional information, such as drugs present on toxicology screenings and risk factors related to fatal overdose, is being linked to Pennsylvania Death Certificate data. Results from this unique dataset will, in turn, be shared with stakeholders to develop and/or improve existing prevention and intervention efforts.

Figure 11.1 Percent of Emergency Department Visits Related to Suspected Overdose of Any Drug, Suspected Overdose of Any Opioid, and Suspected Overdose of Heroin*

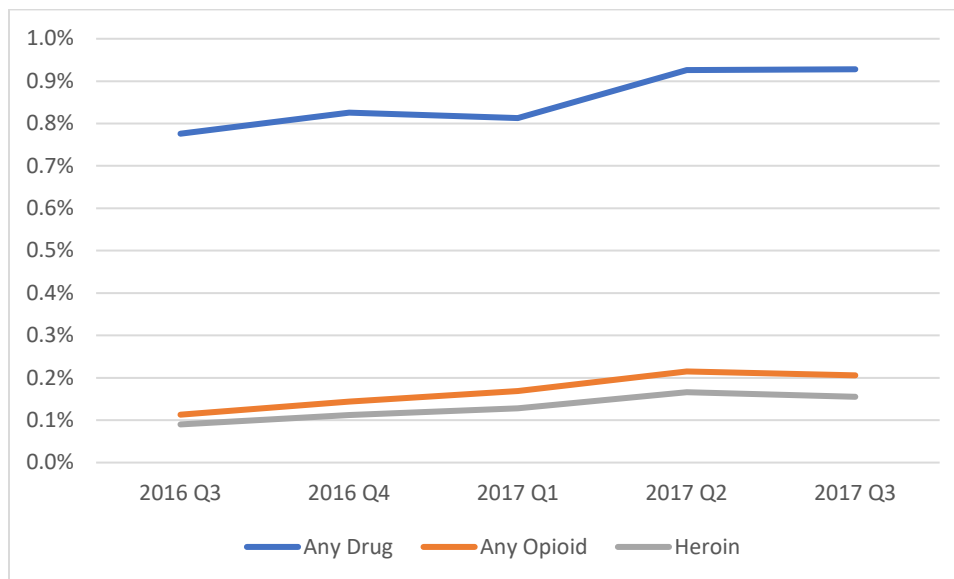


Figure 11.2 Percent of Emergency Department Visits Related to Suspected Overdose of Any Drug* by Age

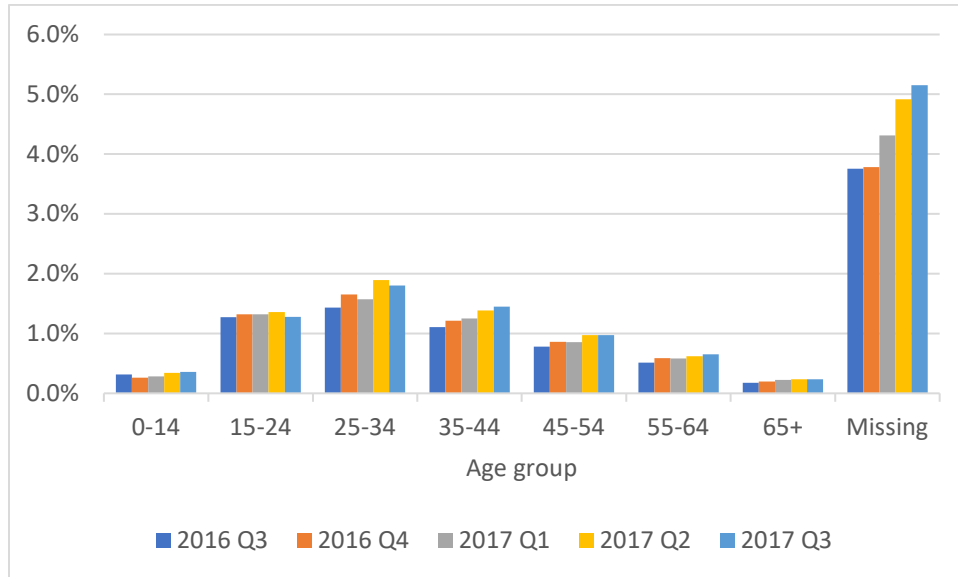


Figure 11.3 Percent of Emergency Department Visits Related to Suspected Overdose of Any Opioid* by Age

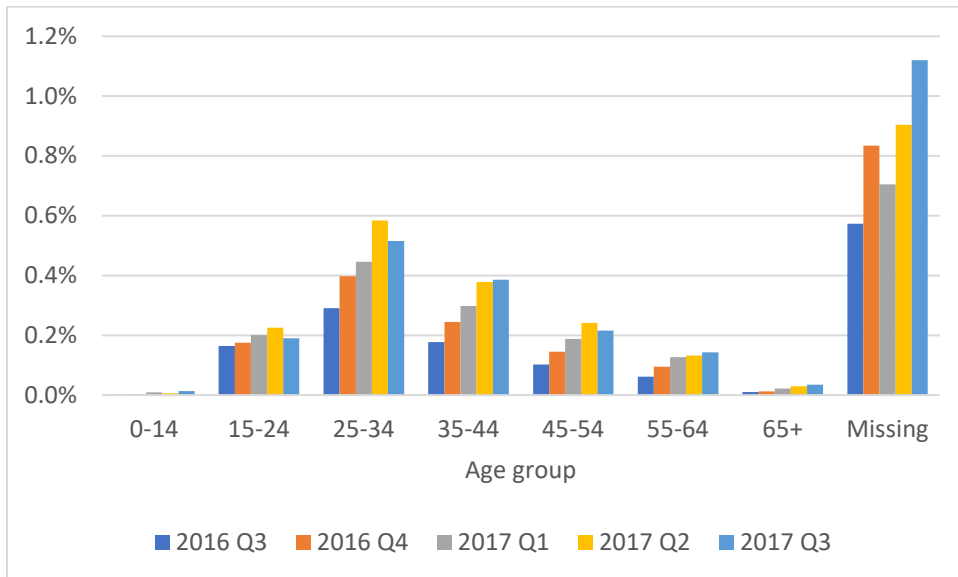


Figure 11.4 Percent of Emergency Department Visits Related to Suspected Overdose of Heroin* by Age

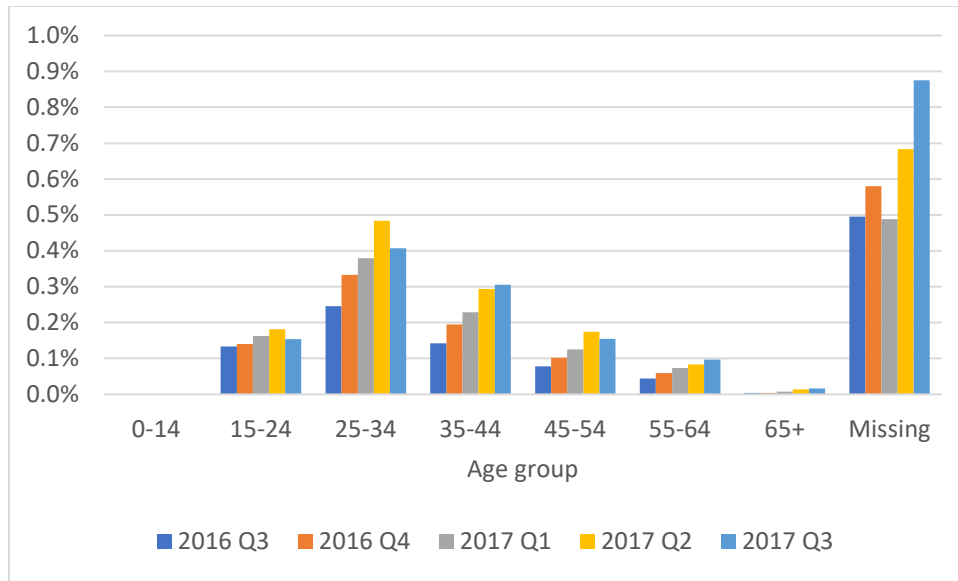
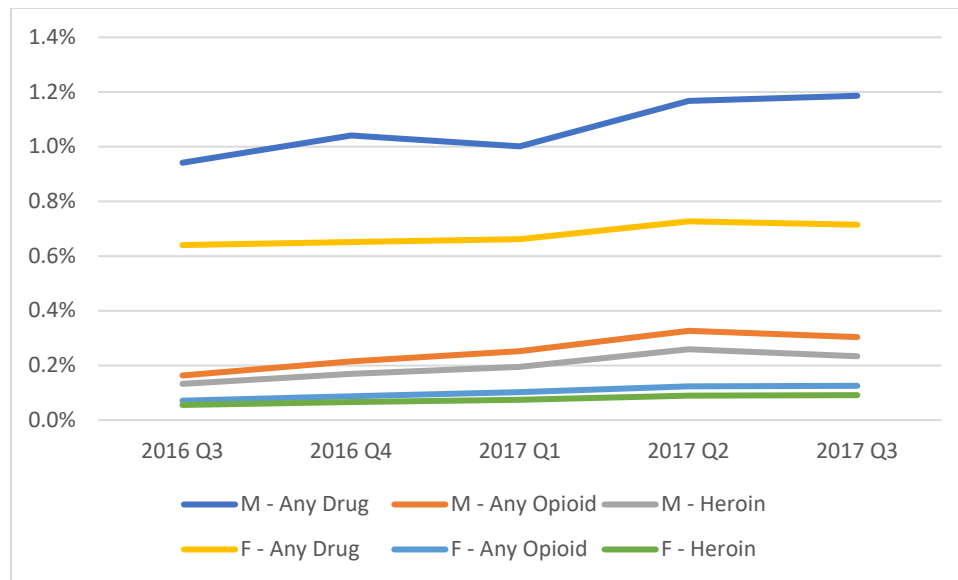


Figure 11.5 Percent of Emergency Department Visits Related to Suspected Overdose of Any Drug, Any Opioid, or Heroin* by Gender



*Any drug means all types of substances, including alcohol, over the counter medication, prescription and illicit drugs. *Any opioid means all types of opioids, including prescription and illicit drugs, as well as heroin. Heroin means all suspected heroin overdoses. Results may or may not be based on toxicology depending on facility practices.

An emergency department visit is classified as a "Suspected Overdose of Any Drug," "Suspected Overdose of Any Opioid," or "Suspected Overdose of Heroin" based on the pre-diagnostic chief complaint, as well as the pre-diagnostic chief complaint in combination with diagnostic codes and medical notes text, when available. Currently, many facilities do not submit diagnostic codes or medical notes into Pennsylvania's syndromic surveillance system, EpiCenter. The lack of diagnostic codes and medical notes, as well as a high volume of non-specific chief complaints (do not mention substance involved in the overdose) leads to an underestimation of "Suspected Overdose Any Opioid" and "Suspected Overdose of Heroin." Chief complaint fields are also subject to a variety of limitations related to the language used to describe the complaint⁴ and are subject to variation at the facility and the individual health care worker level. The Department of Health

will work with its syndromic surveillance vendor in 2018 to increase the number of facilities reporting (currently 89 percent) and the number of facilities submitting diagnostic codes and medical notes data to improve the accuracy of the “Any Opioid and Heroin” overdose estimates.

Table 11.1 Percent of Emergency Department Visits Related to Suspected Overdose of Any Drug, Including Alcohol, Over the Counter Medications, Prescription and Illicit Drugs, Based on Location of the Emergency Department⁵

County	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3
Adams County	0.56	0.55	0.41	0.54	0.40
Allegheny County	0.92	0.99	0.99	1.04	1.02
Armstrong County	0.66	1.05	0.38	0.77	0.44
Beaver County	ND	0.08	0.07	0.09	0.41
Bedford County	0.27	0.56	0.75	0.66	0.67
Berks County	0.90	0.68	0.70	0.86	0.83
Blair County	0.53	0.62	0.73	0.70	0.69
Bradford County	0.37	0.29	0.38	0.30	0.24
Bucks County	0.77	0.93	0.91	1.08	0.92
Butler County	0.72	0.66	0.70	0.58	0.67
Cambria County	1.31	1.30	1.02	0.89	0.67
Cameron County*	NE	NE	NE	NE	NE
Carbon County	1.34	0.94	0.95	1.28	1.46
Centre County	2.06	1.79	1.77	1.26	2.16
Chester County†	0.50	0.67	0.68	0.61	0.58
Clarion County	0.37	0.57	0.53	0.48	0.36
Clearfield County†	0.39	0.45	0.44	0.72	0.50
Clinton County†	1.14	0.00	0.00	ND	ND
Columbia County†	0.62	0.76	0.63	0.66	0.40
Crawford County	0.53	0.93	0.77	0.58	0.54
Cumberland County	1.00	0.77	0.72	0.90	0.81
Dauphin County	0.89	0.72	0.83	0.92	0.78
Delaware County	1.08	1.23	1.19	1.45	1.42
Elk County	0.50	0.60	0.67	0.32	0.48
Erie County†	0.66	0.91	0.85	0.80	0.80
Fayette County	0.78	0.54	0.79	0.97	1.05
Forest County*	NE	NE	NE	NE	NE
Franklin County	0.73	0.73	0.61	0.66	0.74
Fulton County	1.07	0.48	0.36	1.05	0.76
Greene County	0.43	0.17	0.17	0.44	0.62
Huntingdon County	0.91	0.77	0.67	0.48	1.19
Indiana County	0.43	0.72	0.76	0.60	0.66
Jefferson County†	0.57	0.19	0.31	0.18	0.43
Juniata County*	NE	NE	NE	NE	NE
Lackawanna County	0.80	0.71	0.79	0.88	0.85

County	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3
Lancaster County†	1.13	1.17	0.91	1.01	1.81
Lawrence County	0.97	0.95	1.09	0.88	0.59
Lebanon County	0.65	0.88	0.54	0.70	0.94
Lehigh County	0.76	0.81	0.76	0.91	0.74
Luzerne County	0.93	0.93	1.07	1.34	1.23
Lycoming County	0.66	0.69	0.38	0.80	0.77
McKean County	0.49	0.45	0.38	0.42	0.41
Mercer County	0.51	0.63	0.74	0.82	0.91
Mifflin County	0.42	0.42	0.38	0.33	0.60
Monroe County†	0.65	0.49	0.56	0.65	0.47
Montgomery County†	0.47	0.46	0.42	0.54	0.53
Montour County	0.57	0.60	0.48	0.49	0.44
Northampton County†	0.66	0.66	0.67	0.73	0.65
Northumberland County†	0.34	0.49	0.49	0.62	0.53
Perry County*	NE	NE	NE	NE	NE
Philadelphia County†	0.75	0.88	0.94	1.19	1.18
Pike County*	NE	NE	NE	NE	NE
Potter County†	NA	NA	NA	NA	NA
Schuylkill County	0.86	0.74	0.63	0.81	0.99
Snyder County*	NE	NE	NE	NE	NE
Somerset County	0.43	0.43	0.51	0.42	0.40
Sullivan County*	NE	NE	NE	NE	NE
Susquehanna County	0.63	0.30	0.60	0.45	0.30
Tioga County	0.34	0.48	0.63	0.73	0.73
Union County	0.46	0.58	0.50	0.62	0.68
Venango County	0.30	0.53	0.52	0.60	0.72
Warren County	0.33	0.46	0.35	0.27	0.27
Washington County	1.05	1.15	0.77	1.14	1.18
Wayne County	0.34	0.55	0.58	0.68	0.51
Westmoreland County	0.68	0.89	0.83	0.78	0.91
Wyoming County†	NA	NA	NA	NA	NA
York County†	1.05	1.06	0.99	1.15	1.08
State	0.78	0.83	0.81	0.93	0.93

* No Emergency Department located within county

NE = No events because no ED

ND = Not displayed due to count between 1 and 4

† < 100 percent emergency departments reporting

NA = Not applicable because no reporting EDs

Only Cambria County shows a consistently decreasing trend in Suspected Overdose of Any Drug during this timeframe.

Table 11.2 Percent of Emergency Department Visits Related to Suspected Overdose of Any Opioid, Including Prescription and Illicit Drugs, Based on Location of the Emergency Department

County	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3
Adams County	ND	0.14	ND	0.07	ND
Allegheny County	0.23	0.26	0.34	0.33	0.35

County	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3
Armstrong County	0.13	0.27	0.09	0.14	0.11
Beaver County	0.00	0.00	0.00	0.00	0.00
Bedford County	ND	ND	0.11	ND	ND
Berks County	0.18	0.12	0.13	0.18	0.17
Blair County	0.06	0.05	0.21	0.16	0.15
Bradford County	ND	0.00	ND	ND	0.00
Bucks County	0.07	0.11	0.12	0.15	0.09
Butler County	0.10	0.07	0.06	ND	ND
Cambria County	0.11	0.39	0.32	0.29	0.14
Cameron County*	NE	NE	NE	NE	NE
Carbon County	0.23	0.34	0.33	0.34	0.44
Centre County	0.03	0.05	0.05	ND	0.07
Chester County†	ND	0.07	0.14	0.12	0.10
Clarion County	ND	0.13	ND	ND	0.00
Clearfield County†	ND	ND	ND	ND	ND
Clinton County†	0.00	0.00	0.00	0.00	0.00
Columbia County†	0.10	ND	ND	0.09	ND
Crawford County	0.06	ND	0.09	ND	0.06
Cumberland County	0.13	0.12	0.11	0.20	0.18
Dauphin County	0.23	0.18	0.21	0.25	0.14
Delaware County	0.29	0.45	0.39	0.60	0.52
Elk County	ND	ND	ND	ND	0.00
Erie County†	0.04	0.07	0.20	0.22	0.19
Fayette County	0.14	0.08	0.23	0.26	0.38
Forest County*	NE	NE	NE	NE	NE
Franklin County	ND	ND	ND	ND	ND
Fulton County	ND	ND	ND	ND	ND
Greene County	ND	0.00	ND	ND	0.00
Huntingdon County	0.00	ND	0.00	0.00	0.00
Indiana County	0.06	0.07	0.07	0.05	0.14
Jefferson County†	ND	ND	ND	ND	ND
Juniata County*	NE	NE	NE	NE	NE
Lackawanna County	0.03	0.02	0.08	0.09	0.08
Lancaster County†	0.27	0.26	0.16	0.24	0.28
Lawrence County	0.07	0.11	0.06	0.16	0.35
Lebanon County	0.13	0.21	0.14	0.17	0.18
Lehigh County	0.07	0.08	0.07	0.07	0.09
Luzerne County	0.09	0.09	0.28	0.41	0.30
Lycoming County	ND	0.04	ND	0.00	0.03
McKean County	ND	ND	ND	0.00	0.00
Mercer County	0.14	0.14	0.25	0.33	0.33

County	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3
Mifflin County	ND	ND	ND	ND	ND
Monroe County†	0.11	0.07	0.10	0.06	ND
Montgomery County†	0.01	0.01	0.02	0.06	0.04
Montour County	ND	ND	ND	ND	ND
Northampton County†	0.08	0.10	0.09	0.13	0.19
Northumberland County†	ND	ND	ND	0.10	0.16
Perry County*	NE	NE	NE	NE	NE
Philadelphia County†	0.07	0.15	0.20	0.33	0.33
Pike County*	NE	NE	NE	NE	NE
Potter County†	NA	NA	NA	NA	NA
Schuylkill County	0.09	0.14	0.07	0.07	0.11
Snyder County*	NE	NE	NE	NE	NE
Somerset County	0.00	0.00	0.00	0.00	ND
Sullivan County*	NE	NE	NE	NE	NE
Susquehanna County	ND	ND	ND	ND	ND
Tioga County	0.00	0.00	0.00	0.00	0.00
Union County	0.07	0.10	ND	0.10	0.13
Venango County	ND	0.07	0.07	0.11	0.17
Warren County	0.00	ND	ND	0.00	ND
Washington County	0.29	0.39	0.25	0.25	0.32
Wayne County	ND	ND	ND	0.08	0.08
Westmoreland County	ND	ND	0.00	ND	ND
Wyoming County†	NA	NA	NA	NA	NA
York County†	0.18	0.16	0.15	0.17	0.15
State	0.11	0.14	0.17	0.22	0.21

* No emergency department located within county † <100 percent emergency departments reporting

NE = No events because no ED NA = Not applicable because no reporting EDs

ND = Not displayed due to count between 1 and 4

Only Butler County shows a consistently decreasing trend in Suspected Overdose of Any Opioid during this timeframe.

Table 11.3 Percent of Emergency Department Visits Related to Suspected Overdose of Heroin, Based on Location of the Emergency Department

County	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3
Adams County	ND	0.09	ND	ND	ND
Allegheny County	0.20	0.22	0.26	0.24	0.25
Armstrong County	0.12	0.15	ND	0.09	ND
Beaver County	0.00	0.00	0.00	0.00	0.00
Bedford County	ND	ND	ND	ND	0.00
Berks County	0.16	0.11	0.12	0.15	0.13
Blair County	0.04	ND	0.12	0.09	0.05
Bradford County	ND	0.00	ND	ND	0.00
Bucks County	0.07	0.09	0.11	0.13	0.07

County	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3
Butler County	0.10	0.07	0.05	ND	ND
Cambria County	0.10	0.33	0.24	0.25	0.14
Cameron County*	NE	NE	NE	NE	NE
Carbon County	0.17	0.31	0.30	0.24	0.38
Centre County	ND	0.04	ND	ND	0.06
Chester County†	ND	0.04	0.10	0.07	0.09
Clarion County	ND	ND	ND	ND	0.00
Clearfield County†	0.00	ND	ND	ND	ND
Clinton County†	0.00	0.00	0.00	0.00	0.00
Columbia County†	ND	ND	ND	ND	ND
Crawford County	0.05	ND	0.09	ND	ND
Cumberland County	0.11	0.09	0.07	0.16	0.15
Dauphin County	0.18	0.10	0.13	0.15	0.08
Delaware County	0.24	0.36	0.32	0.48	0.40
Elk County	0.00	0.00	ND	ND	0.00
Erie County†	0.03	0.06	0.13	0.16	0.12
Fayette County	0.14	0.06	0.17	0.18	0.27
Forest County*	NE	NE	NE	NE	NE
Franklin County	0.00	ND	ND	ND	ND
Fulton County	0.00	0.00	ND	ND	ND
Greene County	ND	0.00	ND	ND	0.00
Huntingdon County	0.00	0.00	0.00	0.00	0.00
Indiana County	0.05	0.07	0.07	0.05	0.13
Jefferson County†	0.00	ND	ND	0.00	ND
Juniata County*	NE	NE	NE	NE	NE
Lackawanna County	0.02	ND	0.04	0.05	0.05
Lancaster County†	0.18	0.20	0.12	0.17	0.22
Lawrence County	0.05	0.10	ND	0.10	ND
Lebanon County	0.11	0.17	0.11	0.15	0.17
Lehigh County	0.06	0.06	0.06	0.06	0.06
Luzerne County	0.06	0.06	0.20	0.31	0.24
Lycoming County	ND	0.03	0.00	0.00	0.03
McKean County	0.00	0.00	ND	0.00	0.00
Mercer County	0.10	0.11	0.15	0.23	0.21
Mifflin County	ND	0.00	0.00	ND	0.00
Monroe County†	0.10	0.07	0.10	0.06	ND
Montgomery County†	0.01	0.01	0.02	0.05	0.03
Montour County	ND	ND	ND	0.00	ND
Northampton County†	0.06	0.06	0.05	0.09	0.15
Northumberland County†	ND	ND	ND	ND	0.11
Perry County*	NE	NE	NE	NE	NE
Philadelphia County†	0.05	0.11	0.16	0.28	0.27

County	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3
Pike County*	NE	NE	NE	NE	NE
Potter County†	NA	NA	NA	NA	NA
Schuylkill County	0.07	0.10	0.04	0.03	0.07
Snyder County*	NE	NE	NE	NE	NE
Somerset County	0.00	0.00	0.00	0.00	ND
Sullivan County*	NE	NE	NE	NE	NE
Susquehanna County	0.00	ND	ND	ND	0.00
Tioga County	0.00	0.00	0.00	0.00	0.00
Union County	ND	0.09	ND	0.07	ND
Venango County	ND	ND	ND	ND	0.08
Warren County	0.00	ND	ND	0.00	0.00
Washington County	0.26	0.33	0.22	0.19	0.28
Wayne County	0.00	ND	0.00	ND	ND
Westmoreland County	ND	0.00	0.00	ND	ND
Wyoming County†	NA	NA	NA	NA	NA
York County†	0.13	0.11	0.10	0.11	0.10
State	0.09	0.11	0.13	0.17	0.16

* No emergency department located within county † <100 percent emergency departments reporting
 NE = No events because no ED NA = Not applicable because no reporting EDs
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Only Clarion and Columbia Counties show a consistently decreasing trend in Suspected Overdose of Heroin during this timeframe.

Prescription Drug Monitoring Program Interactive Data Report

The PDMP is in the process of developing an online data portal where aggregate ESOOS data and the PDMP system data, including the count and rate of Schedule II-V drugs dispensed in Pennsylvania, and rates of high risk prescribing patterns (overlapping opioid and benzodiazepine prescriptions, overlapping opioid prescriptions, patients receiving >90 daily morphine milligram equivalent doses) can be shared at the state and county level. This data can be accessed by stakeholders and used to target resources and implement data-driven intervention and prevention efforts. It can also be used to compare Pennsylvania data to other states with their own online data portals (e.g., Oregon⁶ and Wisconsin⁷) and data provided nationally, such as prescribing data published by the CDC.⁸ This report should be available by early 2018 and will be updated at least quarterly.

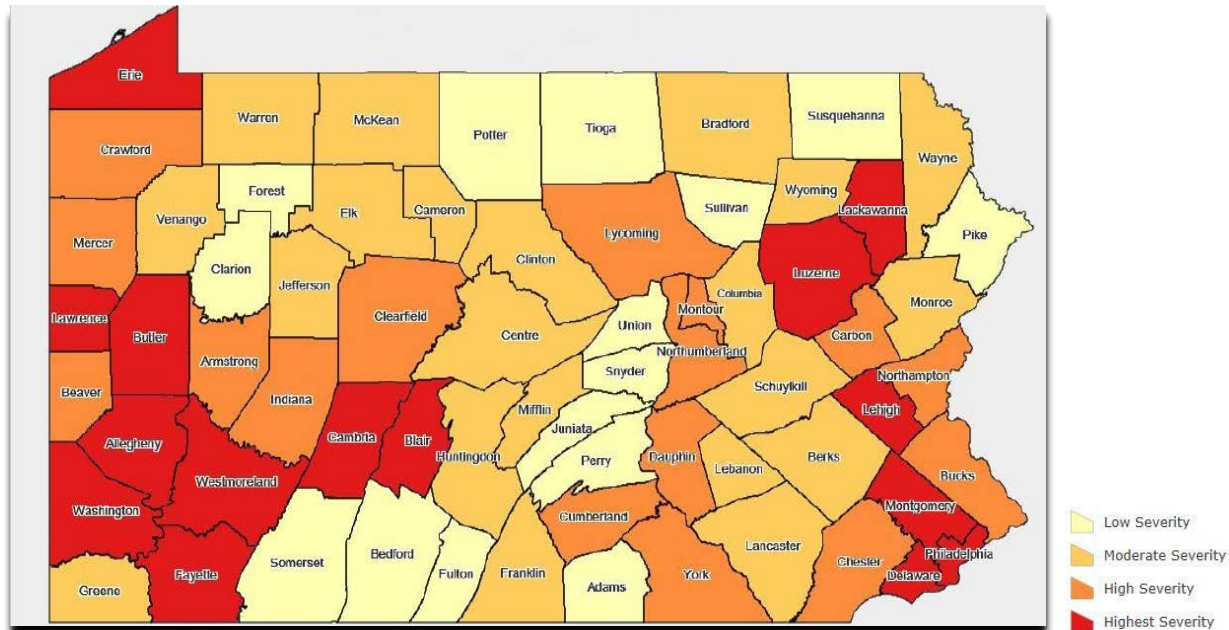
Prescription Drug Monitoring Program Integration with Electronic Health Record (EHR) and Pharmacy Management Systems (PMS)

The Pennsylvania Department of Health is integrating the Prescription Drug Monitoring Program (PDMP) system into electronic health records and pharmacy systems across the commonwealth. The goal is to minimize any workflow disruption by providing near-instant and seamless access to critical prescription history information to both prescribers and pharmacists. All health care entities in Pennsylvania legally authorized to prescribe, administer or dispense controlled substances are eligible to apply for integration. This includes ambulatory care units, acute care facilities, emergency care units, physician practices, pharmacies, drug treatment facilities and others. Since the PDMP has federal funding available for this initiative, the goal of the PDMP is to integrate with as many health care entities as possible by August 2019. The PA PDMP also meets the definition of Centers for Medicare and Medicaid Services (CMS) defined Meaningful Use (MU) Stage

2 specialized registry. Eligible professionals (EPs) and eligible hospitals (EHs) can meet the MU Stage 2 Specialized Registry objective by completing the requirements of successful ongoing submission of patient identifiers to the PDMP system and receipt of corresponding PDMP data using Certified Electronic Health Record Technology (CEHRT).

Prescription Drug Monitoring Program Education Plan

Figure 11.6 Counties Targeted for Prescription Drug Monitoring Program Education and Outreach Selected Based on the Analysis as Described in this figure



- Analysis of 1) 2015 OD deaths, 2) Total Schedule II-V dispensations from 7/1/2016 - 12/31/2016, 3) Total Schedule II-V prescriptions from 7/1/2016 - 12/31/2016, 4) Number of doctor shoppers (patients having prescriptions written by 5+ prescribers AND filling those prescriptions at 5+ dispensaries from 7/1/2016 - 12/31/2016)
- Sources: Pennsylvania PDMP, 2015 Pa. Coroner's Report, Pop. data: 2015 Population data from Pennsylvania State Data Center at Penn State Harrisburg
- Red = counties 1 - 15, Orange = counties 16 - 30, Yellow = counties 31 - 52, No Fill = counties 53 - 67
- OD death rate = $\text{Count OD deaths 2015} / \text{2015 county population} * 100,000$
- Dispensations rate = $\text{Count dispensations} / \text{2015 county population} * 100,000$
- Prescriptions rate = $\text{Count prescriptions} / \text{2015 county population} * 100,000$
- Doctor shoppers rate = $\text{Count doctor shoppers} / \text{2015 county population} * 100,000$

The Prescription Drug Monitoring Program used 2015 overdose data from the Pennsylvania Death Certificate Dataset, county population data, and various data points from the PDMP system, including Schedule II-V dispensations from July 1, 2016, through Dec. 31, 2016, based on the location of the dispenser, Schedule II-V dispensations from July 1, 2016, through Dec. 31, 2016, based on the location of the patient receiving the prescription, the number of doctor shoppers, defined as patients having prescriptions written by 5+ prescribers and filling those prescriptions at 5+ dispensaries between 7/1/2016 - 12/31/2016, to calculate a rank score for each county in the commonwealth in an effort to prioritize counties for education and outreach-related Pennsylvania opioid prescribing guidelines⁹ and how the PDMP system can be used to help improve prescribing practices in Pennsylvania. The counties in the highest severity category are being targeted first for this outreach and education effort, with the high, moderate and low categories targeted for subsequent waves of outreach.

Endnotes

- ¹ DEA Philadelphia Division and the University of Pittsburgh. (2017). *Analysis of Overdose Deaths in Pennsylvania, 2016*. Retrieved from https://www.dea.gov/docs/DEA-PHL-DIR-034_17_percent20Analysis_percent20of_percent20Overdose_percent20Deaths_percent20in_percent20Pennsylvania_percent202016.pdf
- ² Rudd RA, Seth P, David F, Scholl L. Increases in Drug and Opioid-Involved Overdose Deaths — United States, 2010–2015. *MMWR Morb. Mortal Wkly. Rep* 2016; 65:1445–1452. DOI: <http://dx.doi.org/10.15585/mmwr.mm655051e1>
- ³ The Pennsylvania Department of Health (2017). *Syndromic Surveillance*. Retrieved from http://www.health.pa.gov/Your-Department-of-Health/Offices_percent20and_percent20Bureaus/epidemiology/Pages/Syndromic-surveillance.aspx#.Wh1XBJQo4y8
- ⁴ A. Shapiro. Taming variability in free text: application to health surveillance. *MMWR Morb. Mortal Wkly. Rep*, 53 (2005), pp. 95-100. Retrieved from <https://www.cdc.gov/mmWR/preview/mmwrhtml/su5301a20.htm>
- ⁵ The Pennsylvania Department of Health (2017). *Syndromic Surveillance*. Retrieved from http://www.health.pa.gov/Your-Department-of-Health/Offices_percent20and_percent20Bureaus/epidemiology/Pages/Syndromic-surveillance.aspx#.Wh1XBJQo4y8
- ⁶ Oregon Health Authority (2017). Retrieved from <http://www.oregon.gov/oha/PH/PREVENTIONWELLNESS/SUBSTANCEUSE/OPIOIDS/Pages/data.aspx>
- ⁷ Wisconsin ePDMP (2017). *Wisconsin Enhanced Prescription Drug Monitoring Program Statistics Dashboard*. Retrieved from <https://pdmp.wi.gov/statistics>
- ⁸ Centers for Disease Control and Prevention (2017). *Prescribing Data*. Retrieved from <https://www.cdc.gov/drugoverdose/data/prescribing.html>
- ⁹ The Pennsylvania Department of Health (2017). *Opioid Prescribing Guidelines*. Retrieved http://www.health.pa.gov/my_percent20health/diseases_percent20and_percent20conditions/m-p/opioids/pages/prescribing-guidelines.aspx#.Wh1hqZQo4y8