



Maternal Hospital Stays involving Substance Use and Opioids

This research brief examines maternal hospital stays for Pennsylvania residents (age 12-55 years) where substance use (such as opioids, cannabis, cocaine, alcohol, etc.) was present and highlights, in particular, details about opioid use. Some opioid drugs may be prescribed as part of medication-assisted treatment to relieve withdrawal symptoms and psychological cravings often associated with opioid use disorders. Maternal stays include those involving a delivery, as well as other pregnancy-related stays, occurring in Pennsylvania general acute care hospitals between the two-year periods 2000-2001 and 2016-2017 (based on calendar years).

Maternal Stays involving Substance Use and Opioids

Substance use: 1 in 25

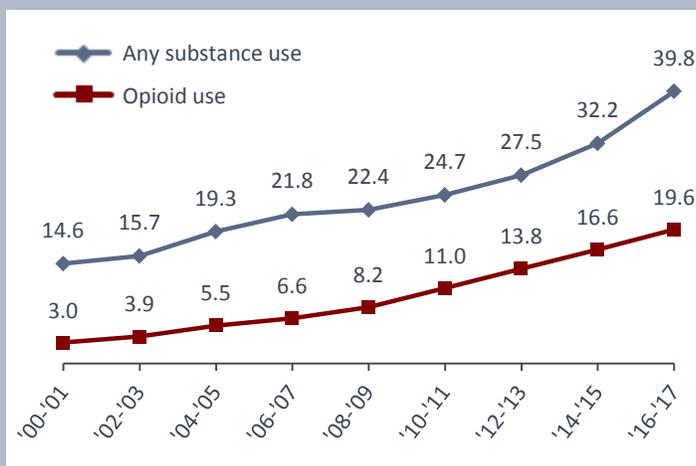
Substance use was present in **1 of every 25** maternal hospital stays, or 39.8 per 1,000, in 2016-2017. In 2000-2001, the rate was 1 in 69, or 14.6 per 1,000.

About **49%** of the 11,103 maternal hospital stays with substance use in 2016-2017 involved an opioid drug (5,469 hospital stays), the most common substance used.

Opioid use: 1 in 51

Opioid use was present in **1 of every 51** maternal hospital stays, or 19.6 per 1,000, in 2016-2017. In 2000-2001, the rate was 1 in 329, or 3.0 per 1,000.

Substance Use Rate per 1,000 Maternal Stays*



*New hospital coding requirements effective October 1, 2015 improved the identification of stays with substance use, so values before that date may be underestimated.

Maternal Stays involving Opioid Use in 2016-2017

Co-occurring conditions

Maternal stays with opioid use were more likely to have these co-occurring conditions compared to maternal stays without opioid use.

Co-occurring condition	With Opioid Use	Without Opioid Use
Tobacco use	67.3%	8.5%
Mental health disorder	40.0%	10.3%
Hepatitis C infection	32.0%	0.6%
Other substance use†	23.8%	2.1%
False or pre-term labor	8.1%	4.8%
Slowed growth of baby during pregnancy	7.5%	3.1%

†Includes the use of cannabis, cocaine, alcohol, etc.

Maternal Stays involving Opioid Use in 2016-2017

Payer differences

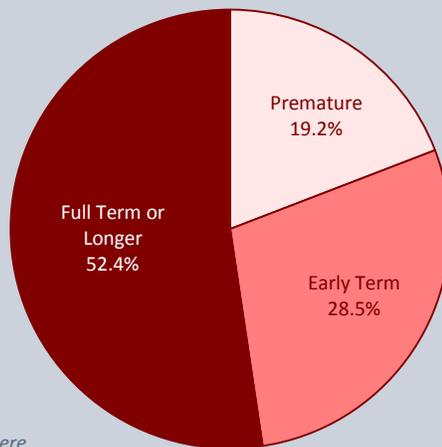
Nearly **82%** of maternal stays involving opioid use had Medicaid as the primary anticipated payer in 2016-2017, compared to about **39%** of maternal stays without opioid use. Commercial insurers were the primary anticipated payer for about 14% of maternal stays with opioid use and about 56% for those without opioid use.

Deliveries involving Opioid Use

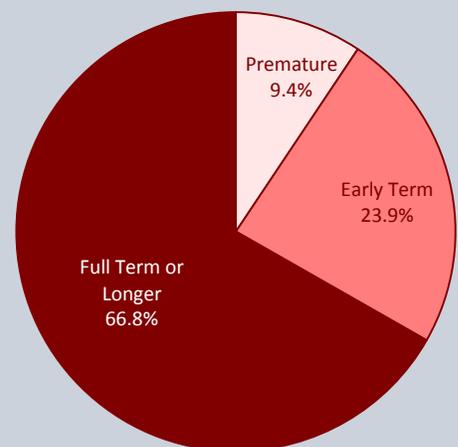
Deliveries before full term: 48%

Nearly **48%** of deliveries that involved maternal opioid use in 2016-2017 were premature (babies with less than 37 weeks gestation) or early term (babies with 37-38 weeks gestation), compared to about **33%** of deliveries that did not involve opioid use.

With Opioid Use



Without Opioid Use



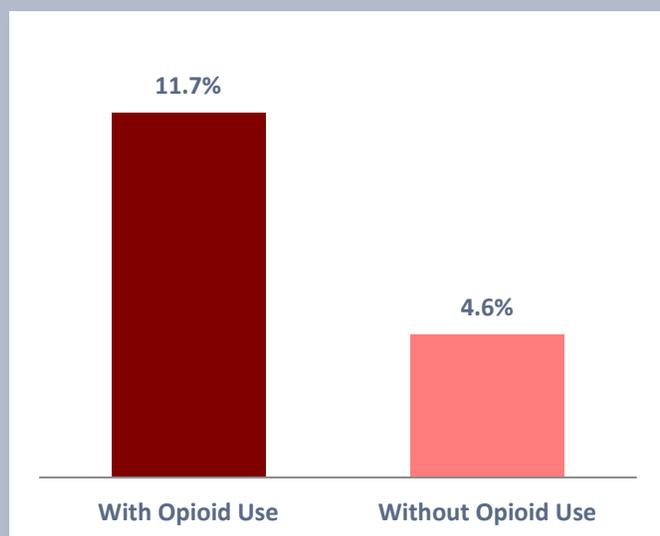
Delivery records with unknown/missing/conflicting gestation data (1.3% of cases) were excluded. Pie chart percentages may not add exactly to 100% due to rounding.

Readmissions within a year after delivery

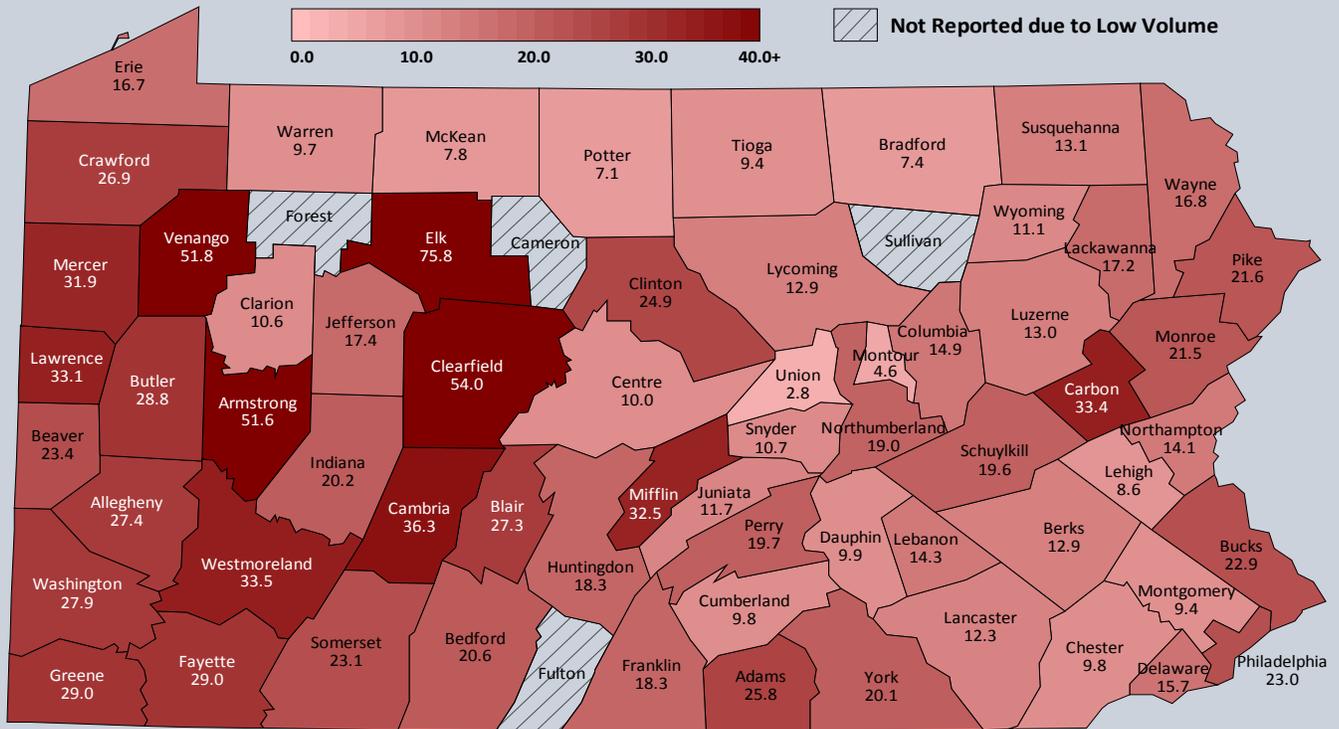
Rate of readmission. Among the 1,771 mothers who used opioids and gave birth in 2016, **11.7%** (or 207) were readmitted within one year, a rate that was more than 2.5 times the rate of **4.6%** (or 5,512 out of 118,839) for mothers who did not use opioids.

Delivery records that could not be studied for readmissions were excluded (e.g., records with missing linkage data, cases that were transferred to other hospitals, patients who died, etc.; 5.9% of cases).

Rate of Readmission within One Year



Rate of Opioid Use per 1,000 Maternal Hospital Stays by County of Residence, 2016-2017



Statewide, there were 19.6 maternal hospital stays involving opioid use per 1,000 maternal stays in the two-year period 2016-2017. Rates varied by:

- **Poverty rate.** The opioid use rate was 26.4 per 1,000 maternal stays for residents living in high poverty areas (where 40% or more of the population lives in poverty). The rate was 14.4 for residents living in low poverty areas (where less than 10% of the population lives in poverty).
- **Education.** The opioid use rate was 25.8 per 1,000 maternal stays for residents living in areas with lower levels of education (where less than 10% of the population has a bachelor's degree). The rate was 9.7 for residents living in areas with higher levels of education (where 40% or more of the population has a bachelor's degree).
- **Race/ethnicity.** The rates for white (non-Hispanic), black (non-Hispanic), and Hispanic residents were 24.5, 11.6, and 6.0, respectively.

Rate Calculations: Rates above included female residents age 12 to 55 and were calculated using PHC4 data and US Census Bureau data. Higher rates for some counties might be dependent on larger numbers of residents with high risk characteristics (e.g., factors related to poverty, education, and race/ethnicity). County rates were not adjusted for these patient characteristics so that important effects of these differences were not masked by such adjustment. Rates by poverty and education level were based on Census 2016 estimates of poverty and education at the zip code level. Rates by race and ethnicity were based on data provided by the hospitals. County and state rates relied on the total number of maternal hospital stays between 2016-2017 by county of residence.

About PHC4

Created by the PA General Assembly in 1986, the PA Health Care Cost Containment Council (PHC4) is an independent state agency charged with collecting, analyzing and reporting information that can be used to improve the quality and restrain the cost of health care in the state. Today, PHC4 is a recognized national leader in public health care reporting. PHC4 is governed by a 25-member board of directors, representing business, labor, consumers, health care providers, insurers and state government.

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Rate of Opioid Use per 1,000 Maternal Hospital Stays by County of Residence, 2016-2017

County Name	Number of Maternal Stays with Opioid Use	Rate of Opioid Use per 1,000 Maternal Stays
Statewide	5,469	19.6
Adams	47	25.8
Allegheny	748	27.4
Armstrong	60	51.6
Beaver	78	23.4
Bedford	18	20.6
Berks	127	12.9
Blair	69	27.3
Bradford	NR	7.4
Bucks	229	22.9
Butler	108	28.8
Cambria	99	36.3
Cameron	NR	NR
Carbon	40	33.4
Centre	23	10.0
Chester	96	9.8
Clarion	NR	10.6
Clearfield	80	54.0
Clinton	17	24.9
Columbia	18	14.9
Crawford	48	26.9
Cumberland	51	9.8
Dauphin	71	9.9
Delaware	218	15.7
Elk	47	75.8
Erie	107	16.7
Fayette	75	29.0
Forest	NR	NR
Franklin	54	18.3
Fulton	NR	NR
Greene	16	29.0
Huntingdon	14	18.3
Indiana	30	20.2
Jefferson	16	17.4

County Name	Number of Maternal Stays with Opioid Use	Rate of Opioid Use per 1,000 Maternal Stays
Juniata	NR	11.7
Lackawanna	78	17.2
Lancaster	152	12.3
Lawrence	63	33.1
Lebanon	45	14.3
Lehigh	72	8.6
Luzerne	89	13.0
Lycoming	32	12.9
McKean	NR	7.8
Mercer	70	31.9
Mifflin	28	32.5
Monroe	64	21.5
Montgomery	167	9.4
Montour	NR	4.6
Northampton	87	14.1
Northumberland	36	19.0
Perry	20	19.7
Philadelphia	1,084	23.0
Pike	14	21.6
Potter	NR	7.1
Schuylkill	55	19.6
Snyder	NR	10.7
Somerset	30	23.1
Sullivan	NR	NR
Susquehanna	NR	13.1
Tioga	NR	9.4
Union	NR	2.8
Venango	53	51.8
Warren	NR	9.7
Washington	118	27.9
Wayne	12	16.8
Westmoreland	213	33.5
Wyoming	NR	11.1
York	197	20.1

NR: Not reported due to low volume of total maternal stays and/or maternal stays with opioid use.