

Opioid Data Report

Linn County , IA

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Linn County, Iowa



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Introduction

Every day, more than 192 people die in the United States after overdosing on drugs (Centers for Disease Control and Prevention [CDC], 2019). Nearly 70% of these drug overdoses involve opioids, particularly synthetic opioids. At the onset of this issue, was an increase in prescribing of opioids to reduce patient pain and a subsequent increase in opioid-related overdoses in 1999 (U.S. Food & Drug Administration, 2019). A second wave of opioid-related overdoses attributed to heroin was noted in 2010 followed by a significant increase in opioid overdose deaths in 2013 attributed to synthetic opioids particularly illicitly-manufactured fentanyl (IMF). Overtime, populations and geographic areas impacted has evolved expanding from rural to urban areas and across different racial populations (Kiang, Basu, Chen, & Alexander, 2019). Increased opioid-related overdose deaths has particularly been highlighted in the eastern United States driven primarily by synthetic opioids. As overdoses increase in these eastern states, the trend begins to move toward the west. While opioid-overdoses in Iowa continue to be lower than other parts of the country it is essential that Iowa communities are prepared to respond as the presence of these IMF products spread into the Midwest. The purpose of this report is to provide a snapshot of the occurrence of opioid overdoses in Linn County, using multiple types of data to illustrate current status of the epidemic. Additional data and information can be found on the Linn County Opioid Steering Committee’s website at: <https://www.linncounty.org/1287/Opioid-Steering-Committee>.

Opioid-Related Deaths

Overtime, opioid-related deaths in Linn County have remained stable (Table 1 & Figure 1). However, mortality rates related to opioid overdoses continue to exceed that of Iowa, but generally fall below the United States. Despite the general trend, in 2014-2015 the rate in Linn County matched that of the United States. During this time, Linn County began seeing an appearance of illicitly-manufactured fentanyl (IMF) in the drug supply particularly in 2015. Approximately, 50% of opioid-related overdoses deaths during this time involved an IMF.

Table 1. Age-Adjusted Opioid-Related Mortality Rate in Linn County, Iowa, and US

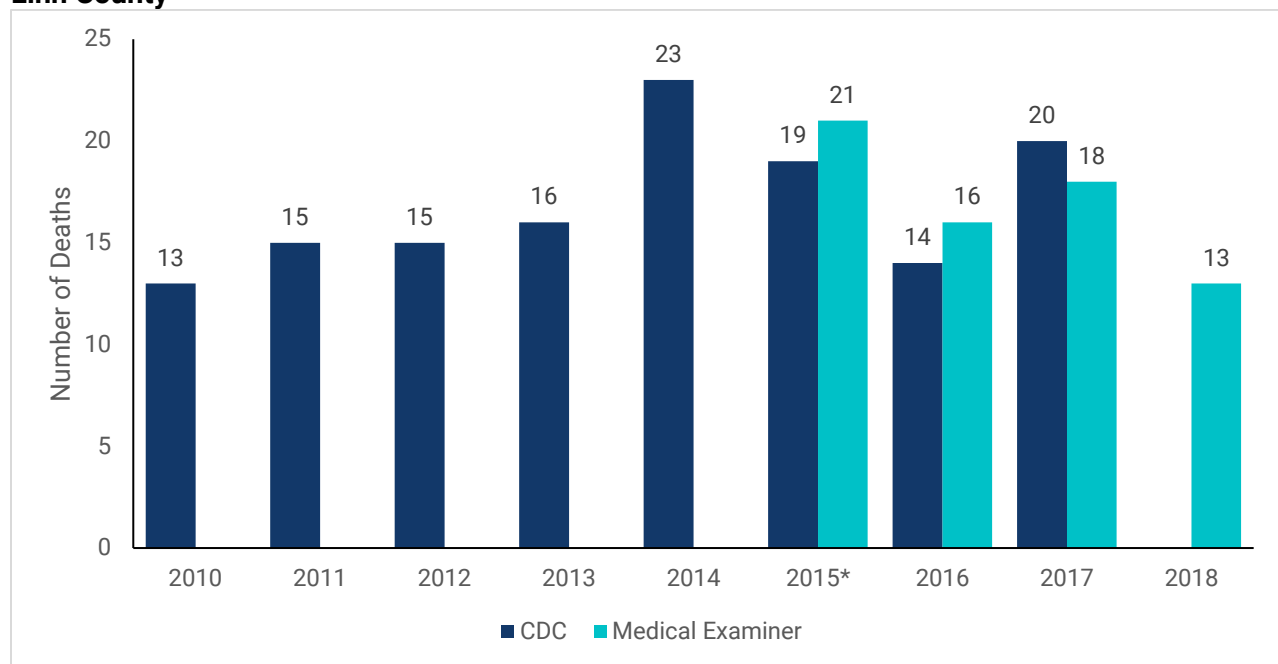
		2010-2011	2012-2013	2014-2015	2016-2017
Linn County	#	28	31	42	34
	Rate per 100,000	6.5	7.3	10.1	7.9
Iowa	#	346	375	353	409
	Rate per 100,000	2.9	6.4	5.9	6.9
United States	#	45,813	50,125	63,812	92,346
	Rate per 100,000	7.4	8.0	10.1	14.4

Source: CDC WONDER

Multiple Source

Overdose deaths are examined using death certificate data published through CDC WONDER to capture overall age-adjusted death rates and demographic characteristics when available in combination with the Linn County Medical Examiner's (ME) Data (Figure 1). ME data is used to explore more specific overdose information such as geographic and demographic characteristics of overdose victims, overdose intent, and drugs associated with the overdose. Both datasets have pros and cons to use; however, when used in combination it provides a clearer picture of the occurrence of overdose deaths in Linn County. There is a slight discrepancy in number of deaths reported between the two sources, which may indicate either underreporting to the ME's office or coding discrepancies on the death certificate. With any national report of local data, lag-time is to be expected; the ME data compensates for this lag in data by providing a closer approximate in near-real time following an investigation. Both data sources will be used to support this report.

Figure 1. Number of Opioid-Related Deaths captured in death vs Medical Examiner Records, Linn County



Source: CDC WONDER & Linn County Medical Examiner's Office

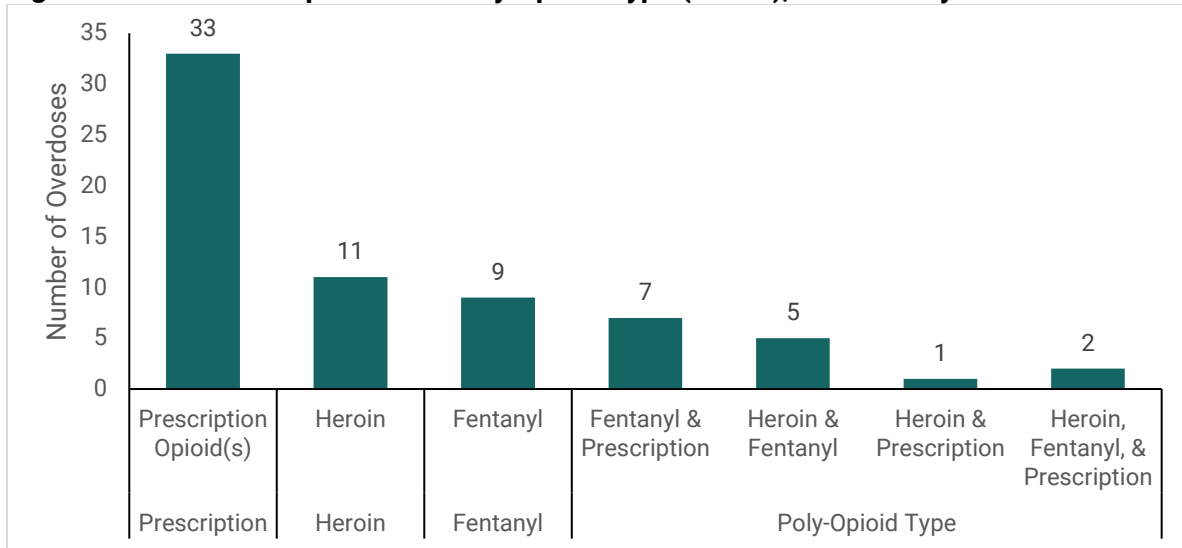
*First available year of opioid-related overdose deaths from the Medical Examiner

Polysubstance Issue

Of the 68 opioid-related deaths that occurred between 2015 and 2018, 56 or 82.4% included two or more substances at the time of death. A majority of these deaths included a prescription opioid (Figure 2). However, other types of drugs were also present upon death. Figure 3, illustrates the individual drugs that were most commonly present in a drug overdose. The size of the word in the figure correlates to the number of times noted in an opioid overdose. Between 2015 and 2018, Fentanyl and Opiates

were the most commonly present individual drugs with 22 associations each, followed by Heroin (n = 19) and Cocaine (n = 12). Of recent note is the re-emergence of Methamphetamine, which was associated with 7 of the 13 opioid-related overdose deaths and 11 of the 26 overall drug overdose deaths in 2018 (Linn County Medical Examiner's Office).

Figure 2. Number of Opioid Deaths by Opioid Type (n = 68), Linn County: 2015-2018



Source: Linn County Medical Examiner's Office

Figure 3. Drugs Associated with Opioid Overdose Death (n = 68), Linn County: 2015-2018

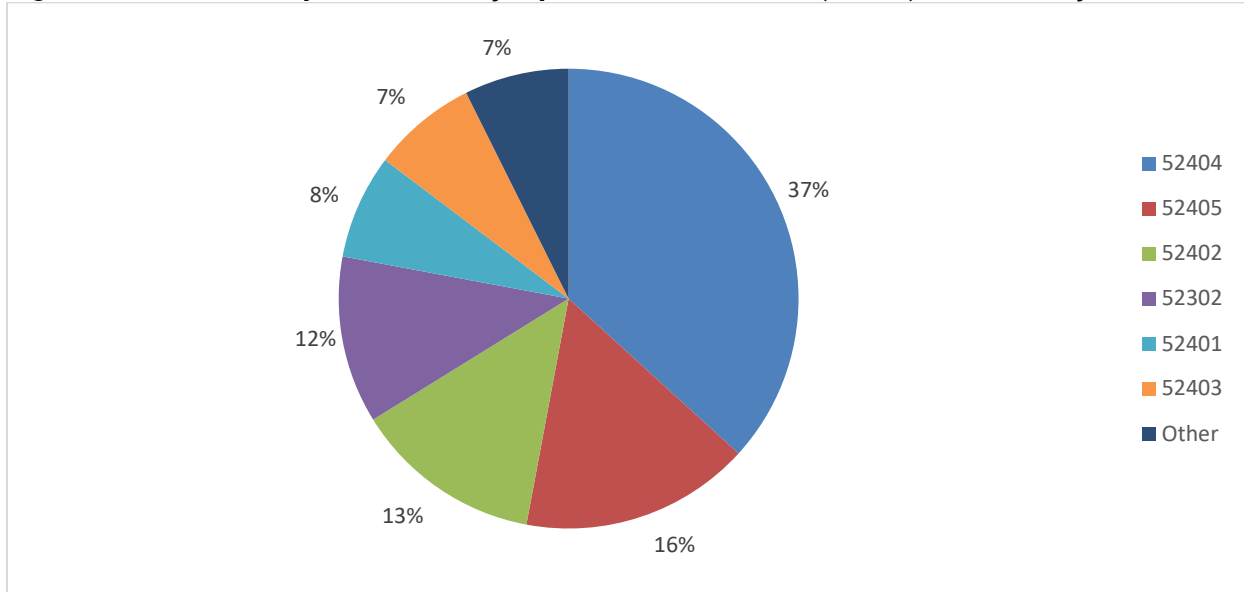


Source: Linn County Medical Examiner's Office

Geographic Characteristics

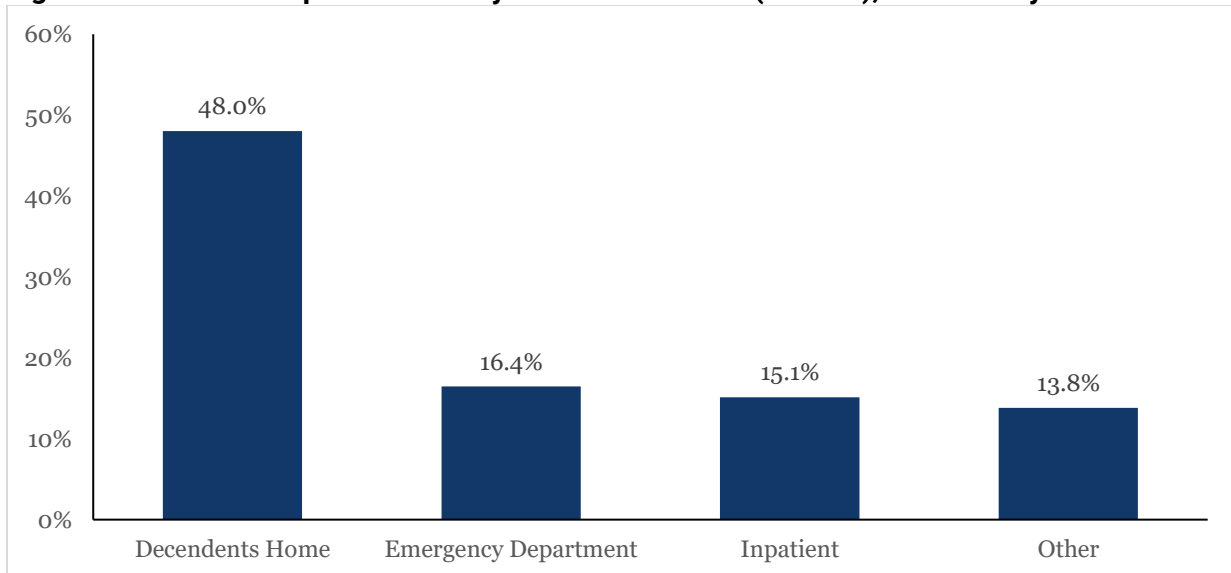
A majority (n = 83.8%) of opioid overdose deaths are among those living in the city of Cedar Rapids. However, the greatest concentration of overdose cases across all zip codes is within the 52404 zip code (Figure 4). These cases account for 37% of all overdose deaths between 2015 and 2018. While approximately 48% of overdose victims expire at their residence, an additional 31.5% do so at a later point within a hospital setting (Figure 5).

Figure 4. Percent of Opioid Deaths by Zip Code of Residence (n = 68), Linn County: 2015-2018



Source: Linn County Medical Examiner's Office

Figure 5. Percent of Opioid Deaths by Location of Death (n = 152), Linn County: 2008-2017

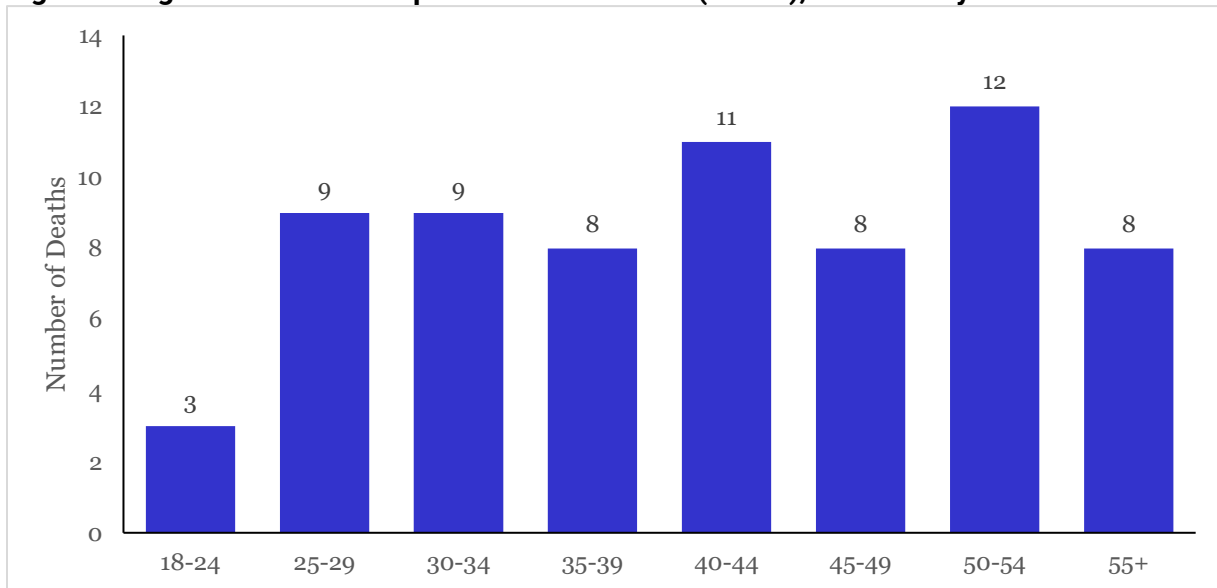


Source: CDC WONDER

Demographic Characteristics

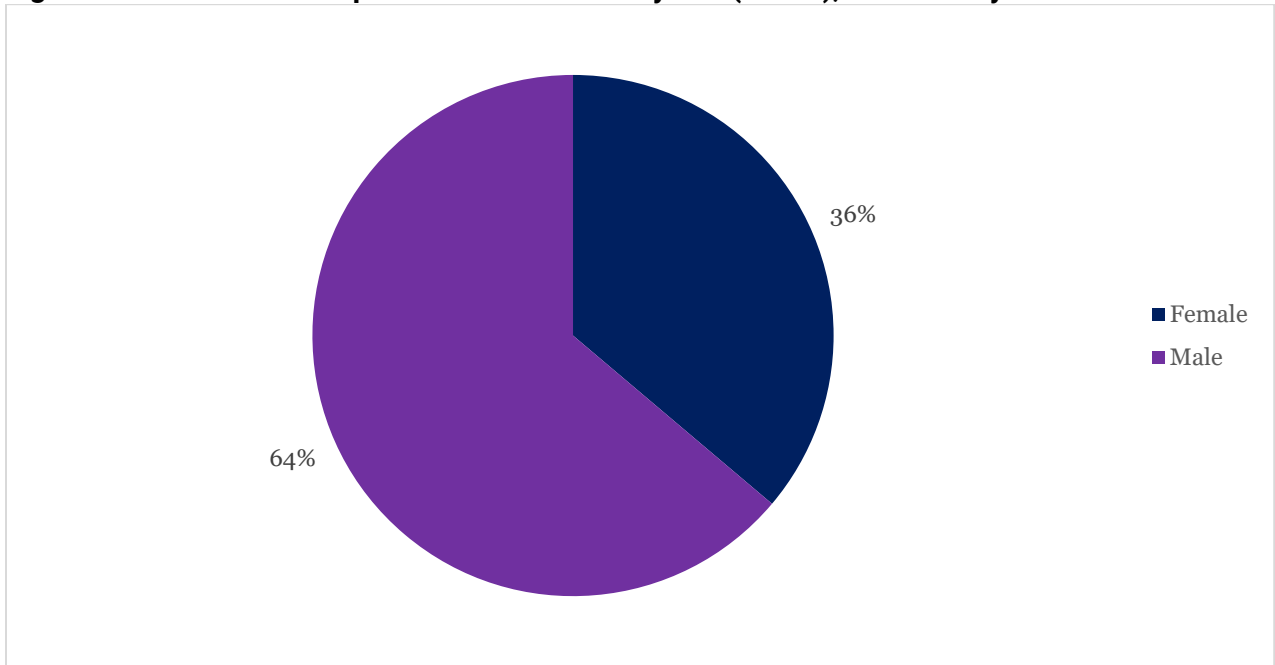
Opioid overdose victims in Linn County range in age from 18 to 81 years of age with a median of 41.5 years. While overdoses are distributed similarly across the age categories, individuals between 40 and 54 years appear to be at greater risk for dying of an opioid overdose than their younger or older counterparts (Figure 6). In the first iteration of this report in 2018, opioid deaths were found to be equally distributed across males and females, with males representing 52% of opioid overdose deaths in 2014-2016. However, between 2016 and 2018 this distribution significantly shifted with males now accounting for 64% of opioid overdose deaths (Figure 7). The cause of this shift is unknown. As may be expected, white residents account for the majority of opioid-related overdose deaths in Linn County comprising 93% of all opioid overdose deaths (Figure 8). Upon further investigation, there does not seem to be significant patterns in distribution of deaths by sex or race in relation to the other available factors (i.e. geography, opioid type, etc). However, the presence of opioid prescription drugs related to the overdose is more common among the 40-54 year population; which may be associated with increased injuries as an individual ages. A majority of these cases also include other types of prescription and illicit drugs including muscle relaxants, sleep aids, antidepressants, alcohol, benzodiazepines (tranquilizers), and multiple types of opioid prescriptions.

Figure 6. Age Distribution of Opioid-Related Deaths (n = 68), Linn County: 2015-2018



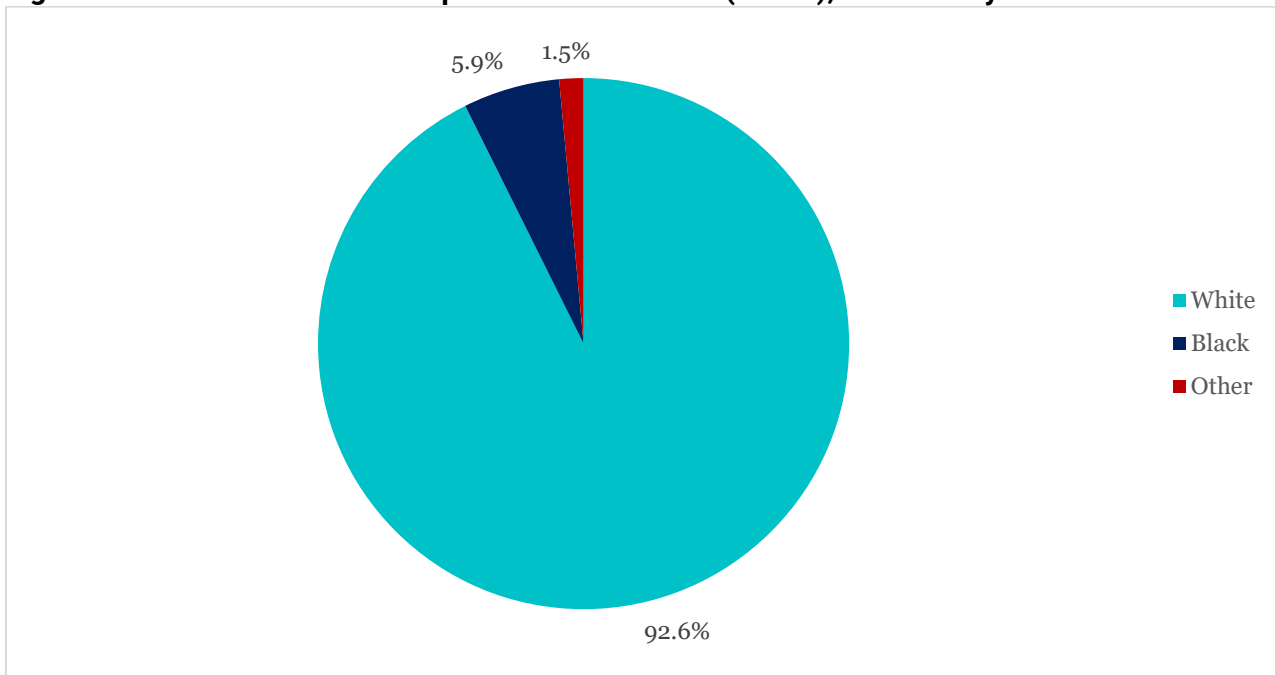
Source: Linn County Medical Examiner's Office

Figure 7. Distribution of Opioid-Related Deaths by Sex (n = 47), Linn County: 2016-2018



Source: Linn County Medical Examiner's Office

Figure 8. Racial Distribution of Opioid-Related Deaths (n = 68); Linn County: 2015-2018

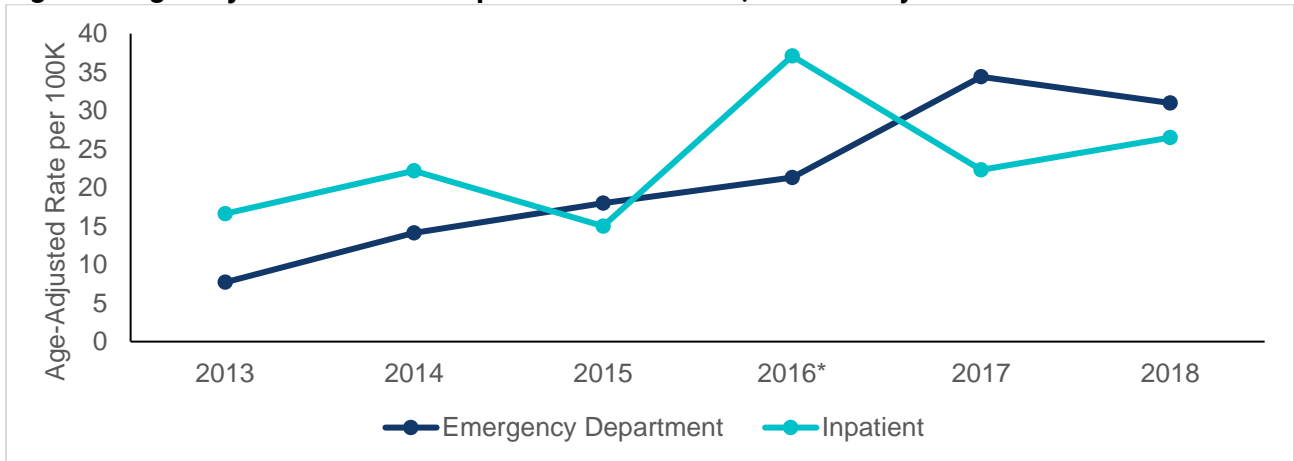


Source: Linn County Medical Examiner's Office

Non-Fatal Opioid Overdoses

Non-fatal opioid overdoses include all initial encounters associated with an overdose where an opioid was present. For the purpose of this report, non-fatal opioid overdoses will include emergency department and inpatient hospitalizations associated with an opioid overdose. A direct comparison with Iowa and the United States is not available, as such this section will focus on Linn County data only. As illustrated in Figure 9 and shown in Table 2, as the death rate has remained stable both inpatient and emergency department (ED) visits for an opioid overdose has increased over time. Between 2015 and 2016, there was a statistically significant increase in the rate of inpatient opioid overdose visits, increasing from 15 hospitalizations per 100,000 population in 2015 to 37.1 visits per 100,000 in 2016. The increase may have occurred due to increased report of cases during the transition from ICD-9-CM to ICD-10-CM coding during this period. However, it is also possible that the increase correlates with the emerging presence of illicitly-manufactured fentanyl in Linn County during this period, causing more severe outcomes from overdose. In the years following 2016, the hospitalization rate decreased as ED visits continued to steadily increase.

Figure 9. Age-Adjusted Non-Fatal Opioid Overdose Rate; Linn County



Source: Hospitalization and emergency department data are collected by the Iowa Hospital Association on behalf of IDPH in accordance with Iowa Code section 135.166; U.S. Census Bureau – Annual Estimates

*There was a transition from ICD-9 to ICD-10 codes.

Table 2. Non-Fatal Age-adjusted Opioid-Related Overdose Rate, Linn County: 2013-2018

		2013	2014	2015	2016*	2017	2018
Emergency Department Visits	#	20	31	40	50	77	70
	Rate per 100,000 population	7.7	14.1	18.0	21.3	34.4	31.0
Inpatient Visits	#	36	48	33	80	51	60
	Rate per 100,000 population	16.6	22.2	15.0	37.1	22.3	26.5

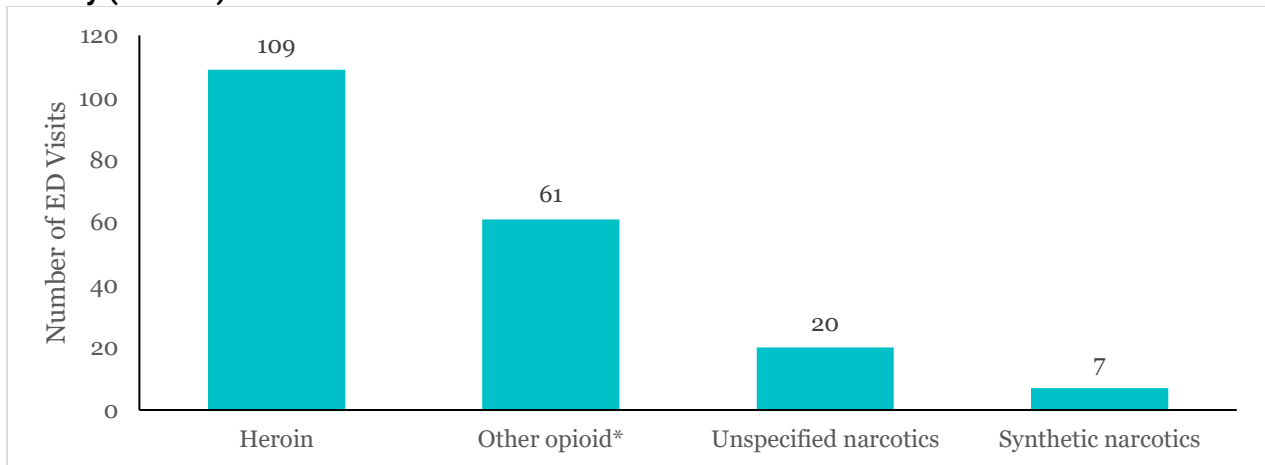
Source: Hospitalization and emergency department data are collected by the Iowa Hospital Association on behalf of IDPH in accordance with Iowa Code section 135.166; U.S. Census Bureau – Annual Estimates

*There was a transition from ICD-9 to ICD-10 codes.

Emergency Department

The majority (n= 109) of opioid overdoses treated in the Emergency Department (ED) were associated with Heroin (Figure 10), followed by other opioid types (n = 61). “Other opioids” encompass prescription opioids, methadone, and presence of multiple opioids. Of the 61 opioid overdoses identified as “other”, 56 were attributed to prescription opioids. Most often, opioid overdoses are accidental, comprising 79% of opioid overdose cases in the ED (Figure 11). However, 22 opioid overdoses were intentional, a majority of which (n = 63.6%) were associated with an overdose from prescription opioids. Of the 19 overdoses with an undetermined intent, 11 were associated with a heroin overdose.

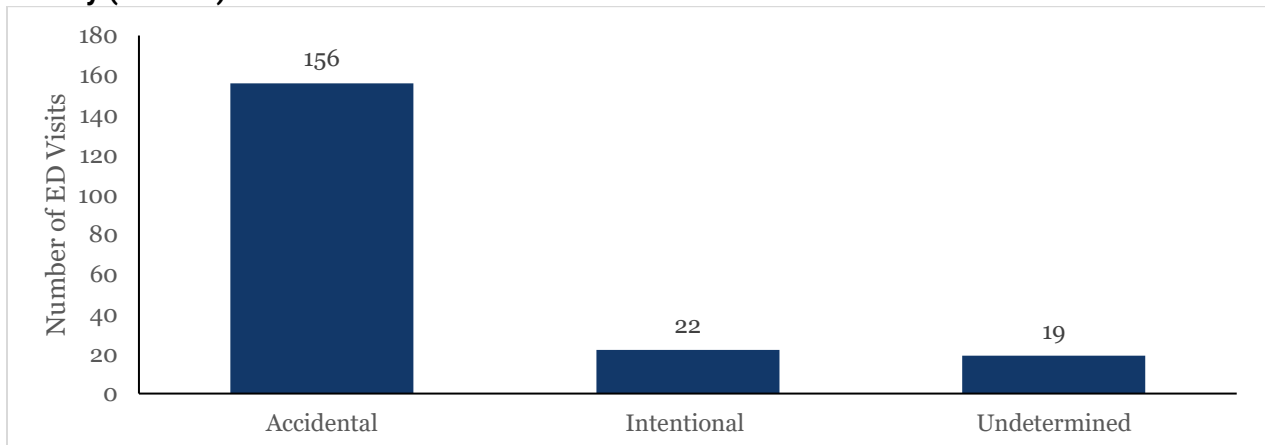
Figure 10. Opioid-Related Overdoses to the Emergency Department by Type of Opioid, Linn County (n = 197): 2016-2018



Source: Hospitalization and emergency department data are collected by the Iowa Hospital Association on behalf of IDPH in accordance with Iowa Code section 135.166

*Other opioid includes prescription opioids, methadone, and presence of multiple opioids

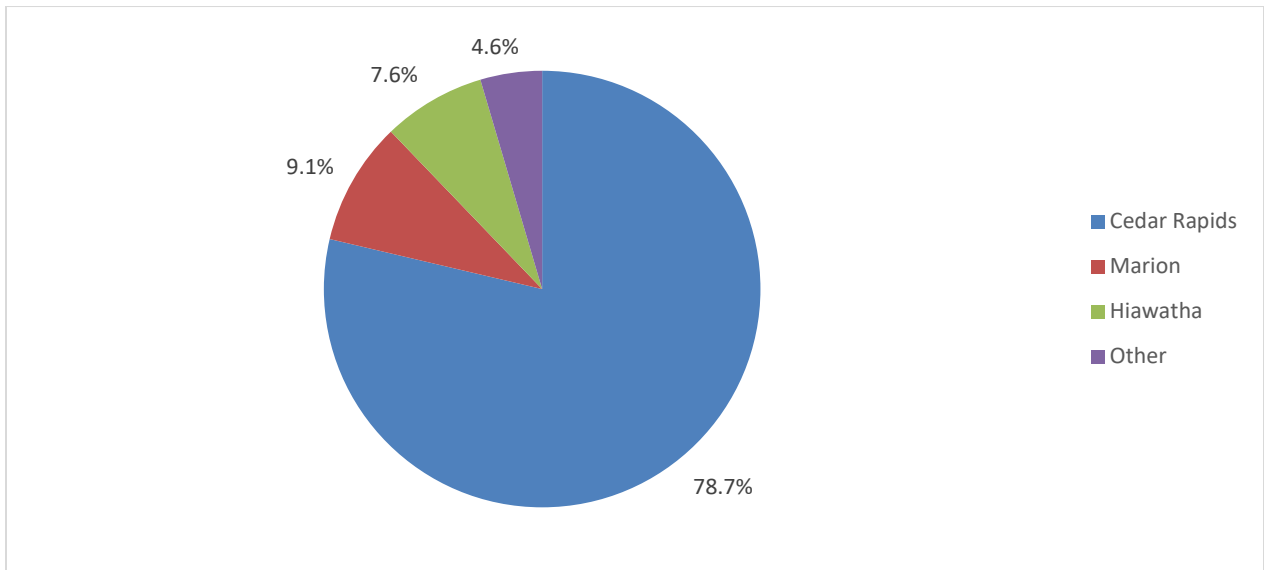
Figure 11. Opioid-Related Overdoses to the Emergency Department by Overdose Intent, Linn County (n = 197): 2016-2018



Source: Hospitalization and emergency department data are collected by the Iowa Hospital Association on behalf of IDPH in accordance with Iowa Code section 135.166

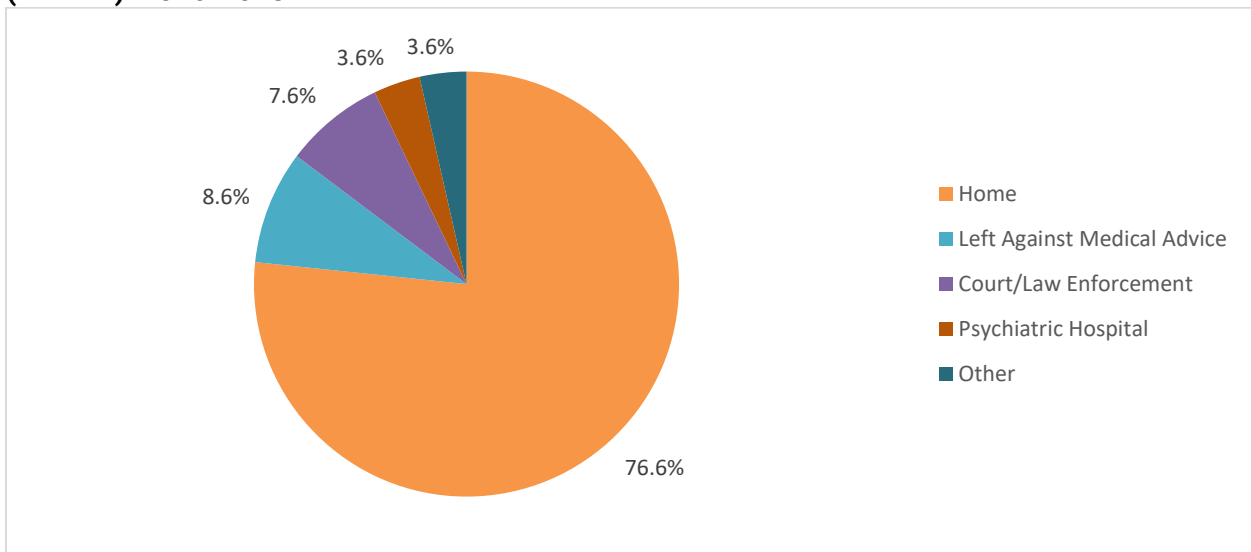
Of the opioid overdoses treated in the Emergency Department (ED), 79% were residents of Cedar Rapids, primarily residing in the 52402 (n =35), 52403 (n = 45), and 52404 (n =52) zip codes (Figure 12). A majority of overdose victims treated in the ED are discharged to their own care at home (Figure 13). Of the 147 opioid overdoses that were treated in the ED in 2017 and 2018, 37 were attributed to 14 patients ranging in number of overdoses from 2 to 6 during this time.

Figure 12. Opioid-Related Emergency Department Visits by City, Linn County (n = 197): 2016-2018



Source: Hospitalization and emergency department data are collected by the Iowa Hospital Association on behalf of IDPH in accordance with Iowa Code section 135.166

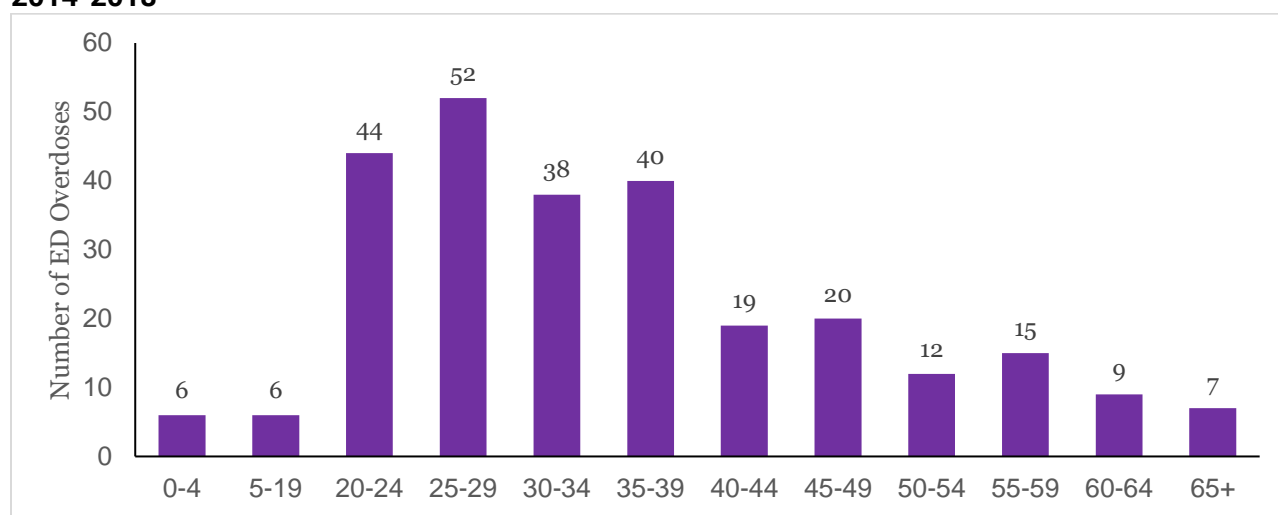
Figure 13. Opioid-Related Emergency Department Visits by Discharge Status, Linn County (n = 197): 2016-2018



Source: Hospitalization and emergency department data are collected by the Iowa Hospital Association on behalf of IDPH in accordance with Iowa Code section 135.166

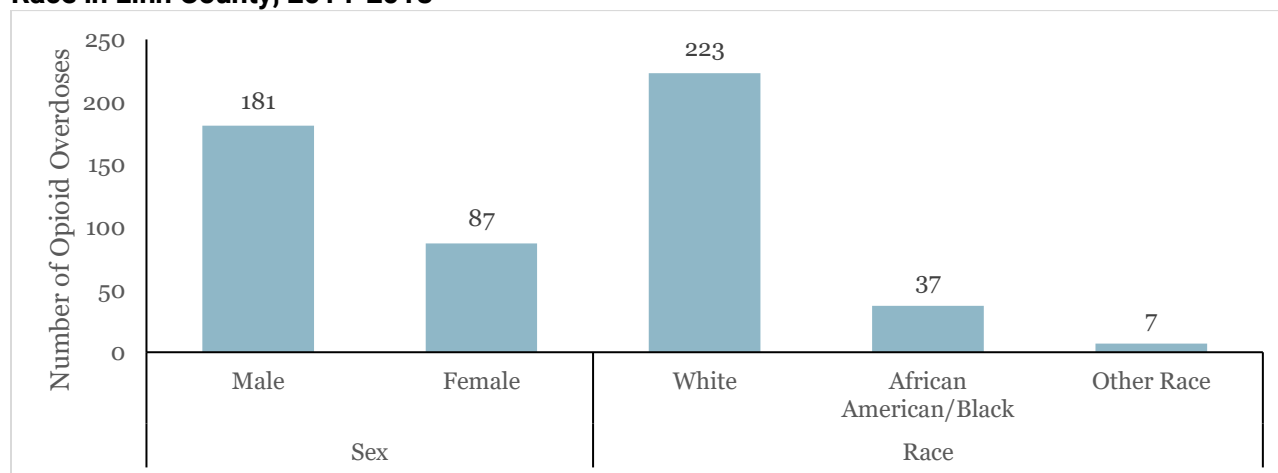
Demographic Characteristics. Individuals treated in the Emergency Department (ED) for an opioid overdose were most commonly between the ages of 20 and 39 years of age, with an overall range between 0 and 83 years (Figure 14). The youngest age group, 0 to 4 years included overdoses associated with prescription opioids and synthetic narcotics. Heroin was the most common opioid associated with overdoses among the 20 to 39 age groups, comprising 73% of opioid overdoses among this group. Opioid overdose patients in the ED tend to be male and white (Figure 15). However, the incidence rate among black residents exceeds that of their white counterparts with a rate of 34.1 opioid overdose visits in the ED per 10,000 population compared to 11.4 per 10,000, respectively.

Figure 14. Proportion of Opioid Overdoses in the Emergency Department by Age: Linn County, 2014-2018



Source: Hospitalization and emergency department data are collected by the Iowa Hospital Association on behalf of IDPH in accordance with Iowa Code section 135.166

Figure 15. Distribution of Opioid Overdose Visits to the Emergency Department by Sex and Race in Linn County, 2014-2018

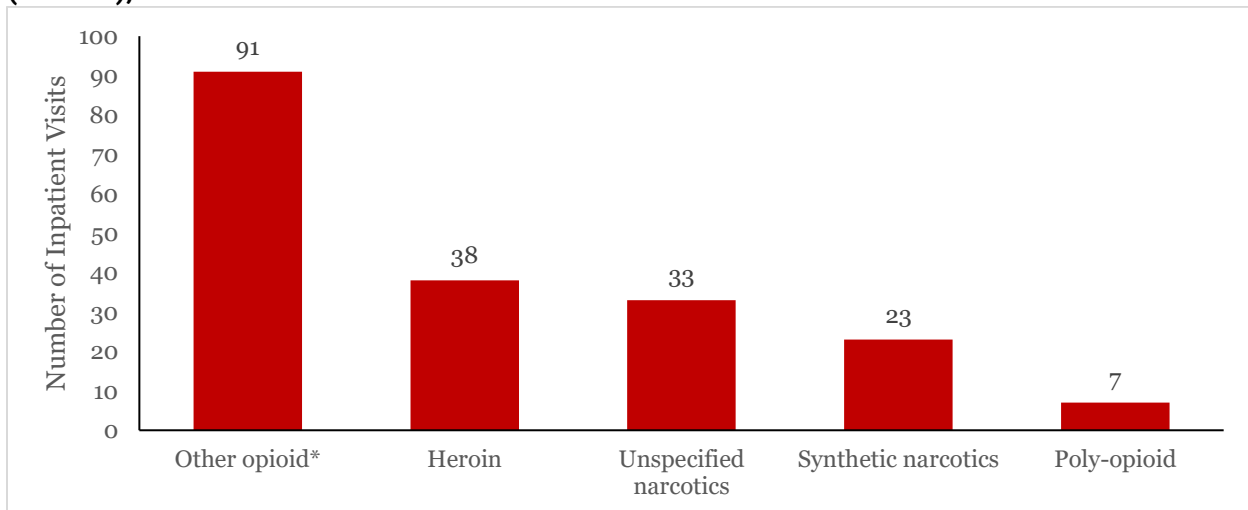


Source: Hospitalization and emergency department data are collected by the Iowa Hospital Association on behalf of IDPH in accordance with Iowa Code section 135.166

Inpatient/Hospitalizations

Unlike opioid overdoses treated in the Emergency Department, hospitalizations for an opioid overdose is most commonly associated with “Other opioids” (Figure 16). Other opioids encompass prescription medications and methadone, with prescription opioids comprising 96.7% of the other opioid type. An equal distribution of opioid overdose hospitalizations were accidental vs intentional. However, a greater distribution of prescription opioids (n = 46.6%) and synthetic narcotics (n =65.2%) were associated with intentional overdose where heroin (n = 55.3%) and unspecified narcotics (n = 54.5%) were more likely to be associated with an accidental overdose.

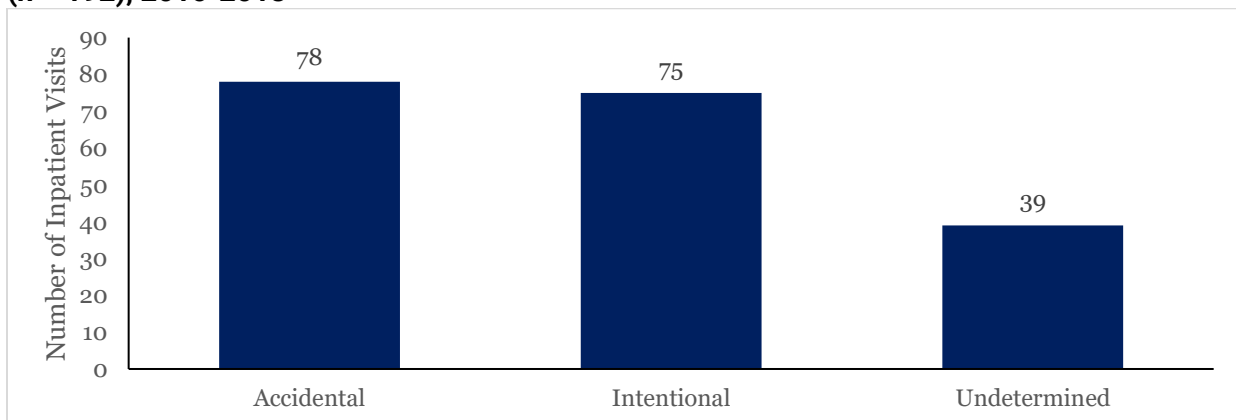
Figure 16. Proportion of Opioid Overdose Hospitalizations by Opioid Type in Linn County (n = 192), 2016-2018



Source: Hospitalization and emergency department data are collected by the Iowa Hospital Association on behalf of IDPH in accordance with Iowa Code section 135.166

*Other opioid includes Prescription Opioids and Methadone

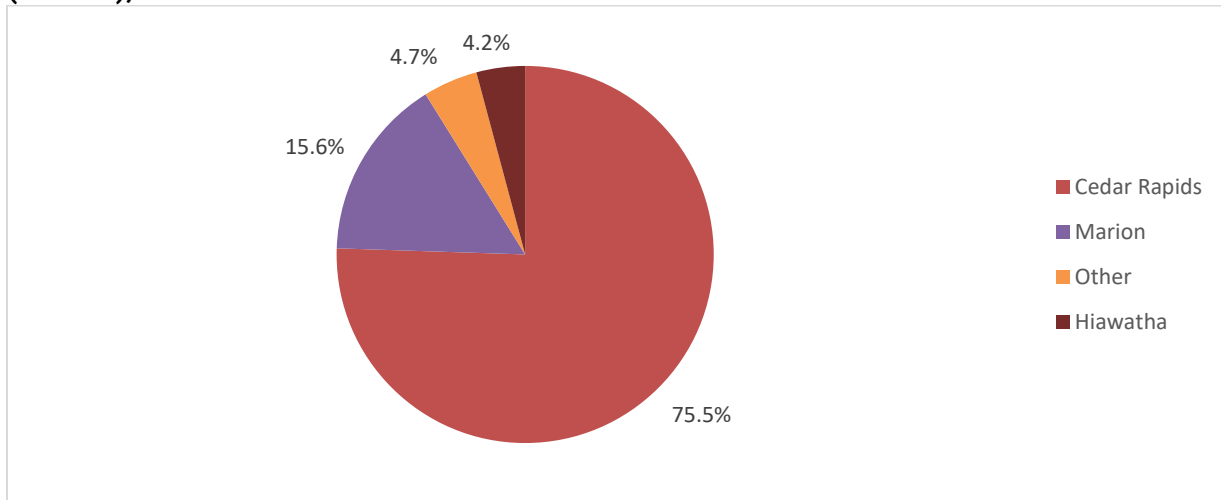
Figure 17. Proportion of Opioid Overdose Hospitalizations by Overdose Intent in Linn County (n = 192), 2016-2018



Source: Hospitalization and emergency department data are collected by the Iowa Hospital Association on behalf of IDPH in accordance with Iowa Code section 135.166

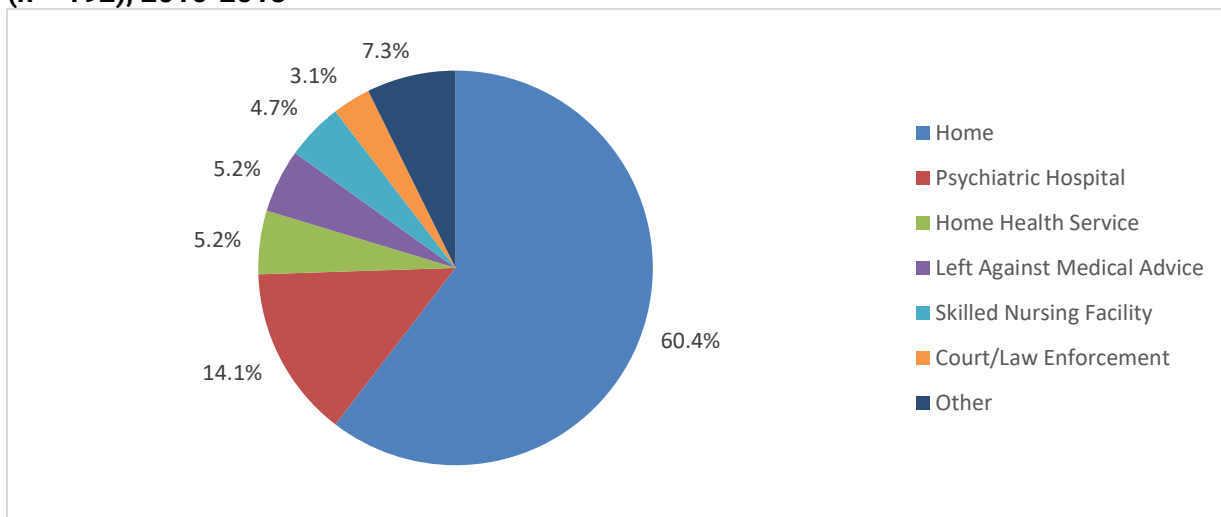
Similar to that of opioid overdoses treated in the Emergency Department, individuals hospitalized for an opioid overdose most commonly reside in zip codes associated with the city of Cedar Rapids and Marion (Figure 18). Residents from the high concentration zip codes of 52402, 52403, 52404, 52405, and 52302 (City of Marion) account for 162 of the 192 opioid overdose hospitalizations. A majority of inpatient opioid overdose cases are discharged to self-care at home (n = 61%); however, 14% were discharged to a psychiatric hospital (Figure 19). On average, inpatient opioid overdose clients are hospitalized for 3.2 days, with 30.7% hospitalized one day, 47.9% two to four days, 17.7% five to nine, and 3.6% ten or more days.

Figure 18. Percentage of All Opioid Overdose Hospitalizations by Linn County City (n = 192), 2016-2018



Source: Hospitalization and emergency department data are collected by the Iowa Hospital Association on behalf of IDPH in accordance with Iowa Code section 135.166

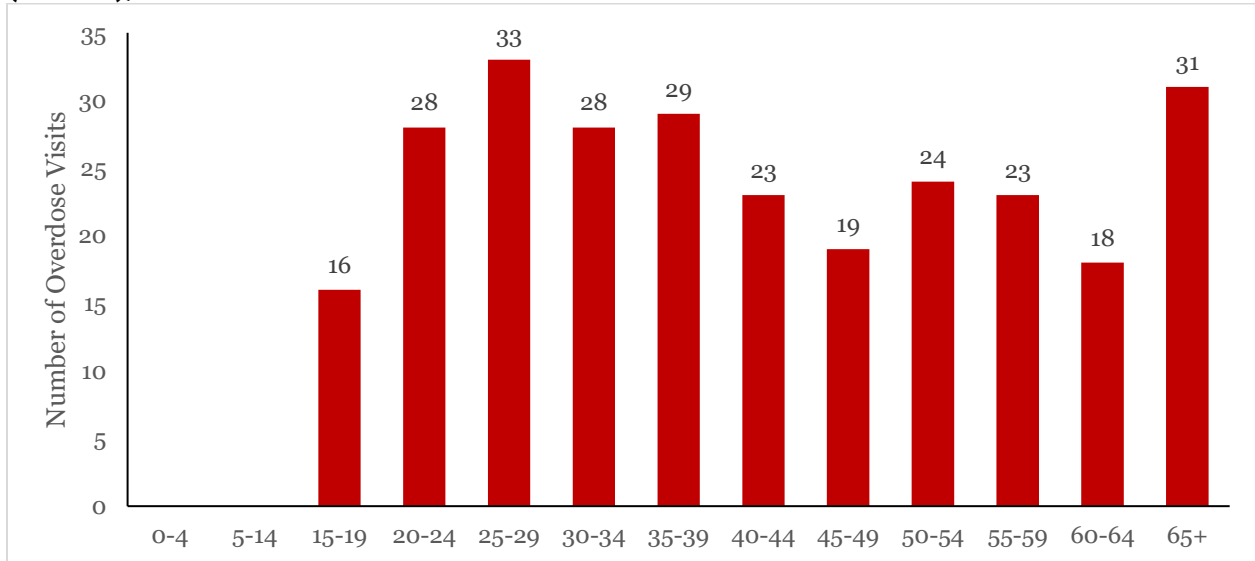
Figure 19. Percentage of Opioid Overdose Hospitalizations by Discharge Status, Linn County (n = 192), 2016-2018



Source: Hospitalization and emergency department data are collected by the Iowa Hospital Association on behalf of IDPH in accordance with Iowa Code section 135.166

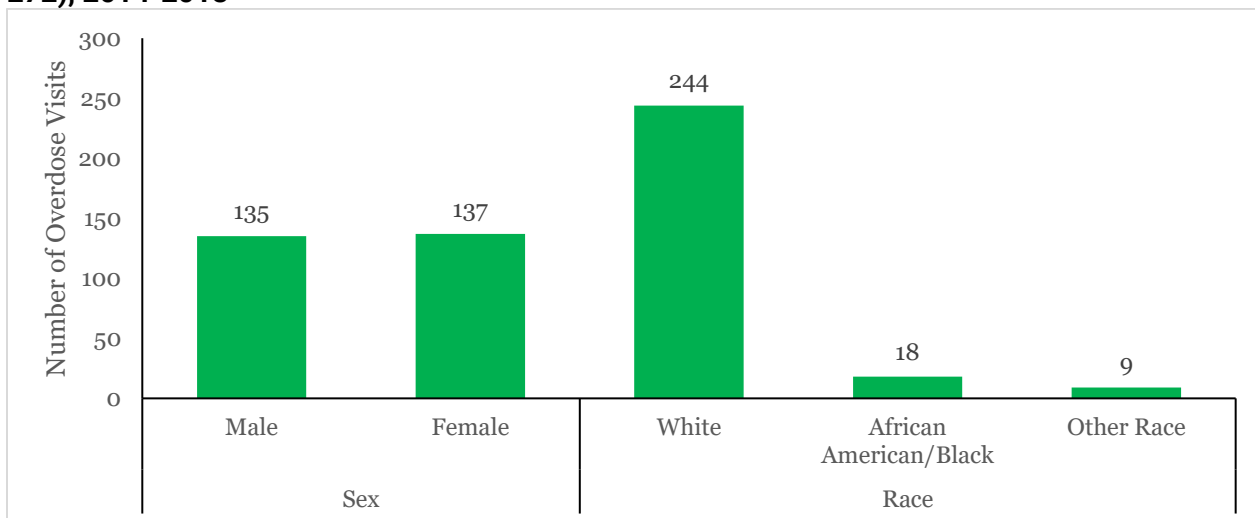
Demographic Characteristics. There is a wide age distribution of individuals hospitalized for an opioid overdose ranging from 15 to 91 years of age, with a median age of 43.5 years. Distribution of opioid overdose hospitalizations among male and females was equal (Figure 21). A majority of opioid overdose patients are white (n = 244). However, black residents have a slightly higher incidence of hospitalization for an opioid overdose with an incidence of 16.6 hospitalizations for opioid overdose per 10,000 black residents compared to 12.5 per 10,000 white residents.

Figure 20. Distribution of Opioid Overdose Hospitalizations by Age in Linn County (n = 272), 2014-2018



Source: Hospitalization and emergency department data are collected by the Iowa Hospital Association on behalf of IDPH in accordance with Iowa Code section 135.166

Figure 21. Proportion of Opioid Overdose Hospitalizations by Sex and Race in Linn County (n = 272), 2014-2018



Source: Hospitalization and emergency department data are collected by the Iowa Hospital Association on behalf of IDPH in accordance with Iowa Code section 135.166

Conclusion

Despite a relatively stable number of opioid overdose deaths in Linn County over the past several years, instances of non-fatal opioid overdose cases continue to increase. A majority of opioid overdose deaths and hospitalizations are associated with prescription opioids, where opioid overdoses treated in the Emergency Department (ED) are most commonly associated with heroin. In addition to the presence of opioids among overdose deaths, a majority of these deaths are also associated with other types of illicit and prescription medications. Males tend to be associated with an opioid overdose death or ED visit; however, an equal distribution of males and females are hospitalized for an opioid overdose. Despite a larger number of non-fatal and fatal opioid overdose being associated with white residents, the incidence rate among black residents is higher than their white counterparts. Overdose victims are more likely to reside within the city of Cedar Rapids; however, there is an increase in the proportion of opioid overdoses associated with the city of Marion. The age distribution of individuals who overdose on opioids vary with the largest number of overdose deaths occurring among residents 40 and 54 years of age, overdoses treated within the ED tend to occur among residents between 20 and 39 years, and hospitalizations occurring across a wide age range. Non-fatal opioid overdose patients tend to be discharged to their home under their own care; however, approximately 27% of individuals hospitalized for an opioid overdose are transferred to a psychiatric hospital, which is typically associated with an intentional overdose.

References

- Centers for Disease Control and Prevention. (2019). Drug overdose deaths. Opioid Overdose. Retrieved from <https://www.cdc.gov/drugoverdose/data/statedeaths.html>
- Kiang, M. V., Basu, S., Chen, J, & Alexander, M. J. (2019). Assessment of changes in the geographical distribution of opioid-related mortality across the United States by opioid type, 1999-2016. *JAMA Network Open*, 2(2). doi:10.1001/jamanetworkopen.2019.0040
- U.S. Food & Drug Administration. (2019). Timeline of selected FDA activities and significant events addressing opioid misuse and abuse. Retrieved from <https://www.fda.gov/drugs/information-drug-class/timeline-selected-fda-activities-and-significant-events-addressing-opioid-misuse-and-abuse>

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