

COCAINE-INVOLVED DRUG OVERDOSES

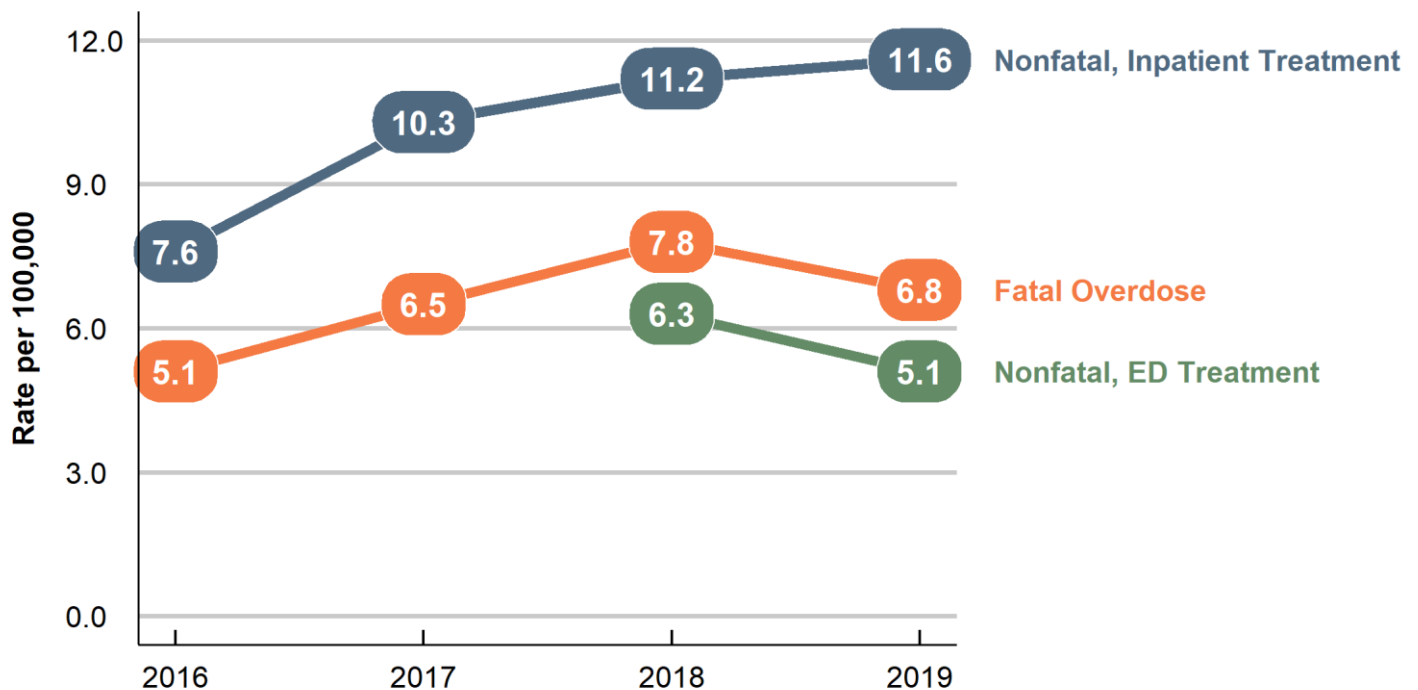
MICHIGAN 2019



Short-Term Trends in Cocaine-Involved Overdoses

Cocaine-involved overdoses are a growing public health concern in Michigan and nationwide. During 2019, 682 Michigan residents died of a drug overdose involving cocaine. During the same year, Michigan acute-care hospitals admitted 1,163 nonfatal cocaine-involved overdoses for inpatient care and there were 505 nonfatal cocaine-involved overdoses treated and released from an emergency department (ED). Between 2016 and 2019, the rate of inpatient hospitalizations for nonfatal cocaine-involved overdoses increased by 52.6 percent and the rate of fatal cocaine-involved overdoses increased by 33.3 percent (Figure 1). Data on emergency department visits, which are not available for 2016 and 2017, demonstrate a 19.0 percent decrease from 2018 to 2019.

Figure 1: Crude Rate (per 100,000) of Fatal¹ and Nonfatal Inpatient² and Emergency Department³ Visits for Cocaine-Involved Overdoses among Michigan Residents, 2016-2019⁴



1. 2016-2019 Michigan Resident Death File

2. 2016-2019 Michigan Resident Inpatient File, Michigan Health & Hospital Association

3. 2018-2019 Michigan Resident Outpatient File, Michigan Health & Hospital Association

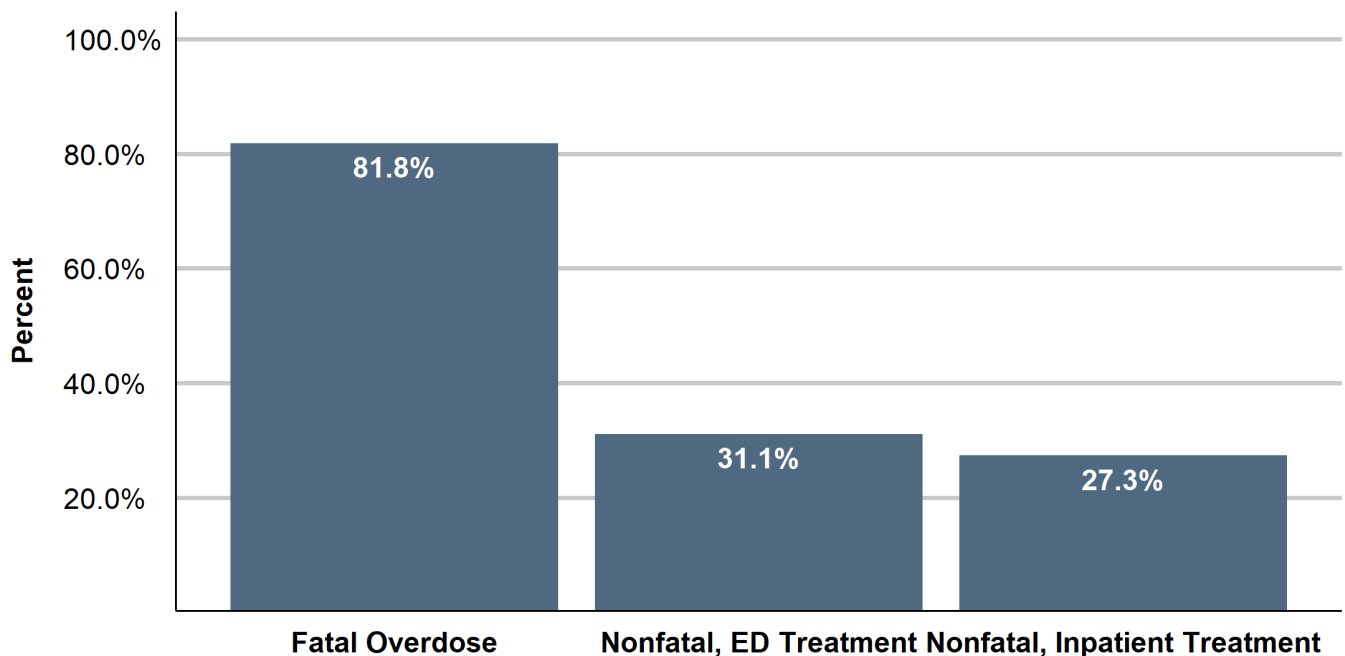
4. Vintage 2019 postcensal estimates of the resident population (July 1, 2010-July 1, 2019), National Center for Health Statistics. Intercensal estimates of the resident population (July 1, 2009), National Center for Health Statistics.

Notes: Nonfatal cocaine-involved drug overdoses (inpatient and emergency department treatment) include visits with any ICD-10-CM code of T40.5X(1-4)A. Fatal cocaine-involved drug overdoses include deaths with an underlying cause of death of X40-X44, X60-X64, X85, or Y10-Y14 and a contributing cause of death ICD-10 code of T40.5.

Opioid Involvement in Cocaine Overdoses

In 2019, slightly more than two out of five cocaine-involved overdoses (43.9 percent) also involved one or more opioids such as heroin, fentanyl, or prescription opioid painkillers. Based on a Chi-Square Test of Association, the prevalence of opioid involvement among cocaine-involved overdoses significantly differed by the overdose outcome (i.e., death, admitted for inpatient treatment, ED treatment only) ($\chi^2 = 562.6$, $p < 0.001$). Opioids were present in the majority (81.8 percent) of fatal cocaine-involved overdoses whereas they were present in less than a third of nonfatal cocaine-involved overdoses (Figure 2).

Figure 2: Percent of Fatal¹ and Nonfatal^{2,3} Cocaine-Involved Overdoses with Opioids Present among Michigan Residents, 2019



1. 2019 Michigan Resident Death File

2. 2019 Michigan Resident Inpatient File, Michigan Health & Hospital Association

3. 2019 Michigan Resident Outpatient File, Michigan Health & Hospital Association

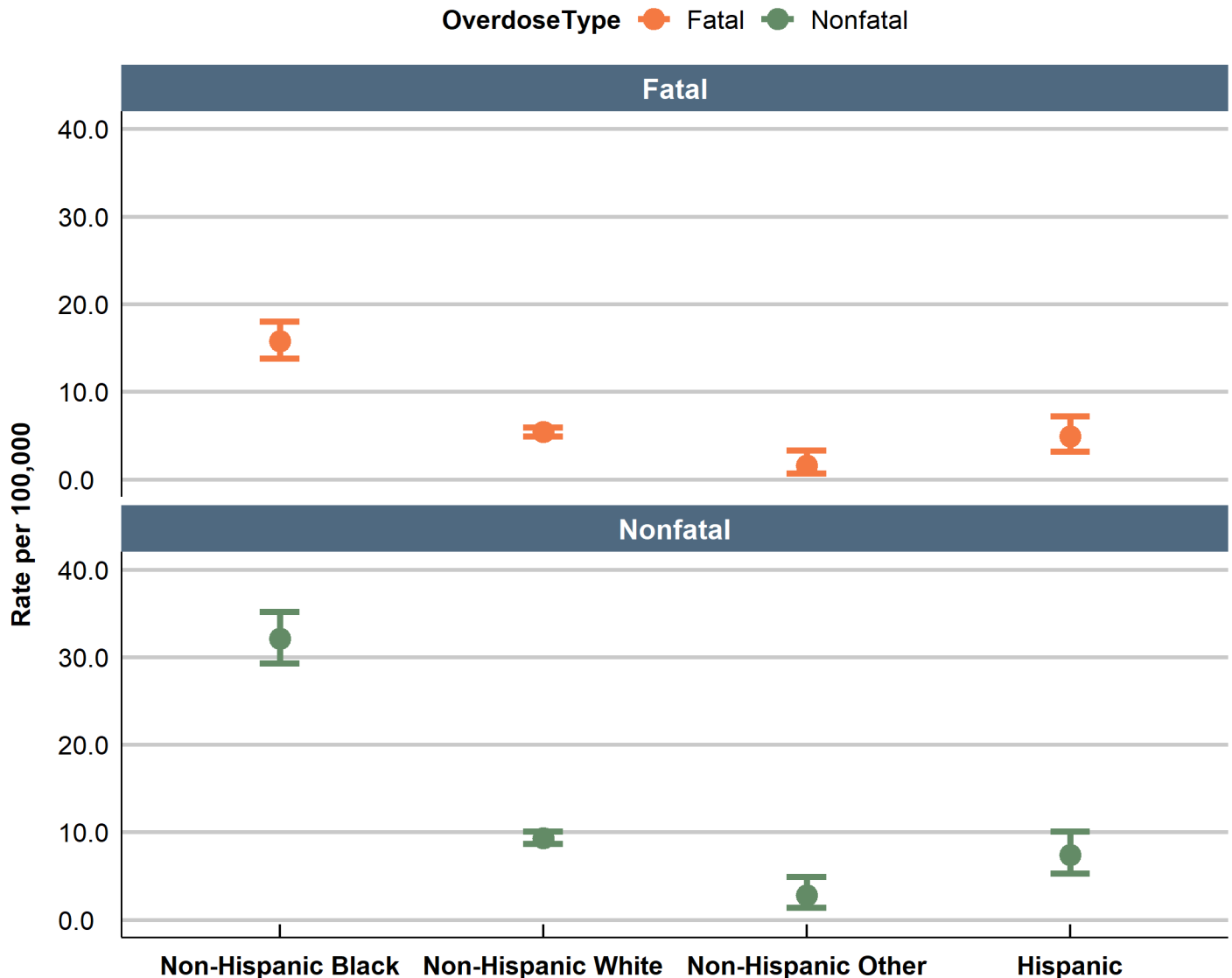
Notes: Nonfatal cocaine and opioid-involved drug overdoses (inpatient and emergency department treatment) include visits with any ICD-10-CM code of T40.5X(1-4)A and any ICD-10-CM code of T40.0-T40.4, T40.6 or T40.69 with a fourth character of 1-4 and a seventh character of "A".

Fatal cocaine and opioid-involved drug overdoses include deaths with an underlying cause of death of X40-X44, X60-X64, X85, or Y10-Y14 and contributing cause of death ICD-10 codes of T40.5 in combination with T40.0-T40.4 or T40.6.

Racial and Ethnic Disparities

Black Michigan residents had by far the highest rates of both fatal and nonfatal cocaine-involved overdoses (Figure 3). The nonfatal cocaine-involved overdose rate was higher than the fatal overdose rate among all racial groups, although not significantly higher for Hispanic and non-Hispanic residents of “Other” race, which included Asian, Pacific Islander, American Indian, and Alaska Native Michigan residents. Rate and ethnicity information was missing in 26.5 percent of nonfatal cocaine-involved overdoses and 1.9 percent of fatal cocaine-involved overdoses.

Figure 3: Crude Rate (per 100,000) of Fatal¹ and Nonfatal^{2,3} Cocaine-Involved Overdoses by Race and Ethnicity among Michigan Residents, 2019⁴



1. 2019 Michigan Resident Death File

2. 2019 Michigan Resident Inpatient File, Michigan Health & Hospital Association

3. 2019 Michigan Resident Outpatient File, Michigan Health & Hospital Association

4. Vintage 2019 postcensal estimates of the resident population (July 1, 2010-July 1, 2019), National Center for Health Statistics. Intercensal estimates of the resident population (July 1, 2009), National Center for Health Statistics.

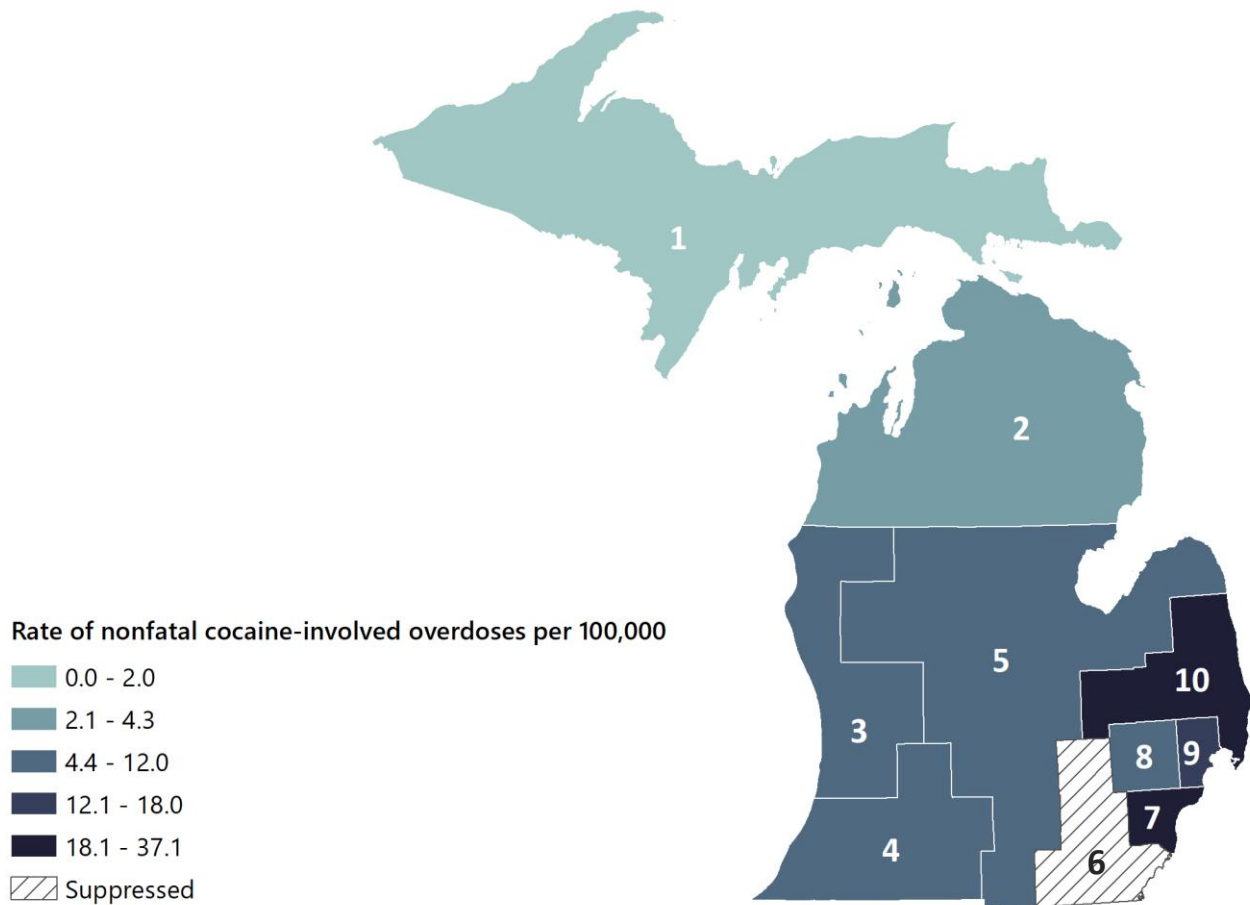
Notes: Nonfatal cocaine overdoses (inpatient and emergency department treatment) include visits with any ICD-10-CM code of T40.5X(1-4)A.

Fatal cocaine overdoses include deaths with an underlying cause of death of X40-X44, X60-X64, X85, or Y10-Y14 and contributing cause of death ICD-10 codes of T40.5. The figure above does not include 442 nonfatal and 13 fatal cocaine-involved overdoses among Michigan residents with an unknown race. Rates are displayed with the associated exact Poisson confidence intervals.

Geographic Patterns

Prepaid Inpatient Health Plan (PIHP) regions correspond to the service areas of the 10 organizations contracted by the Michigan Department of Health and Human Services to manage mental health services, including substance use disorder treatment for individuals enrolled in Medicaid. Figures 4 and 5 display the average annual rate of nonfatal cocaine-involved overdoses and fatal cocaine-involved overdoses by PIHP region of residence for 2018 and 2019. Both nonfatal and fatal cocaine-involved overdose rates were highest in Region 10 (Genesee, Lapeer, St. Clair, and Sanilac counties) and Region 7 (Wayne County). Region 1, which covers the Upper Peninsula, had the lowest rate of nonfatal cocaine-involved overdoses and Region 4 had the lowest rate of fatal cocaine-involved overdoses. Fatal overdose rates were not calculated when the number of overdoses was between one and five, due to statistical unreliability. Fatal rates were suppressed when the percent of all fatal drug overdoses without a specified drug exceeded 20 percent. Nonfatal rates were suppressed for regions that contained one or more hospitals with 100 or more beds that did not report inpatient or emergency department data.

Figure 4: Crude Rate (per 100,000) of Nonfatal^{1,2} Cocaine-Involved Overdoses by Prepaid Inpatient Health Plan Region of Residence, 2018-2019³



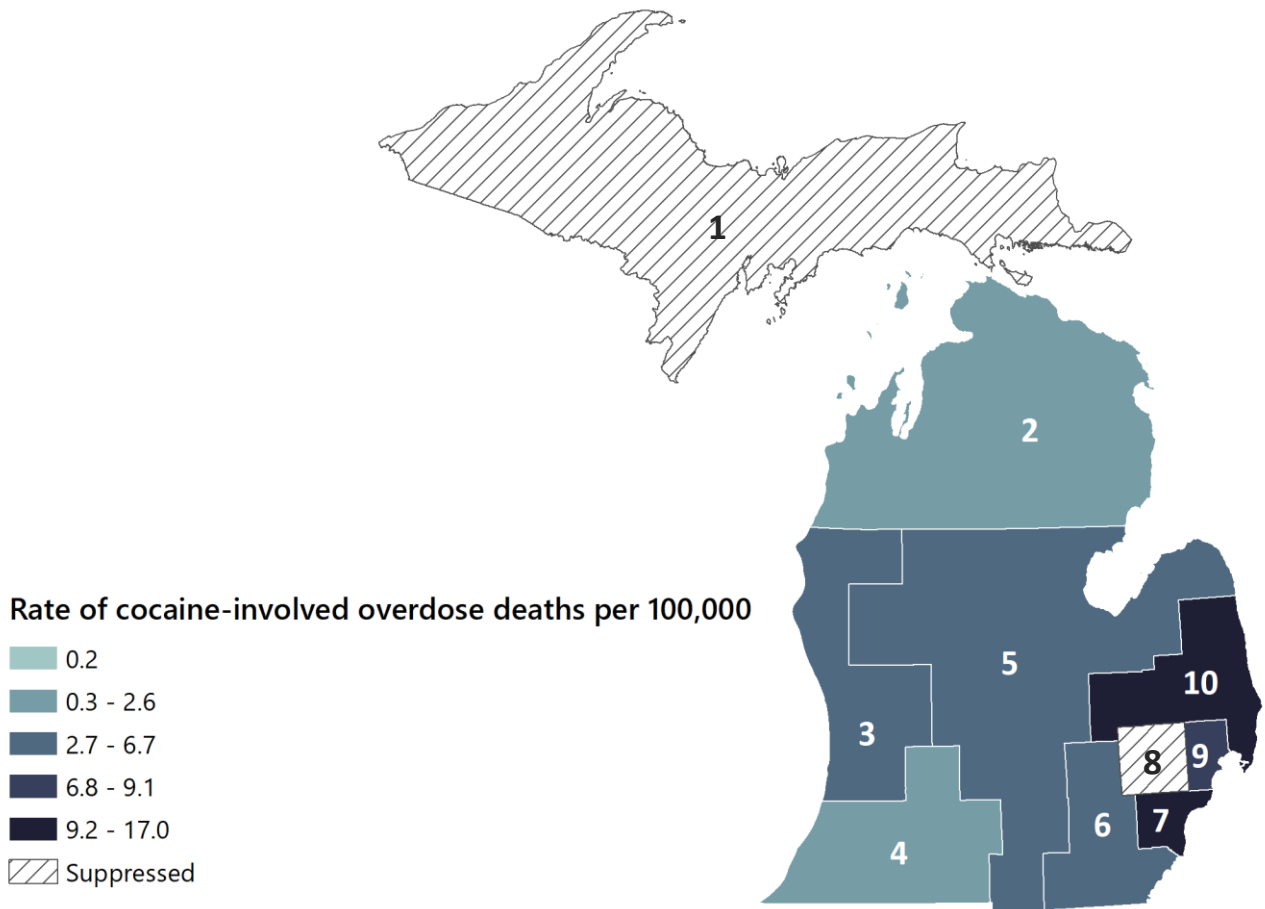
1. 2019 Michigan Resident Inpatient File, Michigan Health & Hospital Association

2. 2019 Michigan Resident Outpatient File, Michigan Health & Hospital Association

3. Vintage 2019 postcensal estimates of the resident population (July 1, 2010-July 1, 2019), National Center for Health Statistics. Intercensal estimates of the resident population (July 1, 2009), National Center for Health Statistics.

Notes: Nonfatal cocaine drug overdoses (inpatient and emergency department treatment) include visits with any ICD-10-CM code of T40.5X(1-4)A. Rates are suppressed for regions that contain hospitals with 100 or more beds that did not report data to the Michigan Inpatient Database or the Michigan Outpatient Database (Region 6). The map above does not include three nonfatal cocaine-involved overdoses with an unknown county of residence.

Figure 5: Crude Rate (per 100,000) of Cocaine-Involved Overdose Deaths¹ by Prepaid Inpatient Health Plan Region of Residence, 2018-2019²



1. 2019 Michigan Resident Death File

2. Vintage 2019 postcensal estimates of the resident population (July 1, 2010-July 1, 2019), National Center for Health Statistics. Intercensal estimates of the resident population (July 1, 2009), National Center for Health Statistics.

Notes: Fatal cocaine drug overdoses include deaths with an underlying cause of death of X40-X44, X60-X64, X85, or Y10-Y14 and contributing cause of death ICD-10 codes of T40.5. Rates are not calculated when the total number of cocaine-involved overdose deaths is between one and five due to statistical unreliability (Region 1) and rates are suppressed when the percent of all overdose deaths without a specified drug is greater than 20 percent (Region 8 and Region 1). The map above does not include five cocaine-involved overdose deaths with an unknown county of residence.

Technical Documentation

Data Sources

- 2016-2019 Michigan Inpatient Database (MIDB), Michigan Health & Hospital Association.
- 2018-2019 Michigan Outpatient Database (MODB), Michigan Health & Hospital Association.
- 2016-2019 Michigan Resident Death Files, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services.
- Vintage 2019 postcensal estimates of the resident population of the United States (April 1, 2010, July 1, 2010-July 1, 2019), by year, county, single-year of age, bridged race, Hispanic origin, and sex. National Center for Health Statistics. Prepared under a collaborative arrangement with the U.S. Census Bureau. Available from: http://www.cdc.gov/nchs/nvss/bridged_race.htm as of June 25, 2019.

Case Definitions

Nonfatal cocaine-involved overdoses include inpatient admissions of Michigan residents at acute-care hospitals with an ICD-10-CM code of T40.5 listed as a principal or any secondary diagnosis. Cocaine overdoses that also involved opioids included additional ICD-10-CM codes of T40.0-T40.4, T40.6, or T40.69. Subsequent and sequela visits and visits with a patient discharge disposition of 'expired' were not included.

Fatal cocaine-involved overdoses include deaths of Michigan residents, including deaths that occurred outside Michigan, with an underlying cause of death listed as an overdose (ICD-10 codes X40-X44, X60-X64, X85, Y10-Y14) and a contributing cause of death ICD-10 code of T40.5. Fatal cocaine-involved overdoses that also involved opioids were identified by an additional contributing cause of death ICD-10 code of T40.0-T40.4 or T40.6.

Inpatient Admission and Emergency Department Visit Data Notes

The MIDB and MODB include data collected from hospitals that are members of the Michigan Health and Hospital Association. A total of 128 Michigan acute-care hospitals reported inpatient data each year from 2016 through 2019, representing 92.8 percent of all acute-care hospitals in the State of Michigan. A total of 138 Michigan acute-care hospitals and free-standing emergency department centers reported emergency department data for 2018 and 2019, representing 97.9 percent of all acute-care hospitals and emergency department centers in the State of Michigan. Individuals who have been treated in the emergency department or admitted for inpatient care multiple times in a year will be represented more than once in the MIDB and MODB.

Mortality Data Notes

Fatal cocaine-involved overdoses may be underestimated if the medical examiner who investigates the death does not indicate which specific drugs were responsible for the death on the death certificate. From 2016 through 2019, the percent of drug overdose deaths within each PIHP region that did not include a specified drug ranged from 0.1 percent to 60.6 percent. To reduce potential bias, region-level data are suppressed when the percent of drug overdose deaths without a specific drug indicated on the death certificate exceeds 20.0 percent.

Statistical Notes

The rates presented in this document are crude rates and are calculated by dividing the total number of events (i.e., fatal or nonfatal cocaine-involved overdoses) by the number of individuals in the corresponding category and multiplying the result by 100,000. The Chi-Square Test of Association was used to evaluate if differences in the prevalence of opioid involvement significantly differed by overdose outcome. Confidence intervals for rates shown on Figure 3 were calculated using the Poisson distribution. Rates were not calculated when the number of events was between one and five due to statistical unreliability.