

DRUG OVERDOSE DEATHS IN MISSISSIPPI, 2011-2017



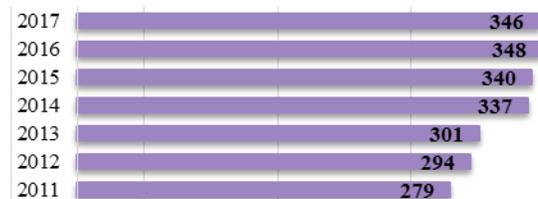
Epidemiological Report
1/22/2019

KEY FINDINGS

- On average in 2017, a person died nearly every day in Mississippi from a drug overdose.
- The total number of drug overdose deaths declined very slightly from 348 in 2016 to 346 in 2017.
- At the same time, however, the number of deaths involving fentanyl, heroin, amphetamines, cocaine, and benzodiazepines increased—as did deaths resulting from multiple drug use.
- In terms of race, the overwhelming majority of drug-related fatalities during 2011-2017 occurred among Caucasians (88.0%). These individuals also tended to be single (68.9%) and the vast majority had low levels of educational attainment (89.9%).
- All of Mississippi's counties, except for one (Jefferson) reported drug overdose deaths from 2011 to 2017.

OVERVIEW OF DRUG OVERDOSE DEATHS: During 2017, there were 346 drug overdose deaths reported in Mississippi, which was 2 deaths less compared to 2016 (Figure 1). This is an increase, however, of 24.0% compared to 2011. Since the change in the number of deaths was minuscule, the age-adjusted rate remained identical in 2016 and 2017: 11.9 deaths per 100,000 standard population. The 2016 and 2017 rate represents an increase of 20.2% from the 2011 rate of 9.9.

Figure 1. All Drug Overdose Deaths in MS, 2011-2017



OVERDOSE DEATHS BY TYPE OF DRUG INVOLVED, 2017: Opioids, including prescription opioids, fentanyl, heroin, and methadone, were involved in 180 (52.0%) cases. Benzodiazepines were recorded in one fifth (70 or 20.2%), psychostimulants with abusive potential (e.g., methamphetamine or prescription amphetamine-related drugs) in 18.2% (63 cases), and cocaine in 10.1% (35 cases) of all drug overdose deaths (Table 1).

MORTALITY TRENDS, 2011-2017: Deaths involving psychostimulants demonstrated the highest spike of 3,050.0%, from 2 deaths in 2011 to 63 deaths in 2017 (Table 1, Figure 2). During the same period, deaths involving opioids increased by 136.8%, deaths involving cocaine by 133.3%, and deaths involving benzodiazepines by 66.7%. From 2016 to 2017, deaths involving psychostimulants showed the highest increase (10.5%). Fatalities with no drug recorded on the death certificate decreased from 150 (53.8% of all cases) in 2011 to 66 (19.1% of all cases) in 2017. Although this is a significant improvement of data categorization, still nearly one out of five drug-related fatalities did not have any specific drug recorded in 2017.

Figure 2. Overdose Deaths by Drug Type in MS, 2011-2017

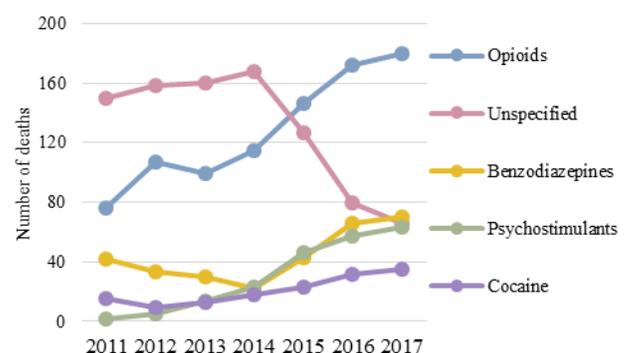


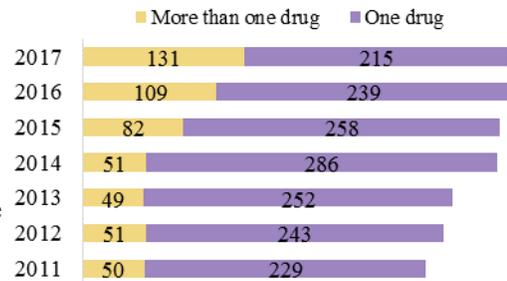
Table 1. Drug overdose deaths by category of involved drugs in MS, 2011-2017 (drug categories are not mutually exclusive and cannot be summed)

Type of drug	2011	2012	2013	2014	2015	2016	2017	Change 2016-2017 (deaths)	Change 2011-2017 (deaths)
Opioids	76	107	99	115	146	172	180	+4.7% (+8)	+136.8% (+104)
Unspecified	150	158	160	168	127	80	66	-17.5% (-14)	-56.0% (-84)
Benzodiazepines	42	33	30	22	43	66	70	+6.1% (+4)	+66.7% (+28)
Psychostimulants	2	5	14	23	46	57	63	+10.5% (+6)	+3,050.0% (+61)
Cocaine	15	9	13	18	23	32	35	+9.4% (+3)	+133.3% (+20)

CHARACTERISTICS

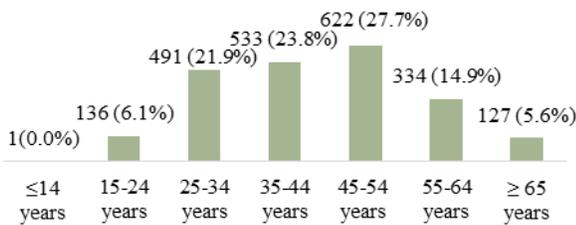
- **Manner of death:** From 2011 to 2017, there were a total of 2,245 drug overdose deaths. Most of these deaths (1,943 or 86.5%) were unintentional; however, 186 cases (8.3%) were due to suicide, 2 (0.1%) were homicides, and the intention in 114 cases (5.1%) was not determined.
- **Multiple drug use:** During 2017, more than one drug was recorded in 131 (37.9%) of all cases (Figure 3). The number of multidrug overdose deaths was stable until 2014; however, these deaths more than doubled between 2014 and 2017. Such deaths increased by 20.2% between 2016 and 2017 and by 162.0% between 2011 and 2017. The following substances were included in this analysis: opioids, psychostimulants, cocaine, cannabis, hallucinogens, benzodiazepines and other sedatives.

Figure 3. Overdose Deaths Involving Multiple Drugs in MS, 2011-2017



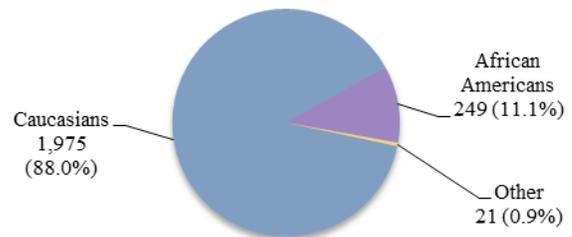
DEMOGRAPHICS: Between 2011 and 2017, the age group of 45-54 years had the highest occurrence of drug overdose deaths, followed by the age group of 35-44 years (Figure 4). Men accounted for 1,255 or 55.9% of the total deaths. The overwhelming majority of deaths (1,975 or 88.0%) occurred among Caucasians during the 2011-2017 period (Figure 5). In 2017, Caucasians had nearly four times higher age-adjusted mortality rates due to drug overdose than African Americans: 17.4 deaths versus 4.2 deaths per 100,000 standard population.

Figure 4. Age Distribution: Drug Overdose Deaths in MS, 2011-2017



Note: One death with unknownage was excluded from this analysis.

Figure 5. Racial Distribution: Drug Overdose Deaths in MS, 2011-2017



EDUCATIONAL AND MARITAL STATUS, 2011-2017: Education and family relations are some of the important social determinants of health. To illustrate how these factors are implicated in Mississippi’s overdose deaths, we stratified the data by educational levels and marital status.

Education: Only 172 (8.8%) of all decedents from opioid overdoses had a college degree or higher level of education. This finding may reflect Mississippi’s poor educational rankings. In 2017, only 21.3% of the state population ≥ 25 years had a college education, which was 9.6 percentage points below the national average of 30.9%. Investing in Mississippi’s system of higher education and improving educational performance, therefore, may be important steps for increasing the well-being of state residents and preventing drug addiction and deaths.

Marital Status: Less than one third (680 cases or 30.3%) of all decedents were married or not separated at the time of their death. Researching and implementing strategies to combat social isolation may help to provide essential social support to persons with opioid addiction.

Table 2. Number and percent of drug overdose deaths in MS

Educational level, 2012-2017*	Number of deaths	Percent of deaths	Percent of MS population**
8th grade or less	104	5.3%	5.6%
9th - 12th grade, no diploma	355	18.1%	11.0%
High school graduate or GED	788	40.1%	30.4%
Some college, no degree	349	17.7%	22.6%
Associate degree	171	8.7%	9.1%
Bachelor's degree	125	6.4%	13.3%
Graduate or professional degree	47	2.4%	8.0%
Unknown	27	1.3%	-
Marital status, 2011-2017	Number of deaths	Percent of deaths	Percent of MS population***
Married	680	30.3%	44.8%
Married, but separated	42	1.9%	3.0%
Widowed	134	6.0%	7.0%
Divorced	683	30.4%	11.7%
Never married	686	30.6%	33.6%
Unknown	20	0.8%	-

*For educational level only data for 2012-2017 are available (1,966 total drug overdose deaths)

**Source: U.S. Census Bureau, 2017 American Community Survey 5-Year Estimates

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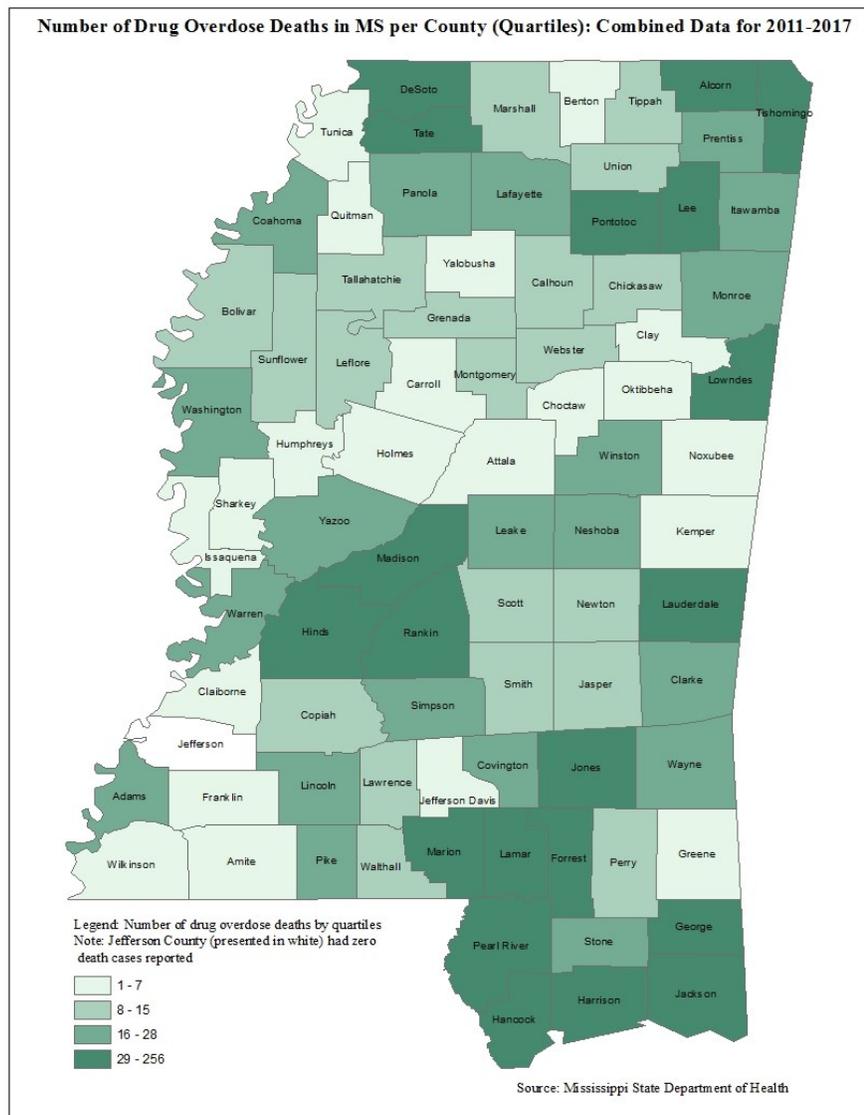
GEOGRAPHIC DISTRIBUTION OF DRUG OVERDOSE DEATHS IN MISSISSIPPI, 2011-2017: Although all counties may be at risk for drug overdoses, the vast majority of Mississippi’s 82 counties are sparsely populated. As a result of their small population size, many of these counties have reported a correspondingly small number of overdose-related death events. This low number of reported incidents complicates the task of calculating reliable overdose death rates, which requires a minimum number of at least 20 cases. To address this challenge, we combined data from 2011 through 2017. After aggregating our data longitudinally, 31 counties reported 20 or more overdose-related death cases during the study period. Displayed in Table 3 are the county-specific rates and absolute number of deaths for the 31 Mississippi counties that had 20 or more drug overdose deaths during the study period.

To evaluate the geographic distribution of overdose fatalities, we used two metrics: the average (mean) number of deaths per county and the statewide rate of overdose fatalities. On average between 2011 and 2017, there were 27 fatal drug overdoses per county and the statewide overdose fatality rate was 10.7 deaths per 100,000 population. Based on this analysis, counties with a higher than average number and rate of overdose deaths were identified as “geographical hot spots.” These counties are marked with an asterisk in Table 3.

This analytical approach revealed three geographical clusters with a high concentration of overdose deaths: the southern region of the state (Pearl River, Hancock, Harrison, Jackson, George, Marion, and Lamar); a cluster of three counties adjacent to Memphis, TN (DeSoto, Tate, and Panola), and the state’s northeastern corner (Tishomingo and Alcorn). Rankin County (near the state capital) and Pontotoc County (part of Tupelo area) were also among the counties in the state with a high concentration of overdose-related deaths.

Table 3. Counties with twenty or more drug overdose deaths in MS, 2011-2017: Ranked by rate per 100,000 population

County	Rate	No of deaths
Pearl River*	26.2	101
Hancock*	23.7	76
Tishomingo*	23.4	32
Marion*	22.2	40
Jackson*	18.6	183
Harrison*	18.5	256
Wayne	18.1	26
George*	17.7	29
Itawamba	16.5	27
Winston	16.1	21
Pontotoc*	15.8	34
Tate*	15.6	31
Alcorn*	15.3	40
Coahoma	14.5	25
Neshoba	13.1	27
Desoto*	13.0	156
Rankin*	12.7	132
Lamar*	12.7	53
Prentiss	11.8	21
Panola*	11.7	28
Yazoo	11.3	22
Lincoln	9.1	22
Jones	9.0	43
Lee	8.8	52
Forrest	8.8	47
Monroe	8.7	22
Lowndes	8.2	34
Pike	7.2	20
Madison	6.7	47
Lauderdale	6.3	35
Hinds	6.2	106



OVERVIEW OF OVERDOSE DEATHS INVOLVING OPIOIDS: During 2017, there were 180 opioid-related deaths in Mississippi. The age-adjusted death rate in 2017 was 6.3 deaths per 100,000 standard population, an increase of 125.0% from the 2011 rate of 2.8. From 2011 through 2017, there were a total of 895 opioid-related deaths and most of these deaths (809 or 90.4%) were unintentional; however 43 cases (4.8%) were due to suicides and there was one case of homicide. The manner of death remained undetermined for the rest of the cases. Caucasian race was reported in 813 cases (90.8%) and male gender in 515 (57.5%) of all opioid-related fatalities.

MULTIPLE DRUG USE

Two or more opioids: The concomitant use of at least two different opioids was recorded in 20 opioid-related deaths (11.6%) during 2016. Deaths involving two or more opioids further increased to 36 cases (20.0%) in 2017 - one out of every five opioid-related deaths reported statewide.

Opioids and other drugs of abuse: Similarly, deaths involving the simultaneous use of opioids and non-opioids increased in Mississippi. In 2016, for example, half of all opioid-related overdose deaths (50.6% or 87 cases) had a coexisting non-opioid drug of abuse listed in the death certificate. In 2017, 100 out of the total 180 opioid-related overdose deaths (55.6%) had another non-opioid drug recorded. The following substances were included in this analysis: psychostimulants, cocaine, cannabis, hallucinogens, benzodiazepines and other sedatives.

OPIOID DEATHS BY TYPE OF OPIOID INVOLVED

During 2017

- Natural or semisynthetic opioids such as hydrocodone and oxycodone were involved in 85 cases (47.2%).
- Synthetic opioids, including illicit or prescription fentanyl, were documented in 75 deaths (41.7%).
- Heroin was recorded in 33 deaths (18.3%).
- Methadone, a medication used mostly for treatment of opioid addiction, was recorded in 9 deaths.

Mortality Trends

- Deaths involving natural or semisynthetic opioids, a category that includes prescription opioid medications, increased, from 49 deaths in 2011 to 85 deaths in 2017. This trend reversed after 2016, however; the prescription opioid-involved deaths declined by 13 cases, from 98 cases in 2016 to 85 cases in 2017.
- Deaths due to synthetic opioids more than quadrupled in seven years, from 16 deaths in 2011 to 75 deaths in 2017. This increase was especially pronounced during the last two years of the time-series analysis: the number of synthetic opioid deaths almost doubled, from 41 in 2016 to 75 in 2017.
- The number of heroin overdose deaths demonstrated a steep and steady increase from 2011 until 2015. Then, heroin deaths decreased by 7 cases from 2015 to 2016, but this was a temporary dip in the number of reported cases. Heroin deaths increased by 5 cases during the last two years of the study period (Figure 6 and Table 4).

Figure 6. Drug Overdose Deaths Involving Opioids in MS, 2011-2017

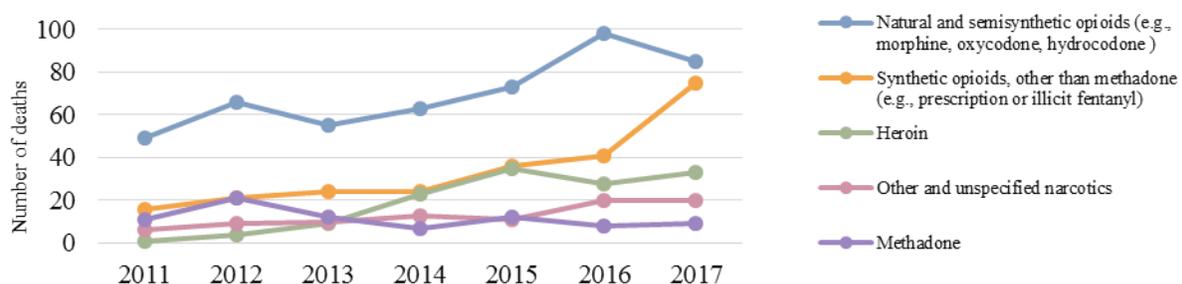


Table 4. Overdose deaths involving opioids in MS, 2011-2017 (drug categories are not mutually exclusive and cannot be summed)

Type of opioid	2011	2012	2013	2014	2015	2016	2017	Change 2016-2017 (deaths)	Change 2011-2017 (deaths)
Natural and semisynthetic opioids	49	66	55	63	73	98	85	-13.3% (-13)	+73.5% (+36)
Synthetic opioids, other than methadone	16	21	24	24	36	41	75	+82.9% (+34)	+368.8% (+59)
Heroin	1	4	9	23	35	28	33	+17.9% (+5)	+3,200.0% (+32)
Methadone	11	21	12	7	12	8	9	+12.5% (+1)	-18.2% (-2)
Other and unspecified narcotics	6	9	10	13	11	20	20	0.0% (0)	+233.3% (+14)

CONCLUSIONS

Decline in the overall number of overdose deaths: Compared to 2016, the number of overdose deaths in Mississippi during 2017 declined by two cases, a minor but nonetheless positive change. At this point, it is hard to predict if this a temporary decline or a reversal of the long-term trend of increasing overdose mortality in our state. Similar trends, however, have been identified by national-level monitoring. For instance, provisional data from CDC indicates that overdose deaths have levelled off nationwide since the end of 2017.¹ Yet, this minor drop in the number of drug overdose deaths is not a reason for declaring a premature public health victory over the drug epidemic. Instead, this is an opportunity to evaluate the actions taken to confront the misuse of drugs in our state and scale up promising public health interventions. For example, are successful public health strategies such as increasing public awareness of the risks associated with opioid use, reducing opioid prescribing, and improving addiction treatment options and access to naloxone linked to the potential plateau in overdose deaths shown in the data? If so, the state should consider ratcheting up its investment in these efforts and extending their reach.

Emerging trends: During 2017, the overall stabilization in the number of drug overdose deaths in Mississippi was due to a decline in the number of overdose fatalities involving unspecified drugs and prescription opioids. At the same time, however, deaths involving synthetic opioids and multiple substances spiked. While encouraging, the overall downward trend in the statistical data masks the troubling reality that some categories of drugs such as synthetic opioids are increasing in their lethality, instead of decreasing. These statistics suggest that select groups of drugs are fueling this lethal epidemic in Mississippi.

Stratification of data by drug groups uncovered three important emerging trends. The first of these trends involves a dangerous increase in deaths involving fentanyl. From 2016 to 2017, deaths involving synthetic opioids (e.g., fentanyl) went up sharply with fatalities across the nation increasing by 46.6%.² Such fatalities spiked even more dramatically in Mississippi, however, with deaths increasing by 82.9% - a dynamic suggestive of a significant increase in the supply of and demand for illicitly manufactured fentanyl in our state.

The second trend involves an increase in overdose deaths involving psychostimulants. This trend is especially concerning because of the parallel growth in the number of amphetamine prescriptions statewide.³ Although coded mortality data do not differentiate between illicit and prescription psychostimulants, this evolving trend warrants careful evaluation and, if necessary, in-depth monitoring and oversight of amphetamine prescribing practices.

Lastly, a third emerging trend identified in this report is the rising number of multidrug overdose deaths. Since polysubstance use is associated with a high mortality risk, this trend is especially troubling.⁴ All of these findings underline the importance of a comprehensive drug surveillance system and thorough epidemiological reporting. More importantly, these emerging trends highlight the need for building a statewide prevention and treatment infrastructure capable of responding to shifting trends in drug use and abuse.

FROM DATA TO ACTION: The Mississippi State Department of Health (MSDH) has undertaken two major actions aimed at monitoring the drug epidemic and reducing its negative consequences through information dissemination and education. At the end of 2014, MSDH established the framework for creating a comprehensive drug abuse surveillance system. The goals of this system are to provide timely data reporting and in-depth epidemiological analyses. Currently, this system uses several major population data sources for reporting. In the beginning of 2017, MSDH initiated an educational campaign among Mississippi's medical community on the scope of the state's opioid epidemic, the latest opioid treatment guidelines, and prevention strategies.

For more information and to view reports, please visit: <http://HealthyMS.com/prescriptionabuse>

Data Analysis: The data for this report were obtained from the Office of Vital Records at the Mississippi State Department of Health. Only Mississippi residents were included in the analyses. Drug overdose deaths were identified by International Classification of Diseases, Tenth Revision (ICD-10) underlying cause-of-death codes: X40-44 (accidental drug poisoning), X60-X64 (intentional self-drug poisoning), X85 (assault by drug poisoning), Y10-Y14 (drug poisoning by undetermined intent). Specific drug categories and multidrug use was identified by: T40.0-T40.4, and T40.6 (opioids), cocaine (T40.5), T40.7 (cannabis), T40.8 (lysergide), T40.9 (other and unspecified psychodysleptics), T43. 6 (psychostimulants with abuse potential), T42.2-42.8 (antiepileptic, sedative-hypnotic and antiparkinsonism), and T50.9 (unspecified). Age-adjusted death rates were calculated using the direct method and adjusted to the 2000 U. S. population.

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