



# Drug Overdose Deaths in Michigan 2016-2017

March 2019

# Drug Overdose Deaths in Michigan, 2016-2017

## Key Findings: Data from the Michigan Death Certificates File

- In 2017, there were 2,686 drug overdose deaths in Michigan.
- The age-adjusted rate of drug overdose deaths in 2017 (27.7 per 100,000) was 12.1% higher than the rate in 2016 (24.7 per 100,000).
- Drug overdose death rates were higher for males than for females in 2017 (35.2 vs 20.2 per 100,000). From 2016 to 2017, overdose rate for men increased by 10.0% (from 32.0 to 35.2 per 100,000), while the rate for females increased by 16.1% (from 17.4 to 20.2 per 100,000).
- Adults aged 25-34, 35-44, and 45-54 had higher rates of drug overdose deaths in 2017 than those aged 15-24, 55-64, and 65 and over.
- American Indians had the highest drug overdose death rate in 2017 (42.4 per 100,000) compared to blacks (30.9 per 100,000) and whites (28.2 per 100,000).
- The age-adjusted rate of drug overdose deaths involving synthetic opioids (drugs such as fentanyl, fentanyl analogs, and tramadol) increased by 48.5% between 2016 and 2017 (from 9.9 to 14.7 per 100,000).
- The significant rate increases occurred among deaths involving cocaine (28.3%) and synthetic opioids (48.5%), likely contributing to increases in drug overdose deaths.

Michigan Department of Health and Human Services  
Behavioral Health and Developmental Disabilities Administration  
Bureau of Community Based Services  
Office of Recovery Oriented Systems of Care

## Summary

In 2017, 2,686 drug overdose deaths occurred in Michigan. The age-adjusted rate of overdose deaths increased significantly from 24.7 in 2016 to 27.7 in 2017. From 2016 to 2017, overdose death rates increased for males and females, whites, blacks, and among males aged 45-64. The largest relative rate change occurred among blacks (33.2%) (Table 1).

Opioids were involved in 2,053 (76.4%) drug overdose deaths (21.4 per 100,000 population) in 2017, representing a 13.8% rate increase from 2016. Significant rate increases occurred among whites, blacks and both sexes (Table 2). From 2016 to 2017, the synthetic opioids-involved death rate increased 48.5%. Deaths involving synthetic opioids increased in most subgroups including both sexes, most age groups, whites, and blacks. The largest relative change occurred among males 65 and older (129.9%), while the largest absolute rate increases occurred among males aged 25 to 44 (an increase of 13.6 per 100,000) (Table 4). Cocaine-involved overdose death rates increased 28.3% (from 5.3 to 6.8 per 100,000). Cocaine-involved deaths increased in females (43.8%), males (19.7%), and blacks (59.0%) (Table 6). Overdose rates involving heroin increased from 2016 to 2017 (Table 3) and prescription opioids decreased from 2016 to 2017 (Table 5), but changes were not significant.

From 2016 to 2017, several counties experienced significant increases in drug overdose death rates. Notable increases occurred in Kent (62.9%), Oakland (27.4%), and Macomb (23.3%) counties (Table 1). All opioid-involved overdose death rates increased significantly in three counties (Wayne, Macomb, and Kent) (Table 2). Kent and Wayne counties also experienced significant increases in deaths involving heroin, 110.8% and 25.4% respectively (Table 3). The rates of synthetic opioid-involved overdose deaths significantly increased in Kent (114.0%), Macomb (57.1%), and Wayne (35.7%) counties (Table 4). Other county rate changes from 2016 and 2017 were not significant.

**Table 1. Annual number and age-adjusted rate of drug overdose deaths<sup>1</sup>, by sex, age, race, and selected counties – Michigan, 2016-2017**

Decedent Characteristics	2016		2017		Change from 2016 to 2017 <sup>1</sup>	
	Number	Rate	Number	Rate	Difference of rates	% change in rate
<b>All</b>	2,378	24.7	2,686	27.7	3.0	12.1*
<b>Sex</b>						
Male	1,517	32.0	1,693	35.2	3.2	10.0*
Female	861	17.4	993	20.2	2.8	16.1*
<b>Age group (years)</b>						
15-24	188	13.6	202	14.8	1.2	8.8
25-34	618	49.7	695	54.8	5.1	10.3
35-44	520	44.9	575	49.7	4.8	10.7
45-54	545	40.4	605	45.7	5.3	13.1
55-64	397	28.5	464	33.1	4.6	16.1
65 and older	105	6.5	140	8.4	1.9	29.2
<b>Sex and age group (years)</b>						
<b>Male</b>						
15-24	135	19.1	126	18.1	-1.0	-5.2
25-44	772	64.2	834	68.5	4.3	6.7
45-64	551	41.0	645	48.4	7.4	18.0*
<b>Female</b>						
15-24	53	7.8	76	11.4	3.6	46.2
25-44	366	30.5	436	36.1	5.6	18.4
45-64	391	28.0	424	30.5	2.5	8.9
<b>Race</b>						
White	1,962	26.0	2,150	28.2	2.2	8.5*
Black	349	23.2	457	30.9	7.7	33.2*
American Indian	35	40.2	38	42.4	2.2	5.5
<b>Selected counties</b>						
Wayne	665	37.8	749	42.3	4.5	11.9
Macomb	319	36.9	394	45.5	8.6	23.3*
Oakland	141	11.3	180	14.4	3.1	27.4*
Genesee	137	35.6	161	43.4	7.8	21.9
Kent	80	12.4	130	20.2	7.8	62.9*
Ingham	74	29.0	73	25.6	-3.4	-11.7
St. Clair	74	50.0	67	44.8	-5.2	-10.4
Washtenaw	74	19.0	73	19.8	0.8	4.2
Monroe	55	38.7	59	42.6	3.9	10.1
Calhoun	48	38.2	46	38.6	0.4	1.0
Kalamazoo	62	25.9	54	21.2	-4.7	-18.1
Muskegon	37	22.7	40	26.5	3.8	16.7

**Table 2. Annual number and age-adjusted rate of drug overdose deaths involving all opioids<sup>2†</sup>, by sex, age, race, and selected counties – Michigan, 2016-2017**

Decedent Characteristics	2016		2017		Change from 2016 to 2017 <sup>¶</sup>	
	Number	Rate	Number	Rate	Difference of rates	% change in rate
<b>All</b>	1,788	18.8	2,053	21.4	2.6	13.8*
<b>Sex</b>						
Male	1,202	25.6	1,349	28.3	2.7	10.5*
Female	586	12.0	704	14.5	2.5	20.8*
<b>Age group (years)</b>						
15-24	152	11.0	160	11.7	0.7	6.7
25-34	503	40.5	579	45.6	5.2	12.7
35-44	411	35.5	458	39.6	4.1	11.6
45-54	385	28.6	437	33.0	4.5	15.7
55-64	279	20.0	335	23.9	3.9	19.5
65 and older	54	3.3	82	4.9	1.6	47.4
<b>Sex and age group (years)</b>						
<b>Male</b>						
15-24	108	15.3	100	14.3	-1.0	-6.3
25-44	640	53.2	704	57.8	4.6	8.7
45-64	417	31.1	493	37.0	5.9	18.9
<b>Female</b>						
15-24	44	6.5	60	9.0	2.5	38.5
25-44	274	22.9	333	27.6	4.7	20.4
45-64	247	17.7	279	20.1	2.4	13.4
<b>Race</b>						
White	1,461	19.7	1,640	21.9	2.2	11.2*
Black	276	18.2	353	23.7	5.5	30.2*
American Indian	25	28.7	26	29.8	1.1	3.8
<b>Selected counties</b>						
Wayne	538	30.6	636	36.1	5.5	18.0*
Macomb	262	30.6	320	37.5	6.9	22.5*
Oakland	§		§			
Genesee	120	31.8	131	35.3	3.5	11.0
Kent	64	9.9	102	15.9	6.0	60.6*
Ingham	66	25.9	63	21.9	-4.0	-15.4
St. Clair	56	39.2	50	35.9	-3.3	-8.4
Washtenaw	64	16.4	62	16.8	0.4	2.4
Monroe	43	31.4	48	35.0	3.6	11.5
Calhoun	41	33.1	44	36.8	3.7	11.2
Kalamazoo	54	22.6	44	17.0	-5.6	-24.8
Muskegon	33	20.1	34	23.0	2.9	14.4

**Table 3. Annual number and age-adjusted rate of drug overdose deaths involving heroin<sup>†</sup>, by sex, age, race, and selected counties – Michigan, 2016-2017**

Decedent Characteristics	2016		2017		Change from 2016 to 2017 <sup>¶</sup>	
	Number	Rate	Number	Rate	Difference of rates	% change in rate
<b>All</b>	732	7.6	786	8.2	0.6	7.9
<b>Sex</b>						
Male	527	11.1	559	11.6	0.5	4.5
Female	205	4.3	227	4.9	0.6	14.0
<b>Age group (years)</b>						
15-24	67	4.8	47	3.4	-1.4	-28.2
25-34	220	17.7	251	19.8	2.1	11.7
35-44	159	13.7	176	15.2	1.5	11.1
45-54	151	11.2	164	12.4	1.2	10.7
55-64	114	8.2	123	8.8	0.6	7.1
65 and older	21	1.3	25	1.5	0.2	15.3
<b>Sex and age group (years)</b>						
<b>Male</b>						
15-24	43	6.1	28	4.0	-2.1	-34.2
25-44	276	22.9	299	24.6	1.7	7.3
45-64	190	14.2	212	15.9	1.7	12.0
<b>Female</b>						
15-24	24	3.6	19	2.9	-0.7	-20.8
25-44	103	8.6	128	10.6	2.0	23.2
45-64	75	5.4	75	5.4	0.0	0.0
<b>Race</b>						
White	584	7.9	607	8.3	0.4	5.1
Black	131	8.7	161	10.7	2.0	23.0
American Indian	§§		§§			
<b>Selected counties</b>						
Wayne	235	13.0	288	16.3	3.3	25.4*
Macomb	133	15.5	113	13.1	-2.4	-15.5
Oakland	§		§			
Genesee	47	12.8	53	14.9	2.1	16.4
Kent	25	3.7	49	7.8	4.1	110.8*
Ingham	21	8.1	19			
St. Clair	31	21.2	28	20.3	-0.9	-4.2
Washtenaw	35	8.6	32	9.0	0.4	4.7
Monroe	15		18			
Calhoun	15		18			
Kalamazoo	20		§§			
Muskegon	14		§§			

**Table 4. Annual number and age-adjusted rate of drug overdose deaths involving synthetic opioids other than methadone<sup>†</sup>, by sex, age, race, and selected counties – Michigan, 2016-2017**

Decedent Characteristics	2016		2017		Change from 2016 to 2017 <sup>¶</sup>	
	Number	Rate	Number	Rate	Difference of rates	% change in rate
<b>All</b>	930	9.9	1399	14.7	4.8	48.5*
<b>Sex</b>						
Male	661	14.2	973	20.6	6.4	45.1*
Female	269	5.7	426	8.9	3.2	56.1*
<b>Age group (years)</b>						
15-24	91	6.6	114	8.4	1.8	26.6
25-34	287	23.1	432	34.0	10.9	47.4*
35-44	217	18.7	316	27.3	8.6	46.2*
45-54	190	14.1	287	21.7	7.6	53.9*
55-64	125	9.0	203	14.5	5.5	61.1*
65 and older	20	1.2	46	2.8	1.6	129.9*
<b>Sex and age group (years)</b>						
<b>Male</b>						
15-24	65	9.2	70	10.0	0.8	9.1
25-44	363	30.2	533	43.8	13.6	45.0*
45-64	216	16.1	336	25.2	9.1	56.5*
<b>Female</b>						
15-24	26	3.8	44	6.6	2.8	73.7
25-44	141	11.8	215	17.8	6.0	50.9*
45-64	99	7.1	154	11.1	4.0	56.1*
<b>Race</b>						
White	741	10.3	1084	14.8	4.5	43.7*
Black	164	10.8	272	18.2	7.4	68.5*
American Indian	14		18			
<b>Selected counties</b>						
Wayne	341	19.6	469	26.6	7.0	35.7*
Macomb	146	17.7	232	27.8	10.1	57.1*
Oakland	§		§			
Genesee	60	16.6	93	25.6	9.0	54.2
Kent	28	4.3	58	9.2	4.9	114.0*
Ingham	28	10.9	33	12.1	1.2	11.0
St. Clair	31	21.7	31	21.9	0.2	0.9
Washtenaw	38	9.9	44	12.0	2.1	21.2
Monroe	25	17.9	33	25.3	7.4	41.3
Calhoun	12		36	29.6		
Kalamazoo	20	8.9	28	10.8	1.9	21.3
Muskegon	§§		17			

**Table 5. Annual number and age-adjusted rate of drug overdose deaths involving prescription opioids<sup>3†</sup>, by sex, age, race, and selected counties – Michigan, 2016-2017**

Decedent Characteristics	2016		2017		Change from 2016 to 2017 <sup>¶</sup>	
	Number	Rate	Number	Rate	Difference of rates	% change in rate
<b>All</b>	697	7.2	647	6.6	-0.6	-8.3
<b>Sex</b>						
Male	419	8.9	350	7.3	-1.6	-18.0
Female	278	5.6	297	6.0	0.4	7.1
<b>Age group (years)</b>						
15-24	45	3.3	36	2.6	-0.7	-20.0
25-34	159	12.8	152	12.0	-0.8	-6.4
35-44	164	14.2	147	12.7	-1.5	-10.4
45-54	166	12.3	144	10.9	-1.4	-11.5
55-64	135	9.7	130	9.3	-0.4	-4.3
65 and older	24	1.5	37	2.2	0.7	48.0
<b>Sex and age group (years)</b>						
<b>Male</b>						
15-24	34	4.8	21	3.0	-1.8	-37.3
25-44	207	17.2	169	13.9	-3.3	-19.3
45-64	163	12.1	143	10.7	-1.4	-11.4
<b>Female</b>						
15-24	11	1.6	15	2.3	0.7	40.6
25-44	116	9.7	130	10.8	1.1	11.0
45-64	138	9.9	131	9.4	-0.5	-4.8
<b>Race</b>						
White	589	7.7	566	7.3	-0.4	-5.2
Black	87	5.7	69	4.6	-1.1	-19.3
American Indian	12		§§			
<b>Selected counties</b>						
Wayne	157	8.8	153	8.7	-0.1	-1.1
Macomb	98	11.1	94	10.5	-0.6	-5.4
Oakland	§		§			
Genesee	60	15.2	52	13.1	-2.1	-13.8
Kent	26	4.0	27	4.0		0.0
Ingham	33	12.7	20	6.4	-6.3	-49.6
St. Clair	14		§§			
Washtenaw	13		13			
Monroe	14		12			
Calhoun	25	20.3	16			
Kalamazoo	30	12.8	20	7.3	-5.5	-43.0
Muskegon	18		18			



**Table 6. Annual number and age-adjusted rate of drug overdose deaths involving cocaine<sup>†</sup>, by sex, age, race, and selected counties – Michigan, 2016-2017**

Decedent Characteristics	2016		2017		Change from 2016 to 2017 <sup>¶</sup>	
	Number	Rate	Number	Rate	Difference of rates	% change in rate
<b>All</b>	504	5.3	651	6.8	1.5	28.3*
<b>Sex</b>						
Male	356	7.6	439	9.1	1.5	19.7*
Female	148	3.2	212	4.6	1.4	43.8*
<b>Age group (years)</b>						
15-24	29	2.1	36	2.6	0.5	25.7
25-34	133	10.7	162	12.8	2.1	19.3
35-44	123	10.6	155	13.4	2.8	26.5
45-54	134	9.9	178	13.5	3.6	36.0
55-64	73	5.2	101	7.2	2.0	38.7
65 and older	11	0.7	19	1.1	0.4	62.8
<b>Sex and age group (years)</b>						
<b>Male</b>						
15-24	20	2.8	20	2.9	0.1	2.4
25-44	178	14.8	208	17.1	2.3	15.5
45-64	149	11.1	195	14.6	3.5	31.8
<b>Female</b>						
15-24	§§	1.3	16	2.4	1.1	84.6
25-44	78	6.5	109	9.0	2.5	38.8
45-64	58	4.1	84	6.0	1.9	47.5
<b>Race</b>						
White	377	5.2	437	5.9	1.0	19.2
Black	113	7.8	174	12.2	4.6	59.0*
American Indian	§§		§§			
<b>Selected counties</b>						
Wayne	201	11.7	234	13.4	1.7	14.5
Macomb	63	7.2	77	8.7	1.5	20.8
Oakland	§		§			
Genesee	38	10.5	60	16.6	6.1	58.1
Kent	22	3.4	41	6.5	3.1	91.2
Ingham	16		19			
St. Clair	§§		11			
Washtenaw	21	5.7	20	5.5	-0.2	-3.5
Monroe	13		11			
Calhoun	10		14			
Kalamazoo	§§		§§			
Muskegon	§§		§§			

## Notes on Data

Source: Michigan Death Certificates, Division for Vital Statistics and Health Statistics, MDHHS

1. Deaths are classified using the International Classification of Diseases, Tenth Revision (ICD-10). Drug overdose deaths are identified using underlying cause-of-death codes X40-X44 (unintentional), X60-X64 (suicide), X85 (homicide), and Y10-Y14 (undetermined intent). Of the drug overdose deaths in 2017, 82.7% were unintentional, 6.6% were suicides, 10.6% were of undetermined intent, and less than 1% were homicides. Rates are age-adjusted using the direct method and the 2000 U.S. standard population, except age-specific crude rates. All rates are per 100,000 population. Cells with less than 9 deaths are not reported. Rates based on <20 are not considered reliable and not reported.
  2. Drug overdose deaths, as defined, that have opium (T40.0), heroin (T40.1), natural and semisynthetic opioids (T40.2), methadone (T40.3), synthetic opioids other than methadone (T40.4), or other and unspecified narcotics (T40.6) as a contributing cause.
  3. Drug overdose deaths, as defined, that have natural and semisynthetic opioids (T40.2) or methadone (T40.3) as a contributing cause.
- † Drug categories are not exclusive because deaths may involve more than one drug. Summing of categories will result in greater than the total number of deaths in a year.
- § Not reported due to higher percentage of drug overdose deaths with no drug specificity (58.2% in 2016 and 62.2% in 2017).
- §§ Cells with  $\leq 9$  deaths
- ¶ Percent change is the difference between 2016 and 2017 rates divided by the 2016 rate, multiplied by 100. Nonoverlapping confidence intervals were used if the number of deaths was <100 in 2016 or 2017, and z-tests were used if the number of deaths was  $\geq 100$  in both 2016 and 2017. Note that the method of comparing confidence intervals is a conservative method for statistical significance.
- \* Statistically significant at 0.05 level.

## Definitions

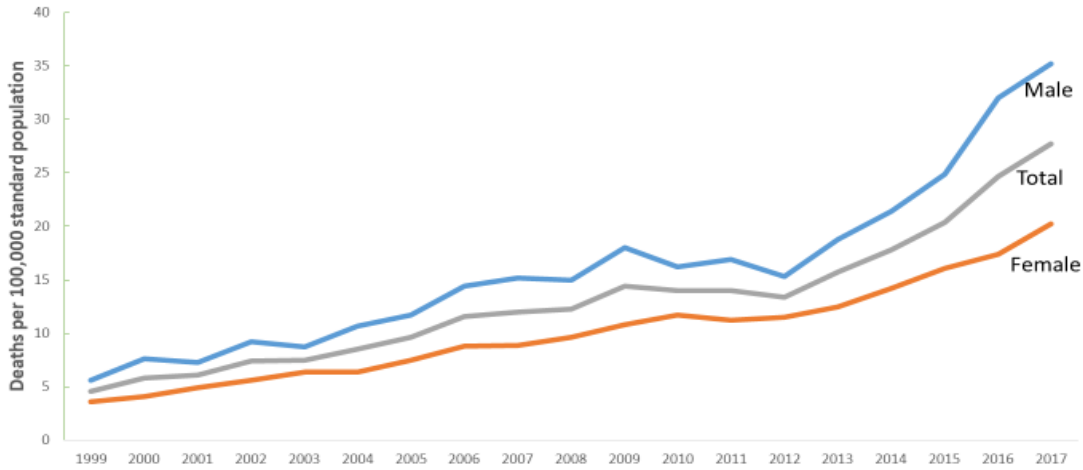
**Drug overdose deaths:** Includes deaths resulting from unintentional or intentional overdose of a drug, being given the wrong drug, taking a drug in error, or taking a drug inadvertently.

**Natural and semisynthetic opioids:** Includes such drugs as morphine, codeine, hydrocodone, and oxycodone.

**Synthetic opioids other than methadone:** Includes such drugs as fentanyl, fentanyl analogs, and tramadol.

## Appendix. Drug overdose deaths in Michigan, 1999-2017

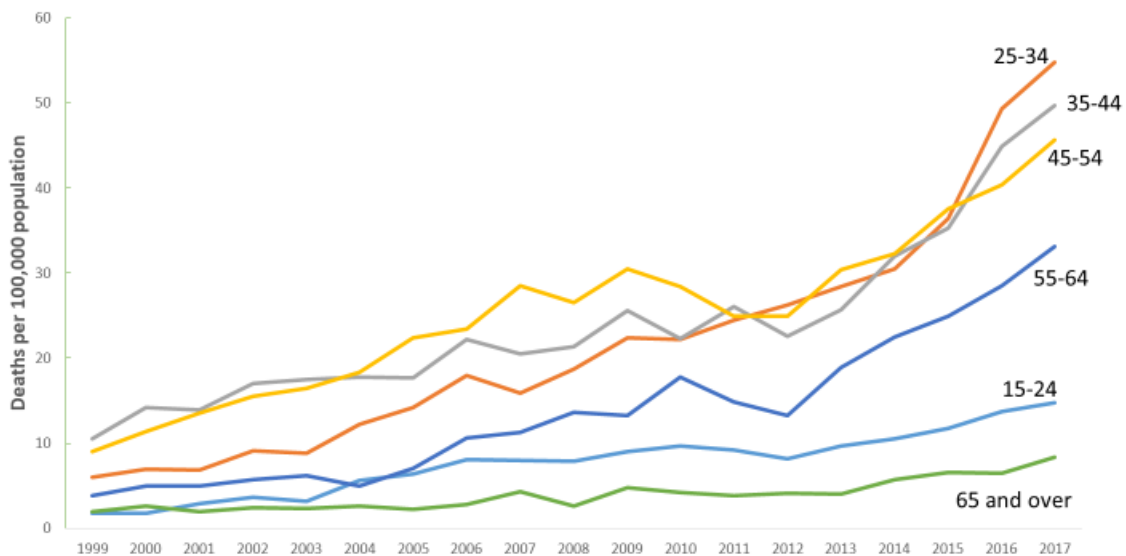
Figure 1. Age-adjusted drug overdose death rates - Michigan, 1999-2017



Source: Michigan Death Certificates, Division for Vital Records and Health Statistics/Michigan Department of Health and Human Services

- The age-adjusted rate of drug overdose deaths increased from 4.6 per 100,000 population in 1999 to 27.7 in 2017.
- For males, the rate increased from 5.6 in 1999 to 35.2 in 2017. For females, the rate increased from 3.6 in 1999 to 20.2 in 2017.

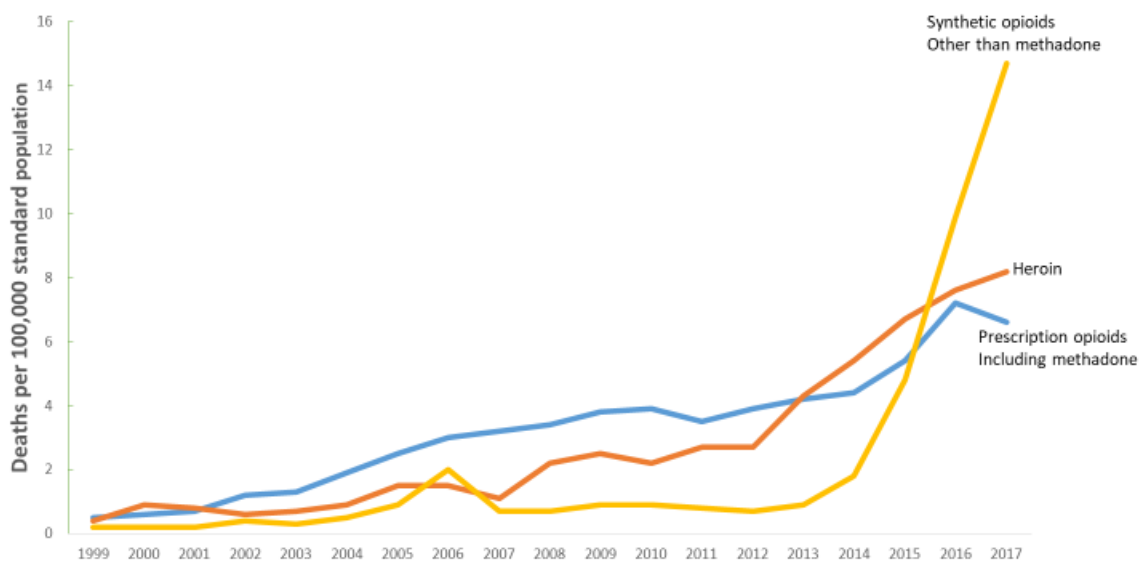
Figure 2. Drug overdose death rates by selected age group - Michigan, 1999-2017



Source: Michigan Death Certificates, Division for Vital Records and Health Statistics/Michigan Department of Health and Human Services

- The rates of drug overdose deaths increased from 1999 to 2017 for all age groups (Figure 2).
- From 1999 to 2017, the greatest percentage change in drug overdose rates occurred among adults aged 25-34, increasing from 6.0 per 100,000 in 1999 to 54.8 in 2017, a more than nine (9)-fold increase.

Figure 3. Age-adjusted drug overdose death rates by opioid category - Michigan, 1999-2017



Drug categories are not mutually exclusive.

Source: Michigan Death Certificates, Division for Vital Records and Health Statistics/Michigan Department of Health and Human Services

- The rate of drug overdose deaths involving synthetic opioids other than methadone, which include drugs such as fentanyl, fentanyl analogs, and tramadol, increased from 0.2 per 100,000 in 1999 to 0.9 in 2013, 1.8 in 2014, 4.8 in 2015, 9.9 in 2016, and 14.7 in 2017.
- The rate of drug overdose deaths involving heroin increased on average by 105% per year from 2013 through 2017.

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