Fentanyl and Related Drugs Like Carfentanil as well as Cocaine Drove Increase in Overdose Deaths

Ohio's opioid epidemic continued to evolve in 2016 to stronger drugs, driving an increase in unintentional overdose deaths. The data shows a significant increase in overdose deaths involving the opioid fentanyl, the emergence of more powerful fentanyl-related drugs like carfentanil, and indications that cocaine was used with fentanyl and other opiates. The data also shows some promising progress – the fewest unintentional overdose deaths involving prescription opioids since 2009 (excluding deaths involving fentanyl and related drugs).

Illegally produced fentanyl can be hundreds of times stronger than heroin, and carfentanil and other related drugs can be stronger than fentanyl.

In 2016, unintentional drug overdoses caused the deaths of 4,050 Ohio residents, a 32.8 percent increase compared to 2015 when there were 3,050 overdose deaths.

Fentanyl and related drugs were involved in 58.2 percent (2,357) of all unintentional drug overdose deaths in 2016. By comparison, fentanyl was involved in 37.9 percent (1,155) in 2015, 19.9 percent (503) in 2014, 4.0 percent (84) in 2013, and 3.9 percent (75) in 2012 (see Figures 1 and 2). With the emergence of carfentanil in 2016, the fentanyl-related drug was involved in 340 overdose deaths, most of them during the second half of the year. For males and females respectively, the largest number of fentanyl and related drug overdose deaths were among the 25-34 age group. (see Figure 3). The increase in fentanyl and carfentanil overdose deaths in 2016 corresponded with an increase in drug seizure reports by law enforcement (see Figure 4).

The number of cocaine-related overdose deaths rose significantly from 685 in 2015 to 1,109 in 2016 — a 61.9 percent increase (see Table 1). Of cocaine-related overdose deaths in 2016, 80.2 percent also involved an opiate, and 55.8 percent involved fentanyl and related opiates in particular.

The number of overdose deaths involving heroin remained relatively flat with 1,444 overdose deaths in 2016 compared to 1,424 in 2015 (see Table 1).

Figure 1. Number of Fentanyl and Related Drug Deaths and Percentage of Unintentional Overdose Deaths, by Year, Ohio, 2012-2016
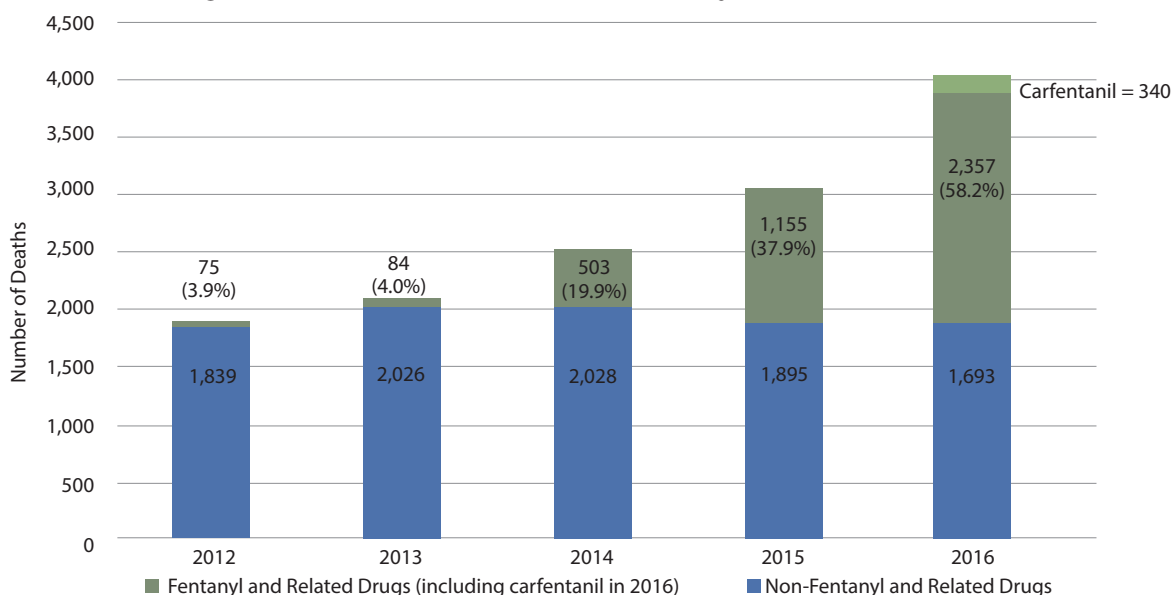
Source: Ohio Department of Health, Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Prevention Program.
Includes Ohio residents who died due to unintentional drug poisoning (underlying cause of death ICD-10 codes X40-X44).

Figure 2. Percentage of Unintentional Drug Overdose Deaths Involving Selected Drugs, by Year, 2010-2016
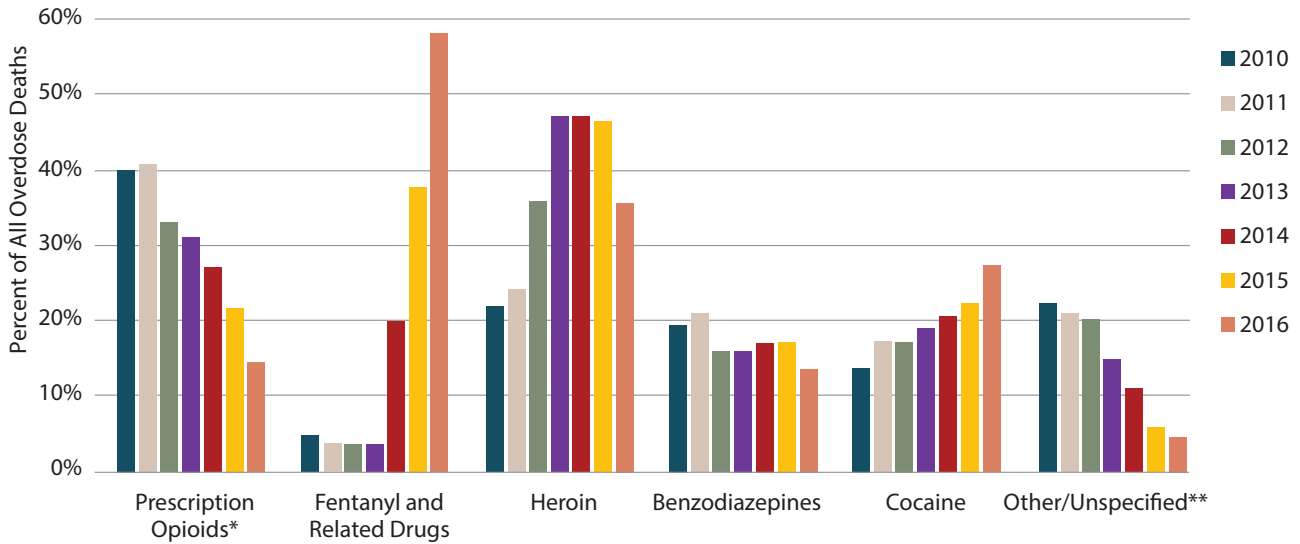
Source: Ohio Department of Health, Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Prevention Program.
Includes Ohio residents who died due to unintentional drug poisoning (underlying cause of death ICD-10 codes X40-X44).
* Excludes deaths involving fentanyl and related drugs.
** No specific drug was identified.

Figure 3: Fentanyl and Related Unintentional Overdose Deaths, by Age and Sex, Ohio, 2016

Source: Ohio Department of Health, Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Prevention Program.
Includes Ohio residents who died due to unintentional drug poisoning (underlying cause of death ICD-10 codes X40-X44).

Figure 4. Number of Fentanyl-Related Deaths and Reported Drug Seizures, Ohio, 2014-2016

Source: National Forensic Laboratory Information System provided by the State of Ohio Board of Pharmacy (data accessed 8-22-2017) an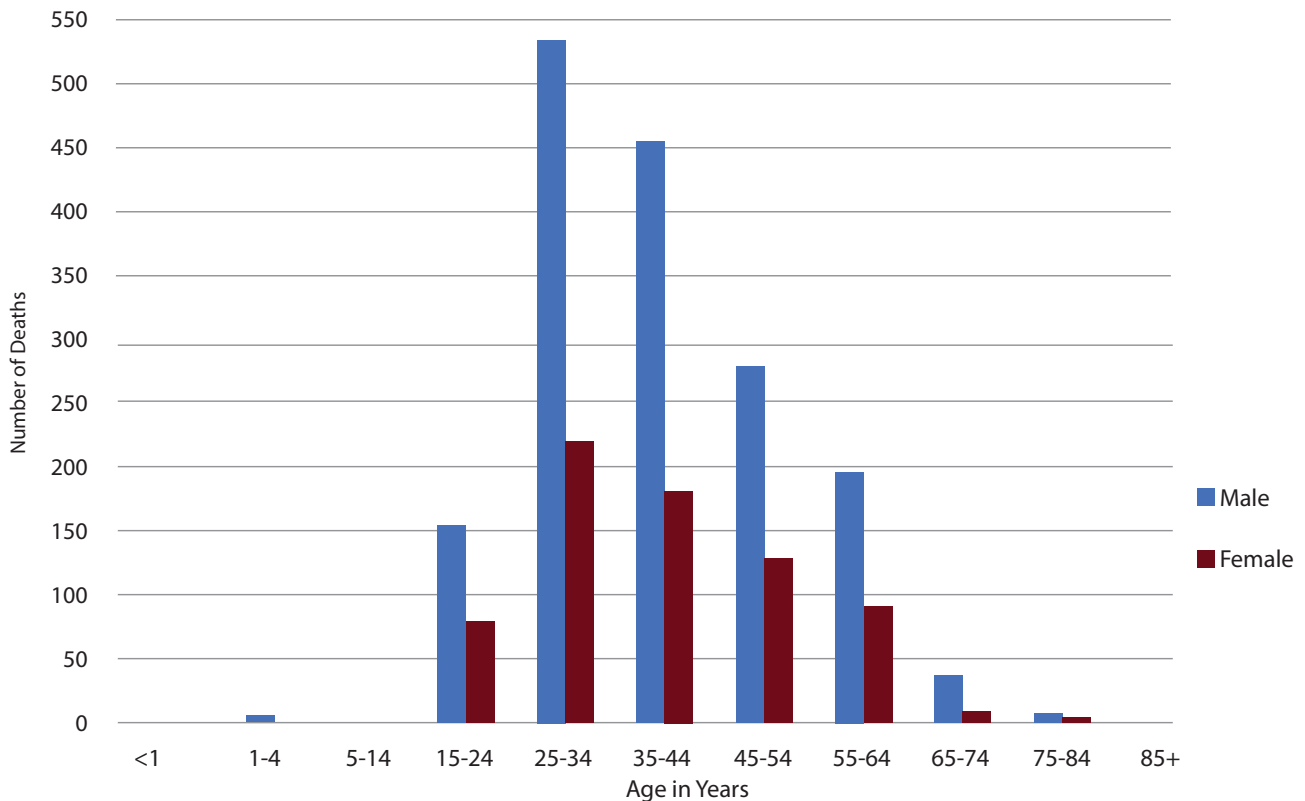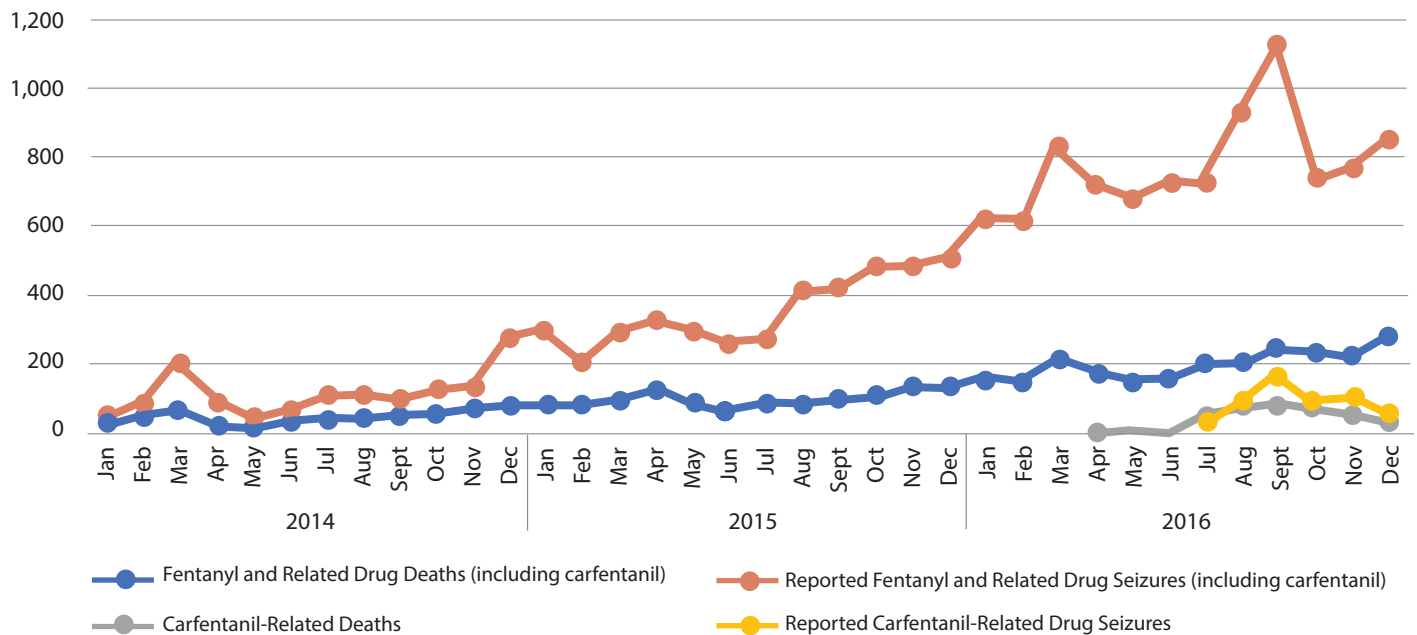d Ohio Department of Health, Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Prevention Program.
Includes Ohio residents who died due to unintentional drug poisoning (underlying cause of death ICD-10 codes X40-X44).

Unintentional Overdose Deaths Involving Prescription Opioids Continued to Decline

Combating prescription opioid abuse is important because prescription opioids are involved in a significant number of overdose deaths in Ohio, and abuse of them is a key risk factor for heroin and fentanyl use, according to the Centers for Disease Control and Prevention (CDC). Of all unintentional overdose deaths in Ohio in 2016, 834 (20.6 percent) had an opioid prescription in the previous 30 days.

Still, of all unintentional drug overdose deaths, the percentage of prescription opioid-related deaths in Ohio declined for a fifth straight year in 2016 (excluding deaths involving fentanyl and related drugs), and the number of these deaths declined 15.4 percent from 667 in 2015 to 564 in 2016 — the fewest since 2009 (see Figure 2 and Table 1).

This decline corresponded with Ohio's efforts to reduce the prescription opioid supply available for diversion and abuse through law enforcement efforts, working with medical professionals to establish opioid prescribing guidelines, and empowering prescribers and pharmacists to prevent opioid abuse using Ohio's prescription drug monitoring program, the Ohio Automated Rx Reporting System (OARRS). Doctors and other prescribers are required to check OARRS before prescribing an opioid or benzodiazepine to see what controlled substance medications a patient might already be taking. A May 2016 fact sheet from the American Medical Association showed that Ohio led the nation in prescription drug monitoring in 2016 when OARRS received more than 24 million queries from Ohio prescribers — far more than any other state. The number of OARRS queries in Ohio increased from 1.8 million in 2011 to 24.1 million in 2016 (see Figure 5).

Opioid prescribing in Ohio declined for a fourth consecutive year in 2016, according to the State of Ohio Board of Pharmacy (see Figure 6). Between 2012 and 2016, the total number of opioids dispensed to Ohio patients decreased by 162 million doses or 20.4 percent.

Figure 5. Prescriber OARRS Queries, Ohio, 2011-2016

Number of Queries in Millions

Year	Value
2011	1.8
2012	5.4
2013	7.4
2014	10.8
2015	16.5
2016	24.1
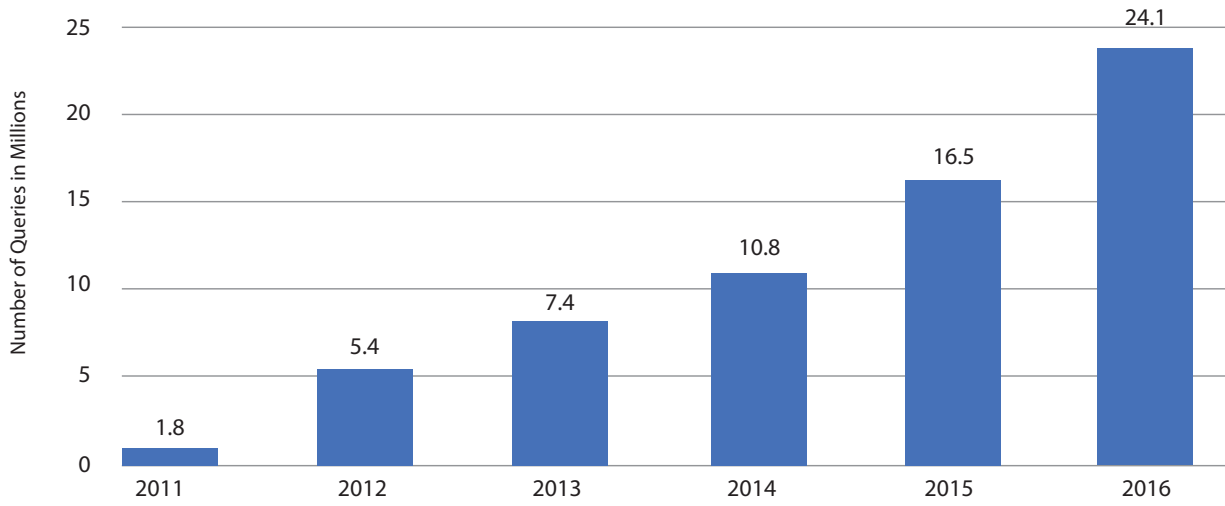
Source: State of Ohio Board of Pharmacy, Ohio Automated Rx Reporting System.

Figure 6. Opioid Solid Doses Dispensed to Ohio Patients, by Year, 2011-2016

Number of Solid Doses in Millions

Year	Value
2011	782
2012	793
2013	778
2014	751
2015	701
2016	631
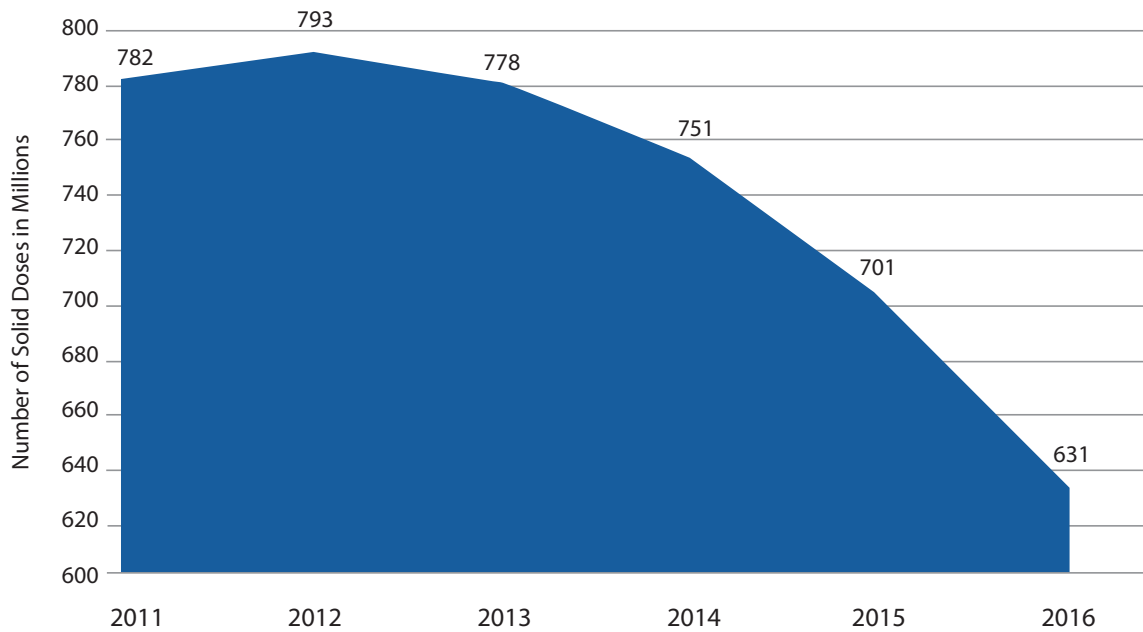
Source: State of Ohio Board of Pharmacy, Ohio Automated Rx Reporting System.

Unintentional Overdoses Involving Select Drugs and Age-Adjusted Death Rate

Figure 7. Number of Unintentional Drug Overdose Deaths Involving Selected Drugs, by Year, Ohio, 2000-2016
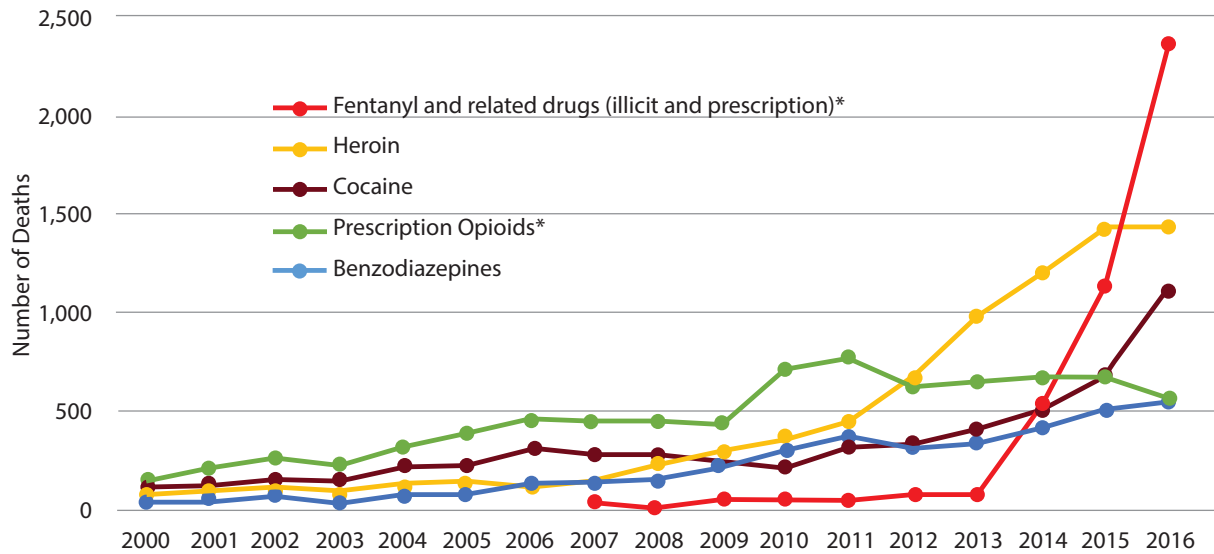
Legend:
- Fentanyl and related drugs (illicit and prescription)*
- Heroin
- Cocaine
- Prescription Opioids*
- Benzodiazepines

Source: Ohio Department of Health, Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Prevention Program.
Multiple drugs are usually involved in overdose deaths. Individual deaths may be reported in more than one category.
Includes Ohio residents who died due to unintentional drug poisoning (underlying cause of death ICD-10 codes X40-X44).
* Excludes deaths involving fentanyl and related drugs.

Figure 8. Number of Deaths and Annual Age-Adjusted Death Rate* per 100,000 Population from Unintentional Drug Overdose by Year, Ohio Residents, 2000-2016
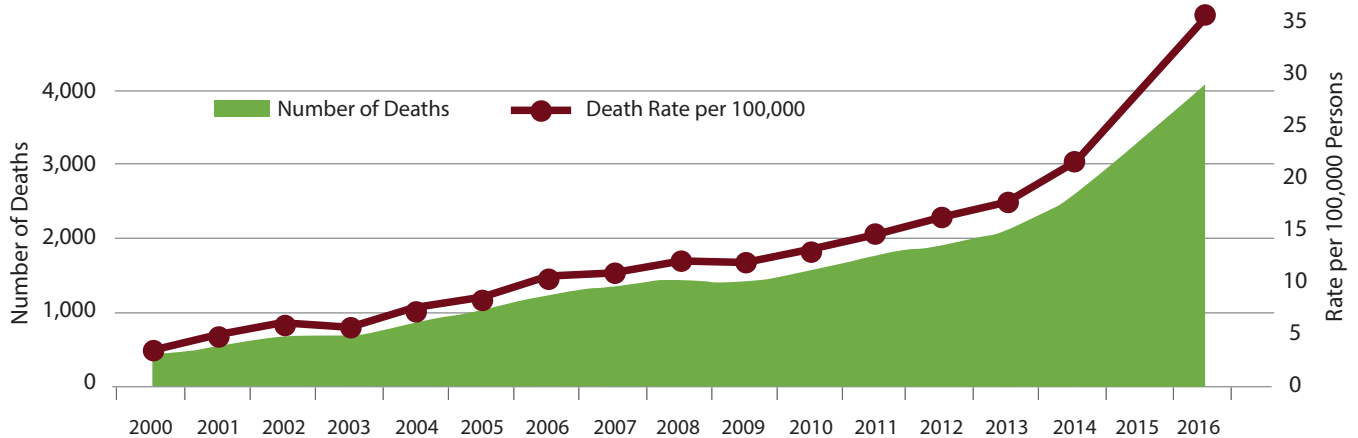
Legend:
- Number of Deaths
- Death Rate per 100,000

Source: Ohio Department of Health, Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Prevention Program.
*The death rate is presented as age-adjusted which allows a comparison of death rates between populations (e.g. counties and states). The rates are adjusted to the U.S. 2000 standard population to allow a comparison of the overall risk of dying between different populations.

Table 1. Number of Unintentional Drug Overdose Deaths Involving Specific Drug(s), As Mentioned on Death Certificate, by Year, 2004-2016 [1-3]

Drug Category	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	% of 2016 deaths
All opioids*	429	489	551	631	733	783	980	1,163	1,272	1,539	2,020	2,590	3,495	86.3%
Fentanyl & related drugs				75^	65^	72^	77^	73^	75	84	503	1,155	2,357	58.1%
Heroin	124	131	117	146	233	283	338	431	680	983	1,196	1,424	1,444	35.7%
Cocaine	221	223	317	287	252	220	213	309	326	405	517	685	1,109	27.4%
Prescription opioids**	319	388	462	435^	480^	482^	622^	724^	628	644	672	667	564	13.9%
Benzodiazepines	69	90	121	133	154	211	300	376	311	328	420	504	553	13.7%
Alcohol***	38	58	89	135	181	173	195	226	282	304	383	380	539	13.3%
Psychostimulants**** (e.g., Methamphetamines)	6	9	4	7	7	9	10	28	30	49	59	96	233	5.8%
Hallucinogens	8	8	10	13	14	9	26	31	31	43	49	61	100	2.5%
Methadone	116	144	161	176	168	169	155	156	123	112	103	108	94	2.3%
Barbiturates	3	5	3	7	3	5	13	11	6	10	6	19	14	0.3%
Other/unspecified drugs only*****	256	289	378	453	475	396	343	373	389	319	274	194	182	4.5%
Multiple Drug Involvement							888	980	1,016	1,014	1,321	1,747	2,451	60.5%
Total unintentional poisoning deaths	904	1,020	1,261	1,351	1,473	1,423	1,544	1,772	1,914	2,110	2,531	3,050	4,050	
Age-adjusted annual death rate per 100,000	7.9	8.9	11.0	11.8	12.9	12.7	13.7	15.4	17.0	18.7	22.7	27.7	36.8	

Source: Ohio Department of Health, Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Prevention Program.

Includes Ohio residents who died due to unintentional drug poisoning (underlying cause of death ICD-10 codes X40-X44).

1. Total includes out of state deaths of Ohio residents for all years.

2. Individual drugs do not add up to totals as more than one drug may be listed on the death certificate for one death.

3. Data completeness varies from year to year for residents who died out of state; approximately 2 percent of the fatal overdoses on average each year.

^ Data restated to incorporate coroner supplemental records not previously reflected in ODH Public Health Data Warehouse data for indicated years.

* Includes prescription opioids, fentanyl and heroin.

** Excludes deaths involving fentanyl and related drugs; fentanyl was not captured in the data prior to 2007.

*** Alcohol was present along with other drugs; alcohol is considered a non-drug poisoning in ICD 10 coded mortality data and is not included in total unintentional drug overdose deaths.

**** Includes methamphetamines and other psychostimulants with potential for abuse (ICD-10 code T43.6).

***** Includes only those instances where no other drug than T50.9 (other/unspecified) is included as contributing to death.

Figure 9. Average Age-Adjusted Unintentional Drug Overdose Death Rate Per 100,000 Population, by County, 2011-2016[1,2]

County	Rate
Williams	9.2
Fulton	17.4
Lucas	24.1
Ottawa	14.7
Lake	25.6
Ashtabula	26.6
Defiance	16.0
Henry	10.0
Wood	11.1
Sandusky	20.3
Erie	27.9
Lorain	26.2
Cuyahoga	23.4
Geauga	18.1
Trumbull	34.2
Paulding	—
Putnam	7.3
Hancock	14.0
Seneca	15.0
Huron	22.6
Medina	13.8
Summit	25.5
Portage	17.1
Mahoning	25.1
Van Wert	16.3
Allen	17.3
Wyandot	6.9
Crawford	17.8
Ashland	5.8
Wayne	15.0
Stark	16.0
Columbiana	25.3
Mercer	10.2
Auglaize	9.6
Hardin	19.8
Marion	31.7
Morrow	16.5
Richland	26.7
Holmes	—
Carroll	12.0
Jefferson	29.7
Shelby	20.0
Logan	16.2
Union	8.2
Delaware	7.2
Knox	15.8
Coshocton	10.1
Tuscarawas	11.3
Harrison	17.8
Darke	24.9
Miami	20.5
Champaign	20.0
Clark	36.6
Madison	16.7
Franklin	18.3
Licking	13.0
Muskingum	8.9
Guernsey	20.4
Belmont	19.8
Preble	28.9
Montgomery	42.5
Greene	21.3
Fairfield	11.9
Perry	14.5
Morgan	16.4
Noble	—
Monroe	—
Washington	18.4
Butler	40.5
Warren	18.0
Clinton	34.0
Fayette	31.0
Pickaway	17.9
Ross	33.4
Hocking	18.3
Vinton	19.7
Athens	18.4
Meigs	22.0
Hamilton	30.2
Clermont	39.5
Highland	20.0
Pike	28.3
Jackson	28.3
Gallia	25.0
Brown	41.0
Adams	37.2
Scioto	34.1
Lawrence	26.9

Death Rates per 100,000 Population

- ☐ Rates not calculated for death count <10
- 5.8 - 13.8
- 13.9 - 17.8
- 17.9 - 21.3
- 21.4 - 28.3
- 28.4 - 42.5

[1] Sources: Ohio Department of Health, Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Prevention Program; U.S. Census Bureau (Vintage 2016 population estimates).

[2] Includes Ohio residents who died due to unintentional drug poisoning (underlying cause of death ICD-10 codes X40-X44).

Rate suppressed if < 10 total deaths for 2011-2016.

NUMBER OF DRUG OVERDOSE DEATHS BY COUNTY — The number of drug overdose deaths by county are available in the Ohio Public Health Data Warehouse on the Ohio Department of Health's website (www.odh.ohio.gov). Once in the Warehouse:

- Select "Mortality"
- Select "Reports"
- Select "Unintentional Drug Overdose Data"
- Select "Unintentional Drug Overdose Resident Deaths per 100,000 Population by County" and "Run"
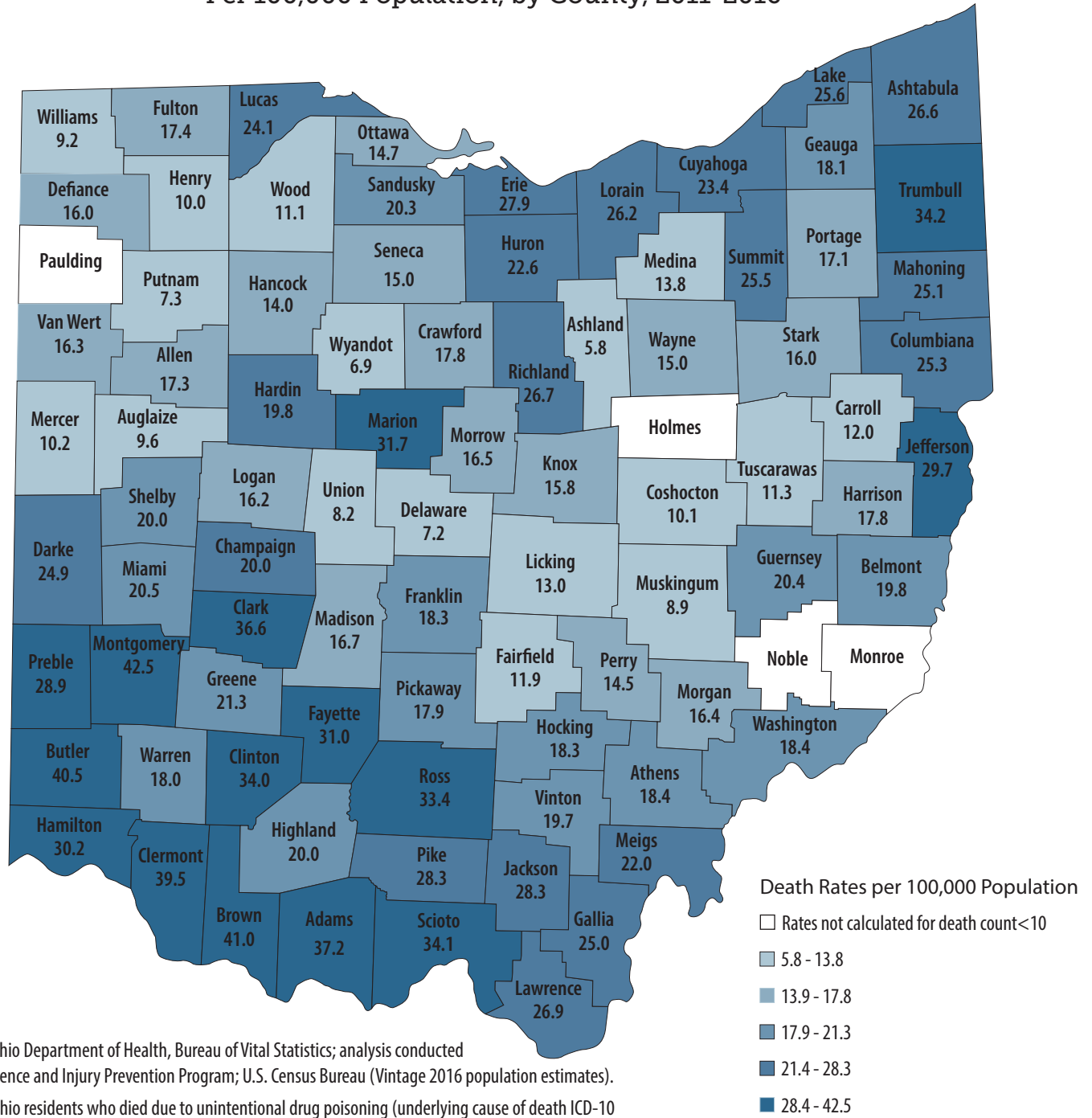
Table 2. Number of Unintentional Drug Overdose Deaths and Average Crude and Age-Adjusted Annual Death Rates Per 100,000 Population, by County, 2004-2016 [1,2,3]

County	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2011-2016 Total	Crude Rate	Age Adjusted Rate
MONTGOMERY	127	116	125	130	145	121	113	119	150	199	251	239	320	1,278	40.0	42.5
BROWN	8	5	5	10	12	13	17	11	14	17	17	23	18	100	37.7	41.0
BUTLER	21	31	47	45	55	68	59	80	92	120	151	195	211	849	37.9	40.5
CLERMONT	25	22	31	36	38	32	49	49	56	65	80	105	96	451	37.5	39.5
ADAMS	1	6	6	5	6	10	6	6	10	6	10	12	12	56	33.1	37.2
CLARK	25	15	18	20	19	19	19	34	36	28	38	71	73	280	34.2	36.6
TRUMBULL	38	29	30	58	41	43	43	57	34	37	54	89	111	382	31.0	34.2
SCIOTO	14	17	15	19	20	24	22	25	17	18	23	30	35	148	31.8	34.1
CLINTON	12	4	6	8	10	11	3	6	13	16	13	20	12	80	31.8	34.0
ROSS	7	14	11	19	20	24	17	18	12	15	29	38	40	152	32.8	33.4
MARION	5	7	3	8	9	9	8	13	19	18	27	22	24	123	31.2	31.7
FAYETTE	4	3	5	5	2	4	3	5	5	4	12	16	7	49	28.4	31.0
HAMILTON	72	86	98	96	113	101	110	150	159	212	248	335	318	1,422	29.4	30.2
JEFFERSON	9	12	12	9	15	23	13	25	14	17	21	16	14	107	26.3	29.7
PREBLE	1	4	3	7	11	9	7	5	11	6	8	15	21	66	26.4	28.9
JACKSON	4	4	14	7	8	5	7	8	9	12	8	9	7	53	26.9	28.3
PIKE	0	3	2	6	4	9	4	13	3	6	5	11	7	45	26.5	28.3
ERIE	2	3	4	5	6	6	18	12	12	16	17	23	37	117	25.7	27.9
LAWRENCE	7	5	7	8	13	11	9	17	10	9	8	23	27	94	25.4	26.9
RICHLAND	8	13	16	10	12	18	14	15	11	22	31	36	68	183	25.0	26.7
ASHTABULA	8	6	5	7	10	11	18	18	26	15	27	21	39	146	24.5	26.6
LORAIN	12	13	18	16	18	25	21	25	70	69	71	63	146	444	24.4	26.2
LAKE	13	18	29	26	15	20	39	42	48	43	53	50	94	330	24.0	25.6
SUMMIT	60	50	53	66	46	54	66	56	91	76	118	173	298	812	25.0	25.5
COLUMBIANA	4	1	7	7	8	9	8	18	17	27	19	30	39	150	23.7	25.3
MAHONING	16	29	25	25	42	38	48	47	48	41	48	60	83	327	23.3	25.1
GALLIA	3	4	6	2	4	5	3	6	3	7	6	9	11	42	23.0	25.0
DARKE	6	4	1	7	9	3	5	5	9	9	11	13	19	66	21.0	24.9
LUCAS	21	49	44	75	73	49	54	57	88	72	115	118	157	607	23.2	24.1
CUYAHOGA	114	115	168	134	144	144	159	212	230	255	255	275	547	1,774	23.5	23.4
OHIO TOTAL	904	1,020	1,261	1,351	1,473	1,423	1,544	1,772	1,914	2,110	2,531	3,050	4,050	15,427	22.2	23.1

Table 2. Number of Unintentional Drug Overdose Deaths and Average Crude and Age-Adjusted Annual Death Rates Per 100,000 Population, by County, 2004-2016 [1,2,3]

County	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2011-2016 Total	Crude Rate	Age Adjusted Rate
HURON	1	5	5	6	5	8	4	8	8	14	17	10	16	73	20.7	22.6
MEIGS	0	2	5	3	1	2	3	5	2	4	4	3	9	27	19.2	22.0
GREENE	16	19	21	16	31	21	27	23	23	21	40	43	44	194	19.7	21.3
MIAMI	8	11	8	10	20	15	14	12	16	12	19	17	39	115	18.5	20.5
GUERNSEY	2	2	0	3	2	4	12	3	3	7	9	9	13	44	18.5	20.4
SANDUSKY	5	1	7	8	9	2	4	11	4	5	13	12	22	67	18.6	20.3
CHAMPAIGN	2	0	4	1	4	1	7	6	6	4	11	6	10	43	18.2	20.0
HIGHLAND	2	6	4	4	4	5	6	7	3	8	12	9	6	45	17.4	20.0
SHELBY	4	2	3	7	12	8	5	8	5	9	7	8	15	52	17.7	20.0
BELMONT	7	6	5	3	8	8	5	5	10	8	14	18	20	75	18.0	19.8
HARDIN	4	2	10	6	6	3	6	6	1	10	1	8	7	33	17.4	19.8
VINTON	2	4	3	4	2	2	1	1	5	2	3	1	2	14	17.7	19.7
ATHENS	3	7	9	13	8	10	6	12	10	8	8	8	6	52	13.3	18.4
WASHINGTON	1	5	9	4	5	8	4	6	7	7	12	8	20	60	16.3	18.4
FRANKLIN	72	102	154	187	179	139	192	209	191	196	196	279	314	1,385	18.9	18.3
HOCKING	2	1	1	9	8	4	4	7	4	8	4	3	5	31	17.9	18.3
GEAUGA	3	3	5	2	5	2	7	11	8	11	11	15	24	80	14.2	18.1
WARREN	11	21	17	17	33	34	25	26	32	27	40	42	58	225	17.0	18.0
PICKAWAY	3	3	5	5	5	9	9	14	12	10	8	10	6	60	17.6	17.9
CRAWFORD	4	10	9	12	10	7	7	5	5	2	9	10	8	39	15.3	17.8
HARRISON	2	0	0	1	0	1	1	4	0	3	2	4	1	14	15.0	17.8
FULTON	1	1	1	2	1	2	6	5	9	3	5	6	10	38	14.9	17.4
ALLEN	5	4	6	6	9	5	5	9	14	15	12	18	31	99	15.7	17.3
PORTAGE	9	7	12	8	5	16	14	6	16	22	30	36	46	156	16.1	17.1
MADISON	0	1	2	5	4	5	10	3	7	7	7	7	15	46	17.6	16.7
MORROW	1	3	5	2	2	5	8	5	2	9	6	3	6	31	14.8	16.5
MORGAN	0	1	1	1	0	3	1	1	0	4	4	0	4	13	14.5	16.4
VAN WERT	0	1	4	1	4	1	3	6	1	4	4	1	8	24	14.0	16.3
LOGAN	5	3	6	6	5	5	6	0	5	9	4	8	14	40	14.7	16.2
DEFIANCE	1	2	1	5	1	2	3	5	3	5	7	7	6	33	14.3	16.0
STARK	15	16	25	25	30	21	39	40	35	42	59	59	97	332	14.8	16.0
KNOX	4	3	4	5	7	10	7	9	7	12	8	7	8	51	13.9	15.8
SENECA	1	3	3	2	1	7	0	8	6	7	11	9	5	46	13.7	15.0
WAYNE	3	6	7	0	11	7	6	13	7	4	13	24	36	97	14.0	15.0
OTTAWA	0	2	2	5	2	6	2	4	3	4	3	5	14	33	13.4	14.7
PERRY	2	2	2	4	3	2	4	4	7	0	4	7	6	28	13.0	14.5
HANCOCK	4	3	1	2	4	8	7	10	5	4	11	13	19	62	13.7	14.0

Table 2. Number of Unintentional Drug Overdose Deaths and Average Crude and Age-Adjusted Annual Death Rates Per 100,000 Population, by County, 2004-2016 [1,2,3]

County	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2011-2016 Total	Crude Rate	Age Adjusted Rate
MEDINA	3	8	7	8	9	13	7	13	17	14	17	27	41	129	12.3	13.8
LICKING	13	10	13	15	27	20	24	22	13	23	23	29	18	128	12.6	13.0
CARROLL	1	2	2	1	3	2	3	0	4	2	3	5	3	17	10.0	12.0
FAIRFIELD	12	8	7	13	7	17	15	12	19	17	15	16	23	102	11.4	11.9
TUSCARAWAS	0	3	8	1	3	4	7	13	8	11	6	8	14	60	10.8	11.3
WOOD	3	4	10	5	9	14	9	7	10	4	16	22	21	80	10.3	11.1
MERCER	1	1	2	3	1	2	2	4	1	5	5	3	5	23	9.4	10.2
COSHOCTON	2	5	2	2	4	1	2	4	3	4	2	3	4	20	9.1	10.1
HENRY	2	3	1	0	0	0	1	0	2	1	2	6	5	16	9.5	10.0
AUGLAIZE	0	2	1	2	3	3	3	3	5	3	2	9	4	26	9.4	9.6
WILLIAMS	0	1	1	1	2	2	3	1	1	5	2	1	9	19	8.5	9.2
MUSKINGUM	6	1	6	4	5	4	5	2	7	10	5	13	7	44	8.5	8.9
UNION	3	4	5	1	6	4	10	3	3	3	6	5	7	27	8.4	8.2
PUTNAM	0	0	1	1	2	2	1	0	1	2	3	4	4	14	6.8	7.3
DELAWARE	3	5	7	13	11	12	12	10	16	15	12	12	11	76	6.8	7.2
WYANDOT	0	0	1	1	1	1	2	2	1	1	0	2	4	10	7.4	6.9
ASHLAND	2	3	4	1	1	1	2	4	0	1	3	6	3	17	5.3	5.8
HOLMES	1	0	0	1	0	0	1	1	0	1	0	0	4	6	*	*
MONROE	0	0	1	0	0	2	0	0	1	0	4	1	1	7	*	*
NOBLE	0	0	1	2	2	1	1	0	0	1	0	5	1	7	*	*
PAULDING	0	2	1	0	3	2	2	0	2	0	3	0	0	5	*	*

[1] Table includes Ohio residents who died due to unintentional drug poisoning (underlying cause of death ICD-10 codes X40-X44).

[2] Sources: Ohio Department of Health, Bureau of Vital Statistics; analysis conducted by ODH Violence and Injury Prevention Program; U.S. Census Bureau (Vintage 2016 population estimates).

[3] County is based on county of residence; beginning in 2015 the residence county value was derived from the geocoded county value based on the decedent's residence street address when the geocode was considered of high quality.

*Rate suppressed when fewer than 10 total deaths for 2011-2016.

Additional data, resources and background information are available at:

http://www.odh.ohio.gov/health/vipp/drug/dpoison.aspx