

**Kentucky Injury Prevention and Research Center**

**Drug Overdose Deaths  
among Kentucky  
Residents, 2000-2016**

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**Released by**

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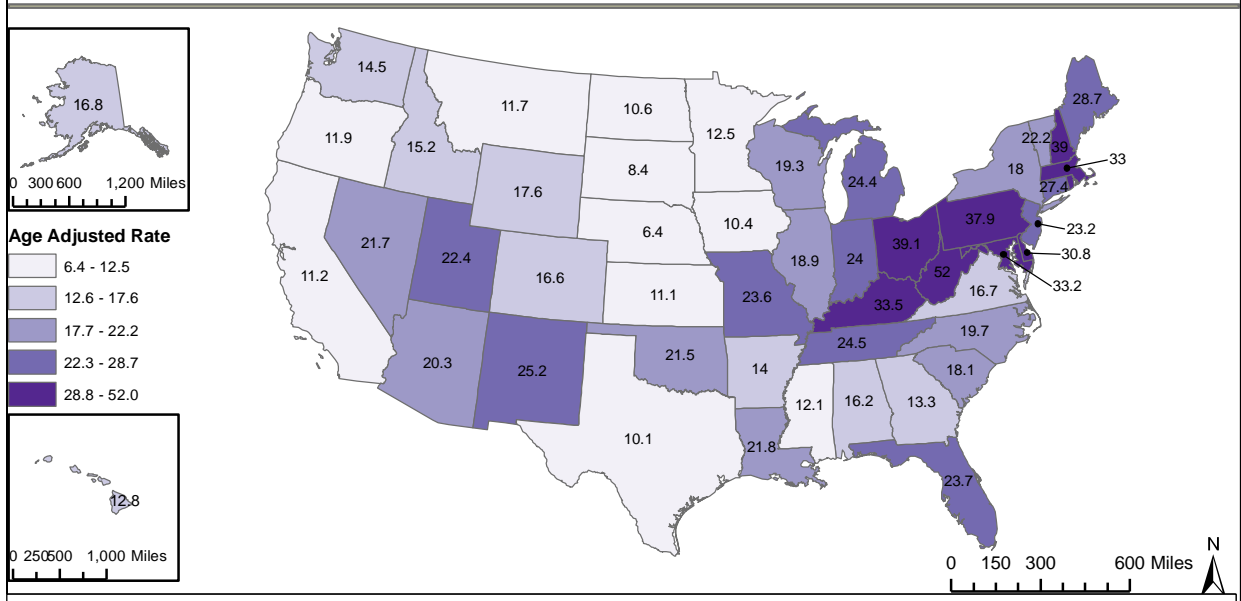
**Kentucky Public Health**  
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## Executive Summary

1. The age adjusted drug overdose death rate among Kentucky residents was 33.5 deaths per 100,000 residents in 2016 (Figure 2), ranking 5<sup>th</sup> behind West Virginia, Ohio, New Hampshire, and Pennsylvania.
2. There were 1,419 deaths among Kentucky residents in 2016 (Figure 3). This is an increase of 11.5% from the 1,273 deaths in 2015, and marks the third straight year of increase in drug overdose deaths among Kentucky residents.
3. The age adjusted drug overdose death rate among Kentucky residents of 33.5 deaths per 100,000 residents in 2016 was 69% higher than the national age adjusted drug overdose death rate of 19.8 (Figure 4).
4. The 25-34, 35-44, and 45-54 age groups were also the age groups in Kentucky that deviated the most from the national rates from 2014-2016 (Figure 5). The rate of drug overdose deaths among the 25-34 age group was 48.7 per 100,000 Kentucky residents versus 34.6/100,000 nationally. The rate of drug overdose deaths among the 35-44 age group was 62.6/100,000 versus 35.0/100,000 nationally. The rate of drug overdose deaths among the 45-54 age group was 53.9/100,000 versus 34.5/100,000 nationally.
5. The age group with the highest drug overdose death rate among Kentucky residents in 2016 was the 35-44 age group with a rate of 77.6 deaths per 100,000 residents, followed by the 45-54 age group (57.3/100,000), and the 25-44 age group (53.5/100,000) (Figure 6).
6. The age adjusted drug overdose death rate among male Kentucky residents was 41.9 per 100,000 residents in 2016, higher than the female rate of 25.1/100,000 (Figure 7); both rates were greater than their national counterparts of 26.2/100,000 male residents and 13.4/100,000 female residents.
7. The age adjusted heroin overdose death rate of deaths among Kentucky residents was 7.6 per 100,000 residents in 2016, higher than the national rate of 4.9/100,000 (Figure 10). This rate increased from 0.9/100,000 in 2010 to 7.6/ 100,000 residents in 2016 among Kentucky residents, while the national rate increased from 1.0/100,000 to 4.9/100,000 over the same time period.
8. The age adjusted synthetic opioid (other than methadone) death rate was 11.5 per 100,000 Kentucky residents in 2016, higher than the national rate of 6.2/100,000 (Figure 12). The rate of 11.5 per 100,000 Kentucky residents in 2016 marked a third straight year of increase from the rate of 1.7/100,000 observed in 2013.
9. The age adjusted cocaine overdose death rate among Kentucky residents was 3.5 per 100,000 residents in 2016, similar to the national rate of 3.2/100,000 in 2016 (Figure 13). This is more than double the rate of 1.7/100,000 observed in 2014.
10. The age adjusted drug overdose death rate of deaths among Kentucky Appalachian residents was 29.8 per 100,000 residents in 2016, and 34.7 per 100,000 resident in 2016 among Non-Appalachian Kentucky residents (Figure 14).

**Figure 1: Age Adjusted Drug Overdose Mortality Rates by State, 2016**



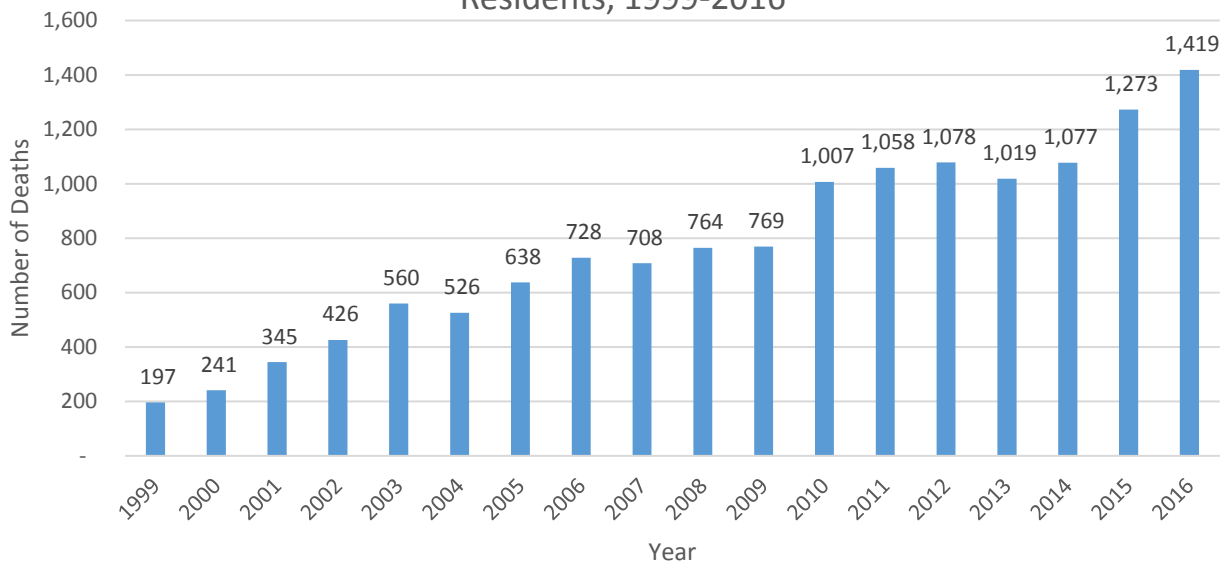
Produced by the Kentucky Injury Prevention and Research Center (KIPRC), as bona fide agent for the Kentucky Department for Public Health, January 2017. Data sources: Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death 1999-2016 on CDC WONDER Online Database, released December, 2017. Data are from the Multiple Cause of Death Files, 1999-2016, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at <http://wonder.cdc.gov/mcd-icd10.html> on Jan 8, 2018. Data are provisional and subject to change.

**Figure 2: States with the Highest Age Adjusted Drug Overdose Death Rates, 2016**

State	Total Drug Overdose Deaths	Population	Crude Rate per 100,000	Age Adjusted Rate per 100,000
<b>1. West Virginia</b>	884	1,831,102	48.3	52.0
<b>2. Ohio</b>	4,329	11,614,373	37.3	39.1
<b>3. New Hampshire</b>	481	1,334,795	36.0	39.0
<b>4. Pennsylvania</b>	4,627	12,784,227	36.2	37.9
<b>5. Kentucky</b>	1,419	4,436,974	32.0	33.5
<b>6. Maryland</b>	2,044	6,016,447	34.0	33.2
<b>7. Massachusetts</b>	2,227	6,811,779	32.7	33.0
<b>8. Rhode Island</b>	326	1,056,426	30.9	30.8
<b>9. Delaware</b>	282	952,065	29.6	30.8
<b>10. Maine</b>	353	1,331,479	26.5	28.7
<b>11. Connecticut</b>	971	3,576,452	27.1	27.4
<b>12. New Mexico</b>	500	2,081,015	24.0	25.2
<b>13. Tennessee</b>	1,630	6,651,194	24.5	24.5
<b>14. Michigan</b>	2,347	9,928,300	23.6	24.4
<b>15. Indiana</b>	1,526	6,633,053	23.0	24.0

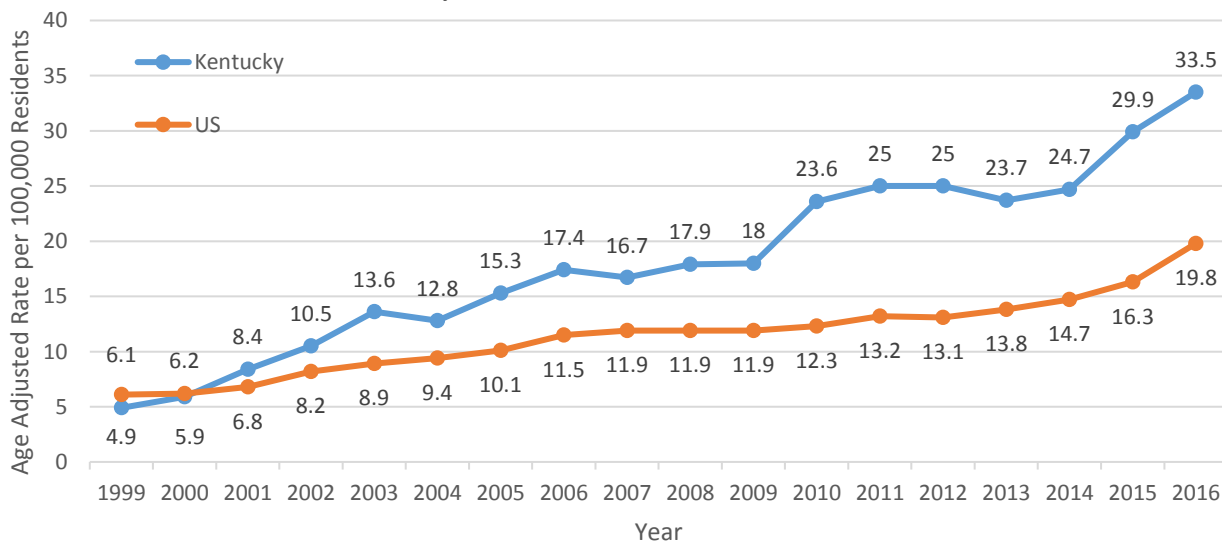
Produced by the Kentucky Injury Prevention and Research Center (KIPRC), as bona fide agent for the Kentucky Department for Public Health, January 2017. Data sources: Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death 1999-2016 on CDC WONDER Online Database, released December, 2017. Data are from the Multiple Cause of Death Files, 1999-2016, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at <http://wonder.cdc.gov/mcd-icd10.html> on Jan 8, 2018. Data are provisional and subject to change.

**Figure 3: Number of Drug Overdose Deaths among Kentucky Residents, 1999-2016**



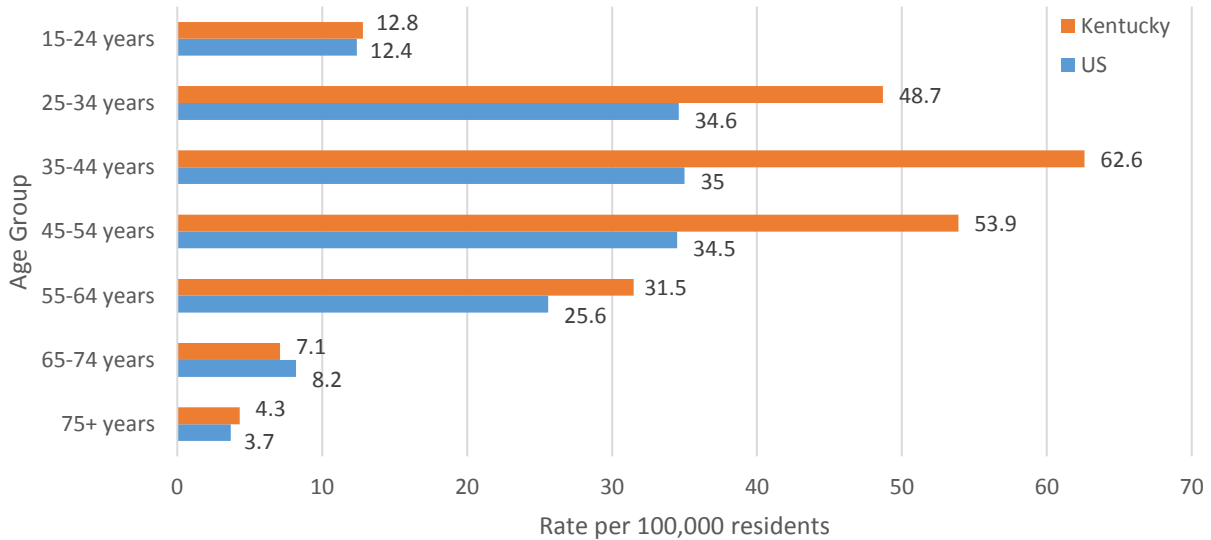
Produced by the Kentucky Injury Prevention and Research Center (KIPRC), as bona fide agent for the Kentucky Department for Public Health, January 2017. Data sources: Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death 1999-2016 on CDC WONDER Online Database, released December, 2017. Data are from the Multiple Cause of Death Files, 1999-2016, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at <http://wonder.cdc.gov/mcd-icd10.html> Jan 8, 2018. Data are provisional and subject to change.

**Figure 4: Age Adjusted Drug Overdose Mortality Rates for Kentucky vs. US Residents, 1999-2016**



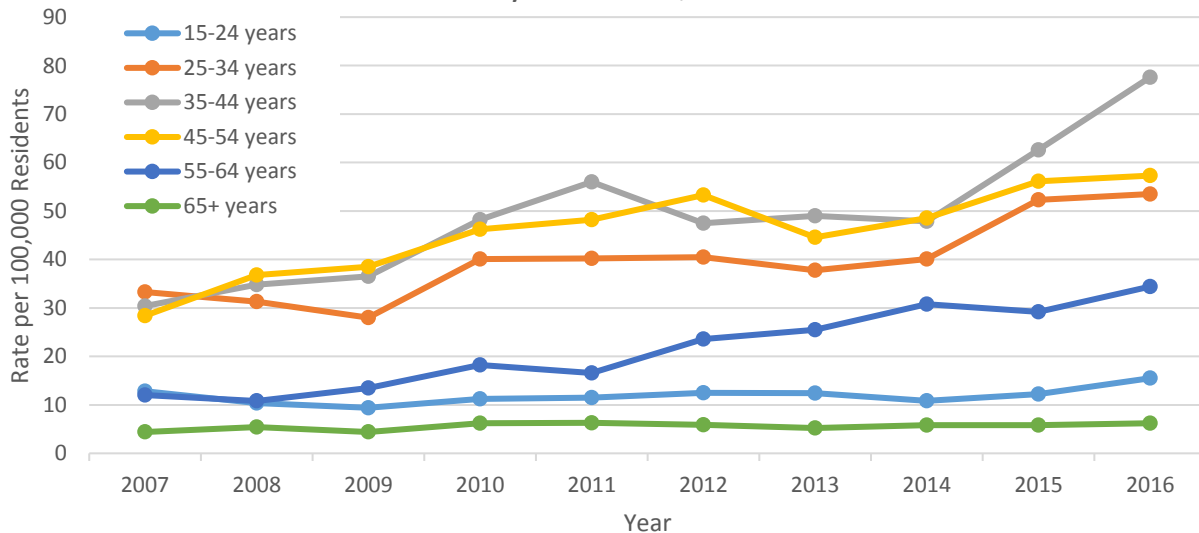
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**Figure 5: Drug Overdose Death Rates for Kentucky vs. US Residents by Age Group, 2014-2016**



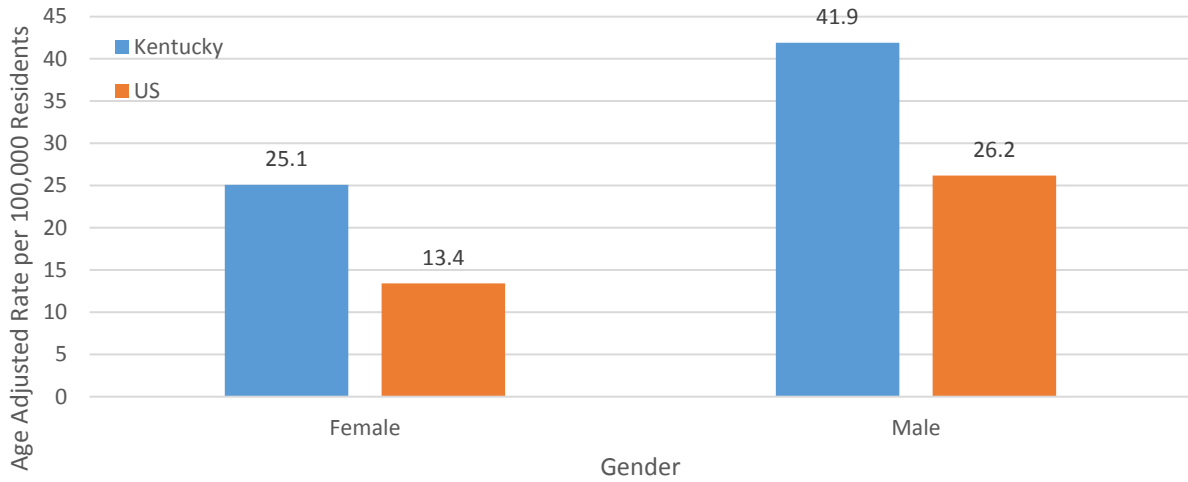
Produced by the Kentucky Injury Prevention and Research Center (KIPRC), as bona fide agent for the Kentucky Department for Public Health, January 2017. Data sources: Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death 1999-2016 on CDC WONDER Online Database, released December, 2017. Data are from the Multiple Cause of Death Files, 1999-2016, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at <http://wonder.cdc.gov/mcd-icd10.html> Jan 8, 2018. Data are provisional and subject to change.

**Figure 6: Drug Overdose Death Rates by Age Group among Kentucky Residents, 2007-2016**



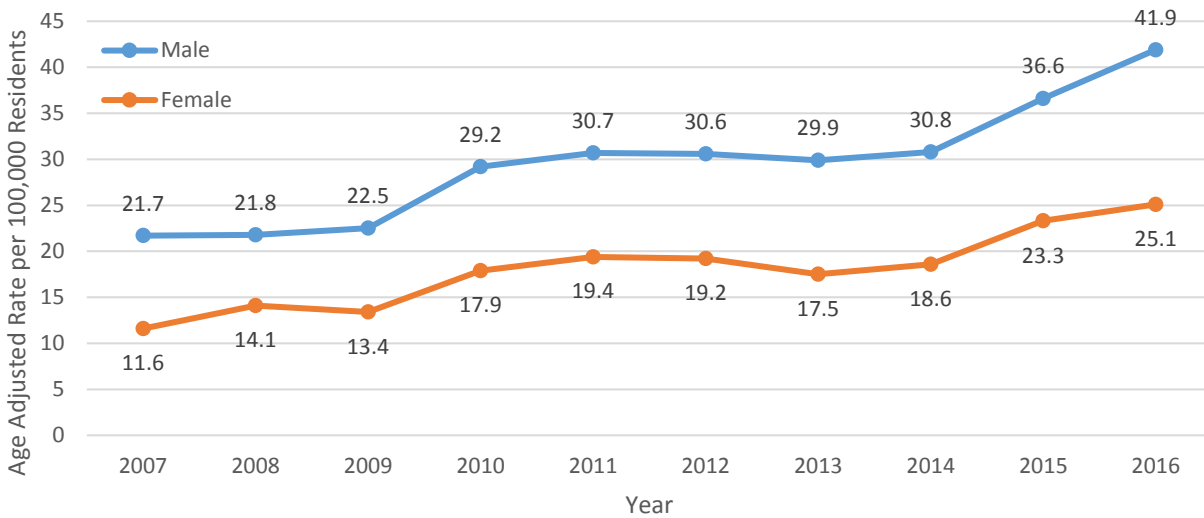
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**Figure 7: Drug Overdose Age Adjusted Death Rates by Gender for Kentucky vs. US Residents, 2016**



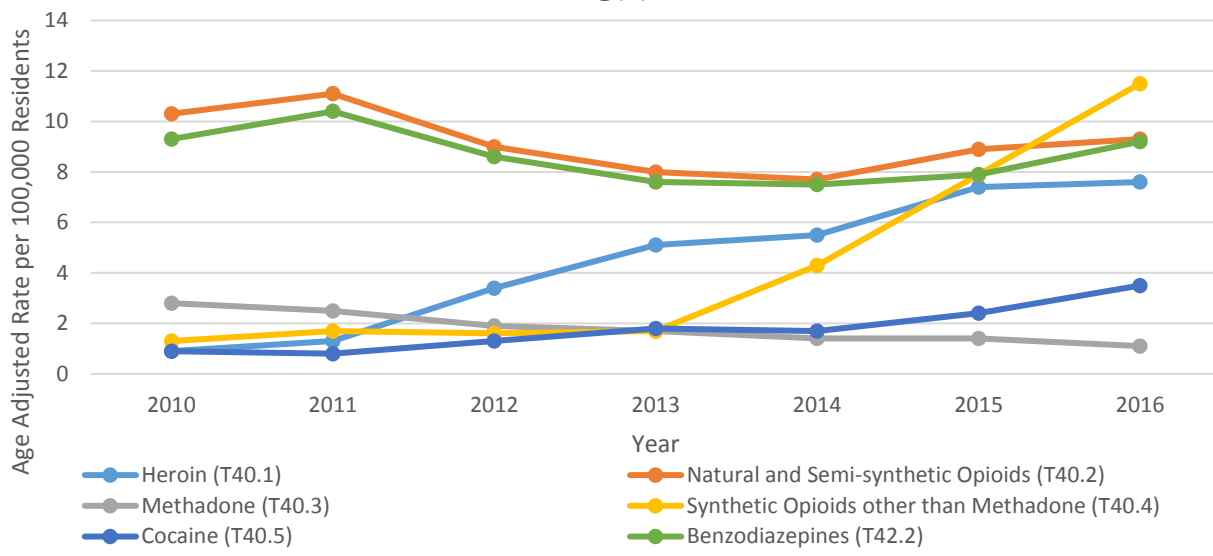
Produced by the Kentucky Injury Prevention and Research Center (KIPRC), as bona fide agent for the Kentucky Department for Public Health, January 2017. Data sources: Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death 1999-2016 on CDC WONDER Online Database, released December, 2017. Data are from the Multiple Cause of Death Files, 1999-2016, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at <http://wonder.cdc.gov/mcd-icd10.html> Jan 8, 2018. Data are provisional and subject to change.

**Figure 8: Drug Overdose Age Adjusted Death Rates by Gender among Kentucky Residents, 2007-2016**



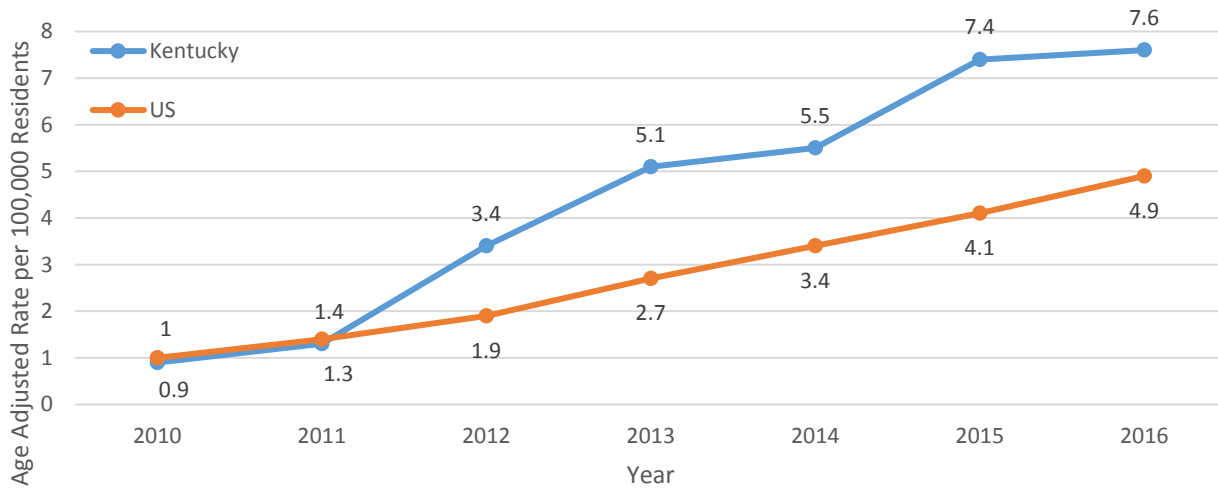
Produced by the Kentucky Injury Prevention and Research Center (KIPRC), as bona fide agent for the Kentucky Department for Public Health, January 2017. Data sources: Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death 1999-2016 on CDC WONDER Online Database, released December, 2017. Data are from the Multiple Cause of Death Files, 1999-2016, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at <http://wonder.cdc.gov/mcd-icd10.html> Jan 8, 2018. Data are provisional and subject to change.

**Figure 9: Kentucky Resident Drug Overdose Death Rates by Involved Drug(s), 2010-2016**



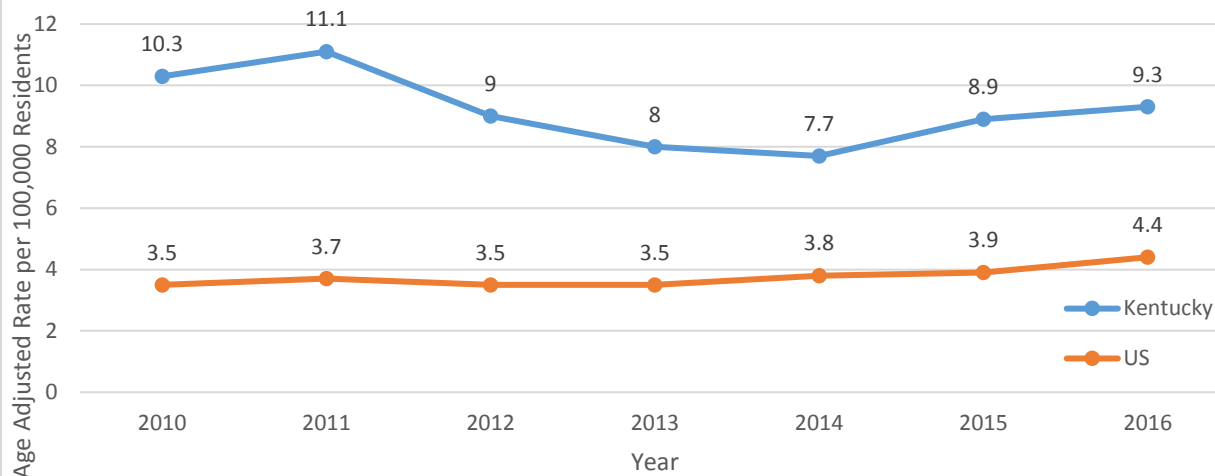
Deaths were counted under each relevant category. Produced by the Kentucky Injury Prevention and Research Center (KIPRC), as bona fide agent for the Kentucky Department for Public Health, January 2017. Data sources: Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death 1999-2016 on CDC WONDER Online Database, released December, 2017. Data are from the Multiple Cause of Death Files, 1999-2016, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at <http://wonder.cdc.gov/mcd-icd10.html> Jan 8, 2018. Data are provisional and subject to change.

**Figure 10: Age Adjusted Heroin Overdose Fatality Rates (T40.1) for Kentucky vs. US Residents, 2007-2016**



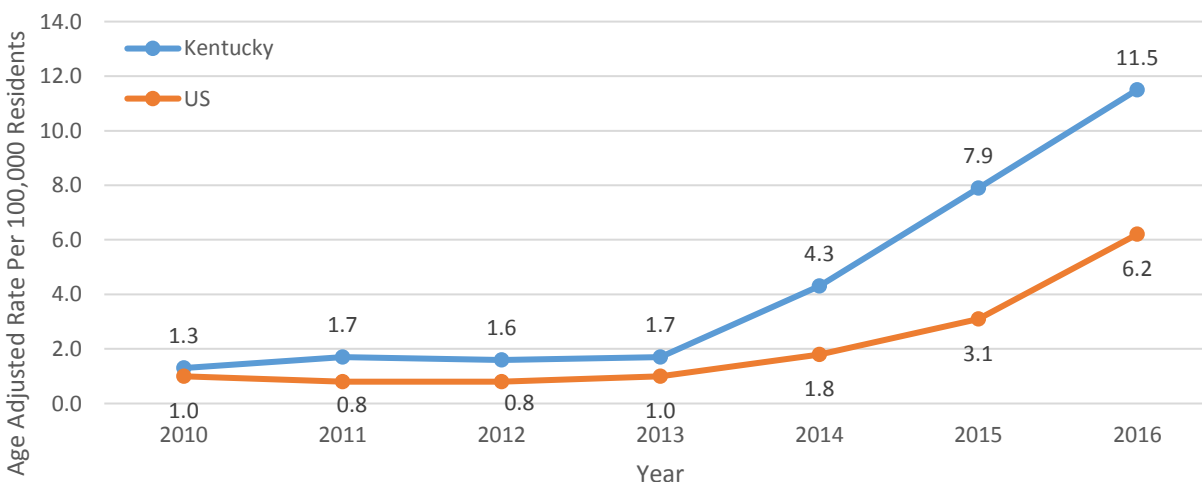
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**Figure 11: Age Adjusted Rates for Deaths Involving Natural and Semi-synthetic Opioids (T40.2) for Kentucky vs. US Residents, 2007-2016**



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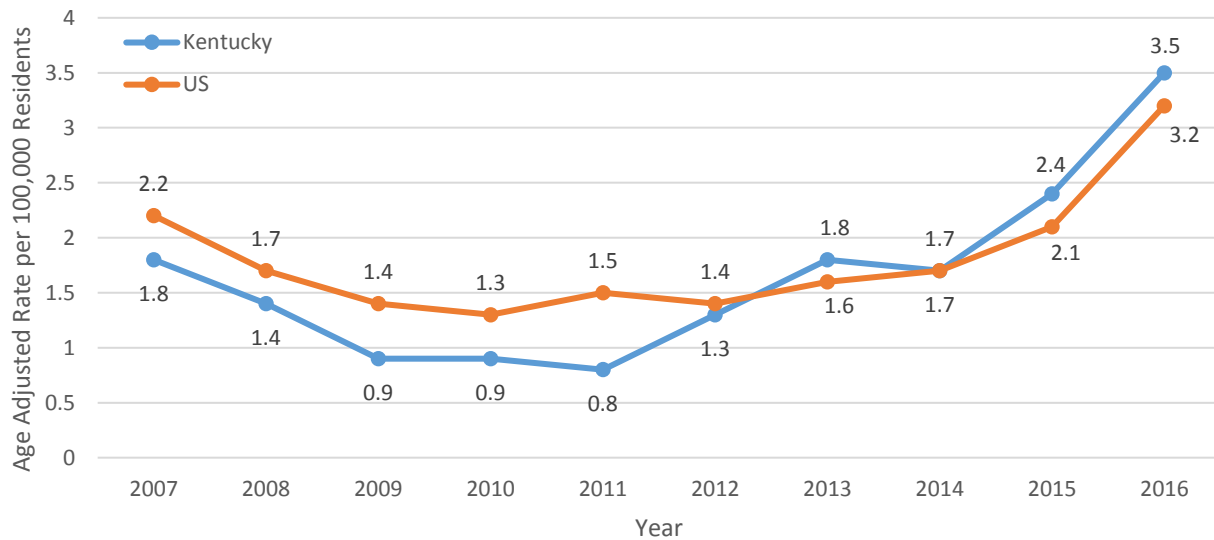
**Figure 12: Age Adjusted Rates for Deaths Involving Synthetic Opioids Other than Methadone (T40.4) for Kentucky vs. US Residents, 2007-2016**



Produced by the Kentucky Injury Prevention and Research Center (KIPRC), as bona fide agent for the Kentucky Department for Public Health, January 2017. Data sources: Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death 1999-2016 on CDC WONDER Online Database, released December, 2017. Data are from the Multiple Cause of Death Files, 1999-2016, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at <http://wonder.cdc.gov/mcd-icd10.html> Jan 8, 2018. Data are provisional and subject to change.

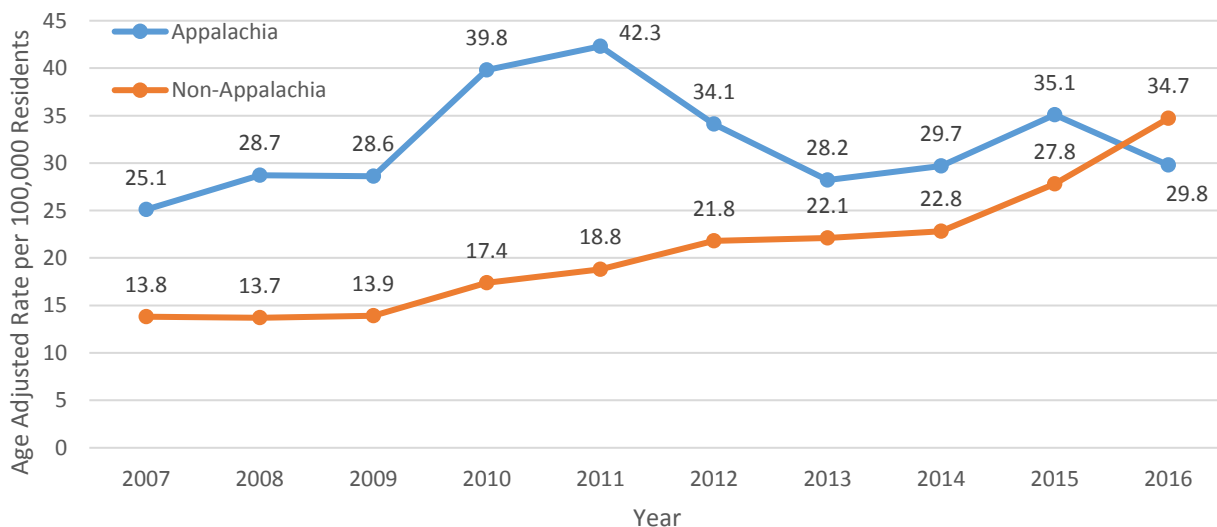


**Figure 13: Age Adjusted Cocaine Fatality Rates (T40.5) for Kentucky vs. US Residents, 2007-2016**



Produced by the Kentucky Injury Prevention and Research Center (KIPRC), as bona fide agent for the Kentucky Department for Public Health, January 2017. Data sources: Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death 1999-2016 on CDC WONDER Online Database, released December, 2017. Data are from the Multiple Cause of Death Files, 1999-2016, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at <http://wonder.cdc.gov/mcd-icd10.html> Jan 8, 2018. Data are provisional and subject to change.

**Figure 14: Age Adjusted Drug Overdose Fatality Rates for Kentucky Appalachian vs. Non-Appalachian Residents, 2007-2016**



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## Appendix

This report presents drug overdose mortality data for Kentucky residents. The data source for the report is the U.S. Multiple Cause of Death files, 1999-2016, accessible through the CDC WONDER online query system <http://wonder.cdc.gov/mcd-icd10.html>. The Multiple Cause of Death database contains mortality and population counts for all U.S. counties. Data are based on death certificates for U.S. residents.

Typically, when a drug overdose death occurs, the coroner completes a death certificate and lists the causes of death and information on how the death occurred. This information/text is then transferred in an electronic record that is sent to the National Center for Health Statistics (NCHS) at the Centers for Disease Control and Prevention (CDC) to be coded according to the guidelines of the Tenth Revision of the International Classification of Diseases (ICD-10) [[www.who.int/classifications/icd10/](http://www.who.int/classifications/icd10/)] to allow standardized classification of the causes of death. Each death certificate is assigned a single underlying cause of death and up to twenty additional multiple causes of death. The underlying cause of death is defined as the reason that initiated the chain of events leading directly to death.

For example, the death described below is coded with an underlying cause of death being unintentional drug overdose (X42 Accidental poisoning and exposure to narcotics and psychodysleptics). The following additional multiple causes of death were assigned based on the information listed on the death certificate: T40.3 Methadone, G93.1 Anoxic brain damage, T50.9 Other and unspecified drugs.

CAUSE OF DEATH (See instructions and examples)		Approximate Interval: Onset to death
32. PART I. Enter the <u>chain of events</u> -- diseases, injuries, or complications -- that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the attack. DO NOT ABBREVIATE. Enter only one cause on a line. Add additional lines if necessary.		
<b>IMMEDIATE CAUSE</b> (Final disease or condition resulting in death)	a. ANOXIA BRAIN INJURY	G93.1 Anoxic brain damage, NEC
	Due to (or as a consequence of):	T40.3 Methadone
	b. SECONDARY TO INGESTION OF METHADONE	
	Due to (or as a consequence of):	
32. PART II. Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in Part I.		
X42 Accidental poisoning and exposure to narcotics and psychodysleptics, NEC		
33. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input type="checkbox"/> No <input type="checkbox"/> Unknown		33. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input type="checkbox"/> No
36. IF FEMALE: <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant but pregnant within 42 days of death <input type="checkbox"/> Not pregnant but pregnant 43 days to 1 year before death <input type="checkbox"/> Unknown if pregnant within the past year		29. MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Pending Investigation <input checked="" type="checkbox"/> Accident <input type="checkbox"/> Could not be Determined <input type="checkbox"/> Suicide <input type="checkbox"/> Homicide
38. DATE OF INJURY (Mo/Day/Yr)(Spell Month)	39. TIME OF INJURY	40. PLACE OF INJURY (e.g., Decedent's home, construction site, restaurant, wooded area) HOME
42. LOCATION OF INJURY: State: _____ City or Town: _____ Zip Code: _____		41. INJURY AT WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No
43. DESCRIBE HOW INJURY OCCURRED DRUG INGESTION		TRANSPORTATION INJURY, SPECIFY <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify)
T50.9 Other and unspecified drug		

When the information on the death certificate is not specific enough and there is no mention of a particular drug contributing to the death, the death cannot be associated with a drug/drug class. For example, about one third of the death certificates for drug overdose cases in Kentucky list only “drug overdose”, “drug toxicity”, “acute drug intoxication”, or “polypharmacy intoxication”, with no mention of particular drugs involved. Therefore, the involvement of pharmaceutical opioids or heroin in Kentucky resident overdose deaths could be underestimated as about one third of the overdose deaths are not associated with specific drugs. When an overdose death involves multiple drugs from different classes (for example heroin and methadone), each drug will receive appropriate ICD-10-coded cause of death (T40.1 for heroin, T40.3 for methadone) and the death will be counted under both categories of drugs (heroin-associated deaths and pharmaceutical opioid-associated deaths). If an overdose death involves multiple drugs from the same drug class, only one multiple cause of death ICD-10 code will be assigned. For example, if oxycodone and hydrocodone are both listed on a death certificate, their involvement will be coded with one ICD-10 code (T40.2) that represents the involvement of natural or semi-synthetic opioids.

**Definition:** Drug overdose deaths were identified as deaths with an underlying cause of death in the following ICD-10 code range: X40-X44(accidental/unintentional drug poisoning), X60-X64(suicide by drug poisoning), X85(homicide by drug poisoning), and Y10-Y14 (drug poisoning with undetermined intent).

X40 (Accidental poisoning by and exposure to nonopioid analgesics, antipyretics and antirheumatics)  
 X41 (Accidental poisoning by and exposure to antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified)  
 X42 (Accidental poisoning by and exposure to narcotics and psychodysleptics [hallucinogens], not elsewhere classified)  
 X43 (Accidental poisoning by and exposure to other drugs acting on the autonomic nervous system)  
 X44 (Accidental poisoning by and exposure to other and unspecified drugs, medicaments and biological substances)  
 X60 (Intentional self-poisoning by and exposure to nonopioid analgesics, antipyretics and antirheumatics)  
 X61 (Intentional self-poisoning by and exposure to antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified)  
 X62 (Intentional self-poisoning by and exposure to narcotics and psychodysleptics [hallucinogens], not elsewhere classified)  
 X63 (Intentional self-poisoning by and exposure to other drugs acting on the autonomic nervous system)  
 X64 (Intentional self-poisoning by and exposure to other and unspecified drugs, medicaments and biological substances)  
 X85 (Assault by drugs, medicaments and biological substances)  
 Y10 (Poisoning by and exposure to nonopioid analgesics, antipyretics and antirheumatics, undetermined intent)  
 Y11 (Poisoning by and exposure to antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified, undetermined intent)  
 Y12 (Poisoning by and exposure to narcotics and psychodysleptics [hallucinogens], not elsewhere classified, undetermined intent)  
 Y13 (Poisoning by and exposure to other drugs acting on the autonomic nervous system, undetermined intent)  
 Y14 (Poisoning by and exposure to other and unspecified drugs, medicaments and biological substances, undetermined intent)

The types of drugs contributing to drug overdose deaths can be identified using ICD-10 codes T36-T50.9 listed in any of the multiple causes of death fields. In this report we included statistics on drug overdose deaths involving heroin (T40.1), pharmaceutical opioids (T40.2, T40.3, or T40.4), cocaine (T40.5), or benzodiazepines (T42.4).

Age-adjusted morbidity and mortality rates were based on 2000 U.S. standard population data.

Previous reports (<http://www.mc.uky.edu/kiprc/projects/kdodhedv/index.html>) on Kentucky resident drug overdose deaths were based on data from the state Office of Vital Statistics and therefore the numbers do not necessarily match with the numbers presented in this report.