

Drug Overdose Deaths, Hospitalizations, and Emergency Department Visits in Kentucky, 2000 - 2012



Kentucky Injury Prevention and Research Center

**Drug Overdose Deaths, Hospitalizations,
and Emergency Department Visits
in Kentucky, 2000-2012**

January, 2014

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Executive Summary

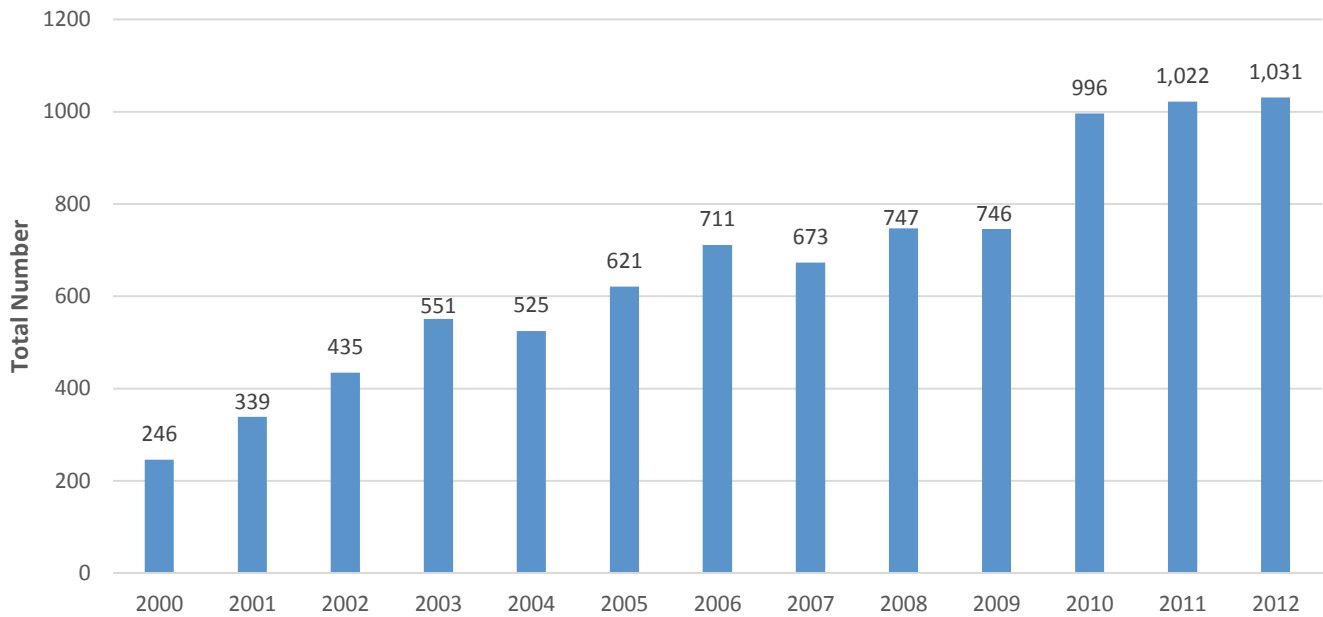
1. The total number of Kentucky resident drug overdose deaths leveled off from 2011 to 2012 (1,022 deaths in 2011 and 1,031 deaths in 2012).
2. The Kentucky resident age-adjusted drug overdose mortality rate decreased from 24.2 in 2011 to 23.9 in 2012 (1.2% decrease).
3. Pharmaceutical opioids remained the primary cause of Kentucky resident drug overdose deaths in 2012; pharmaceutical opioids accounted for 471 drug overdose deaths.
4. Heroin contributed to 129 Kentucky resident drug overdose deaths in 2012, a 207% increase from the 42 heroin-involved deaths recorded in 2011.
5. Benzodiazepines contributed to 362 Kentucky resident overdose deaths in 2012, decreasing 16% from 2011.
6. Kentucky age-adjusted drug overdose hospitalization rates decreased 2.4% from 2011 to 2012, from 146.6 hospitalizations/100,000 population in 2011 to 143.1 in 2012.
7. Intent to self-harm was the primary reason for 2012 Kentucky resident inpatient hospitalizations, similar to years 2000-2011.
8. Benzodiazepines were the primary drugs involved in Kentucky resident inpatient hospitalizations in 2012 decreasing 11% to 1,686 hospitalizations in 2012.
9. Pharmaceutical opioids were the second leading drug type involved in drug overdose related hospitalizations in 2012, decreasing 8% from 1,610 hospitalizations in 2011 to 1,483 in 2012.
10. Total charges for drug overdose hospitalizations rose 7% from \$121.1 million in 2011 to \$129.3 million in 2012.
11. The primary expected payer source for Kentucky resident drug overdose inpatient hospitalizations was Medicare followed by Medicaid for 2011 and 2012; Medicare was billed \$41.3 million and Medicaid was billed \$34.1 million in 2012.
12. Casey, Carroll, Nicholas, Powell, and Johnson counties had the highest Kentucky resident drug overdose emergency department (ED) visit rates, 2008-2012.

Executive Summary (cont'd)

13. Kentucky resident drug overdose ED visit numbers and rates leveled off in 2012 from 6,496 visits and an age-adjusted rate of 153.1 visits/100,000 population in 2011 to 6,492 visits and an age-adjusted rate of 153.0 in 2012.
14. Kentucky resident drug overdose ED visit charges increased 5% from \$14.6 million in 2011 to \$15.3 million in 2012.
15. Self-pays were the primary payer billed for drug overdose ED admissions in 2012 at \$5 million; Medicaid was billed \$4.2 million and commercial insurance was billed \$3.6 million.
16. Benzodiazepines were the primary drugs involved in Kentucky drug overdose ED visits in 2012 with 856 visits; pharmaceutical opioid involvement decreased 6% to 721 visits in 2012.
17. Heroin involvement in drug overdose related ED visits increased 197% from 266 ED visits in 2011 to 789 visits in 2012.
18. Medicaid recipient total drug overdose ED charges totaled \$740,000 in 2012, a 27% increase from a total of \$584,000 charged in 2011.
19. Medicaid recipient total drug overdose inpatient hospitalization charges totaled \$11 million in 2012, approximately the same as in 2011.
20. Kentucky resident opioid-related disease condition hospitalization charges totaled \$167 million in 2012; Medicaid was billed for \$55 million.
21. There were 824 Kentucky resident neonatal abstinence syndrome hospitalizations. Associated charges amounted to \$40 million; Medicaid was charged \$35 million.
22. Of the 9,713 pharmaceutical opioid or heroin related hospitalizations in 2012, viral hepatitis was co-diagnosed for 1,653 (17%) of them with associated charges of \$37 million.
23. There were 1,192 hospitalizations involving opioid drug dependence and viral hepatitis in 2012, a 22% increase over the 976 hospitalizations in 2011.

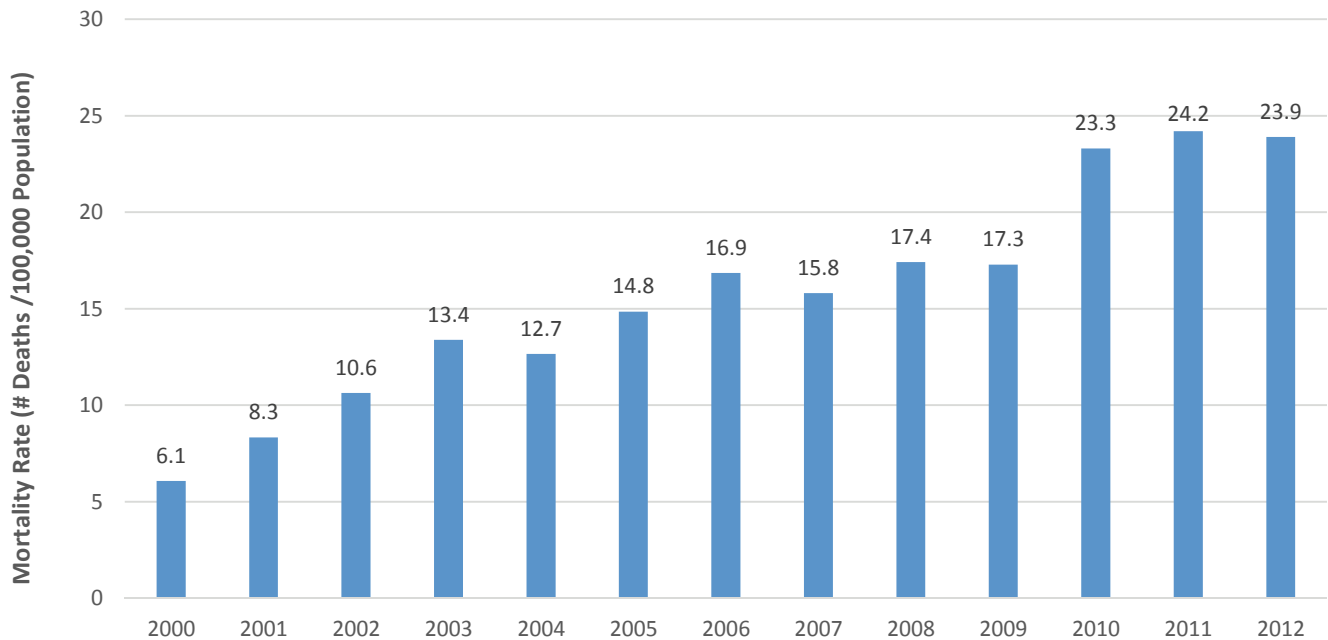
**Drug Overdose
Deaths
2000-2012**

Kentucky Resident Drug Overdose Deaths, 2000-2012



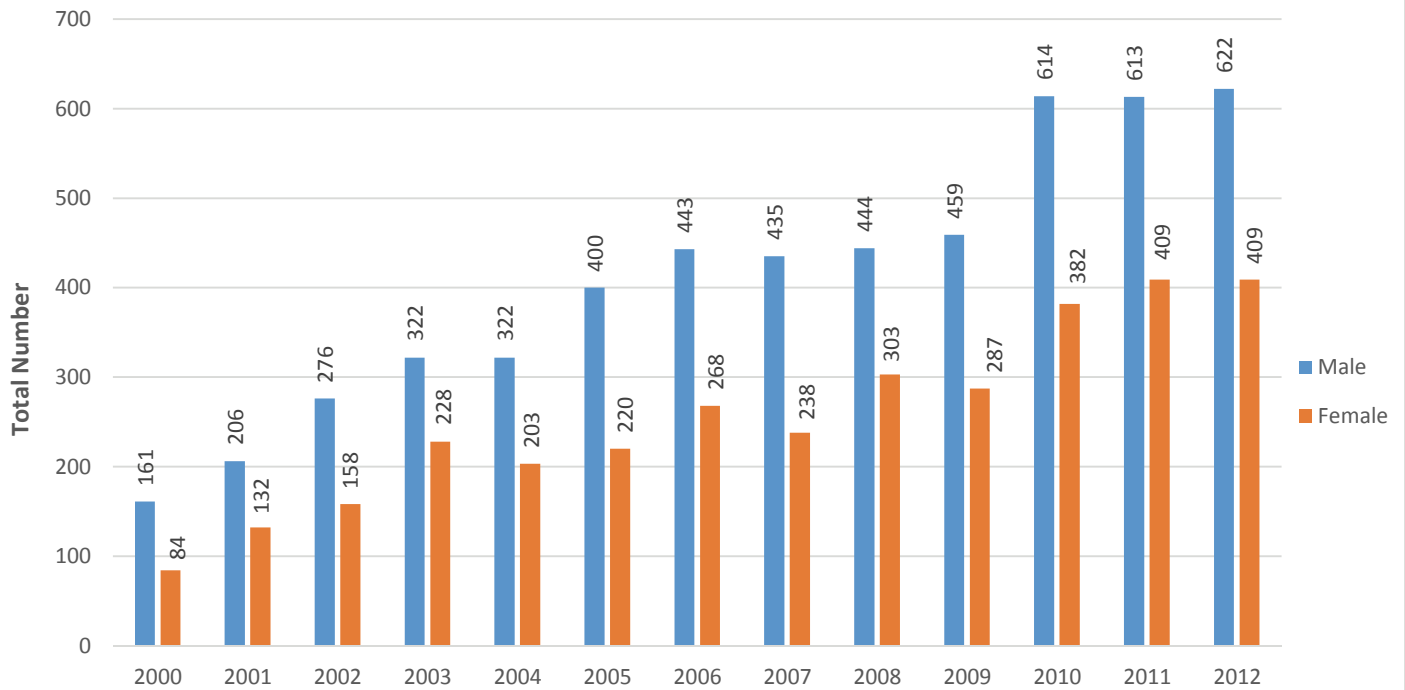
Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky Vital Statistics electronic death certificate file. Data for 2009-2012 are provisional and subject to change.

Kentucky Resident Age-Adjusted Drug Overdose Mortality Rates, 2000-2012



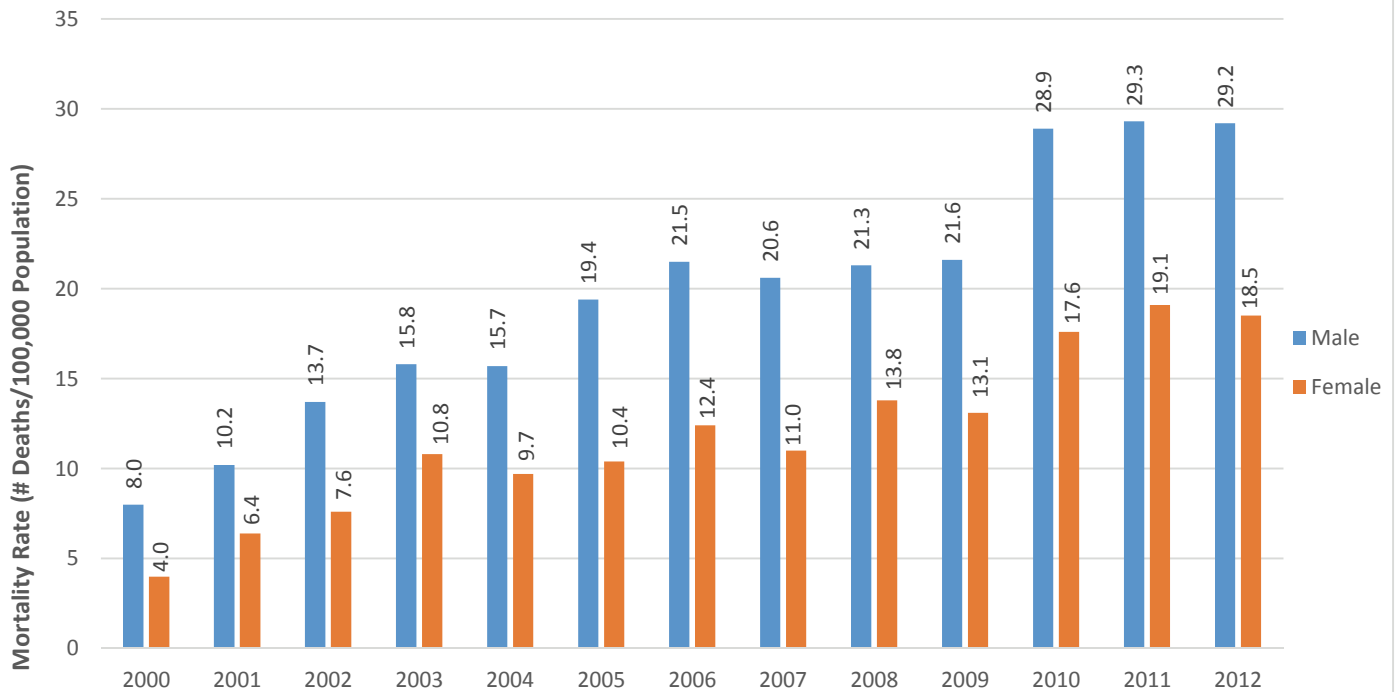
Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky Vital Statistics electronic death certificate file. Data for 2009-2012 are provisional and subject to change.

Kentucky Resident Drug Overdose Deaths by Gender, 2000-2012



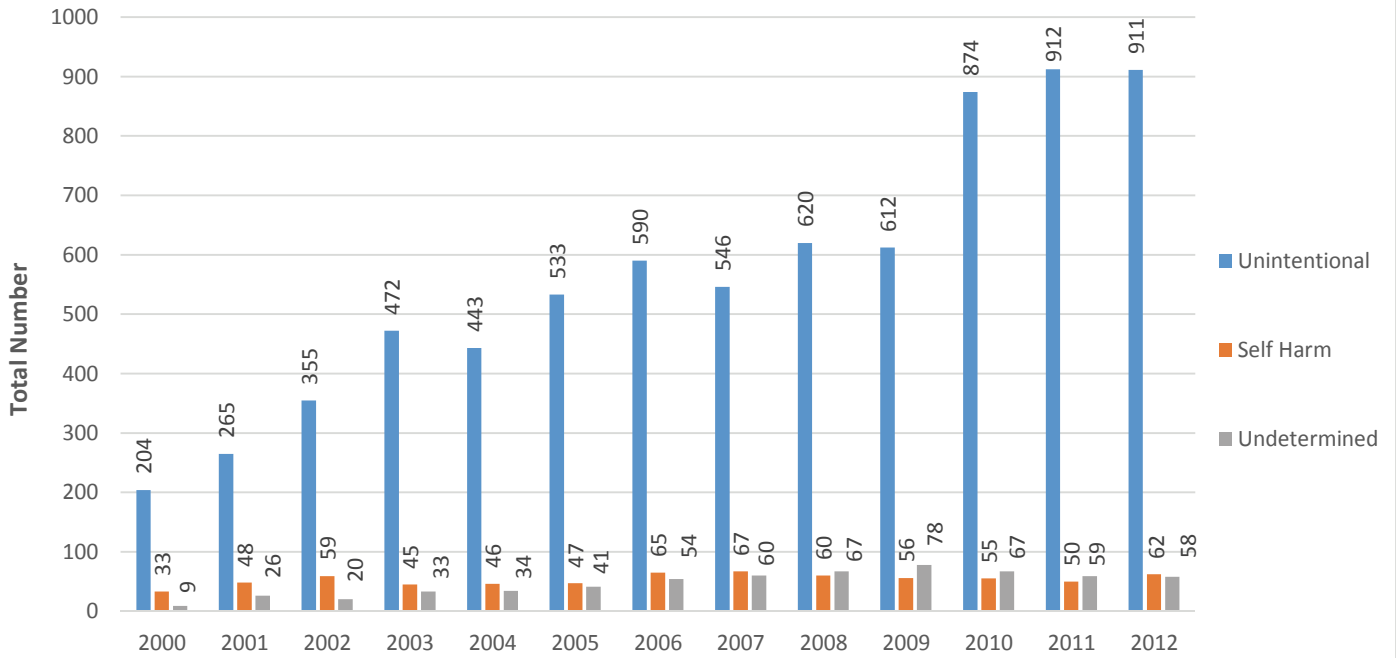
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Kentucky Resident Age-Adjusted Drug Overdose Mortality Rates by Gender, 2000-2012



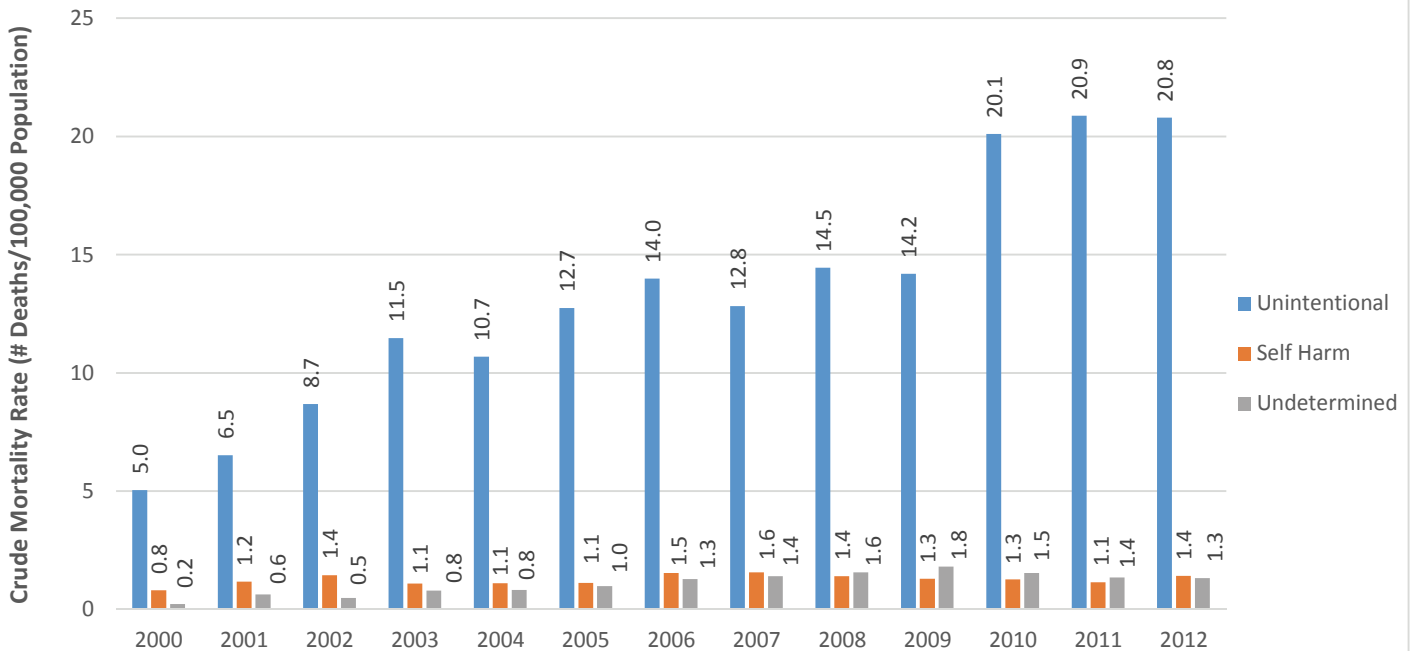
Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky Vital Statistics electronic death certificate file. Data for 2009-2012 are provisional and subject to change.

Kentucky Resident Drug Overdose Deaths by Intent, 2000-2012



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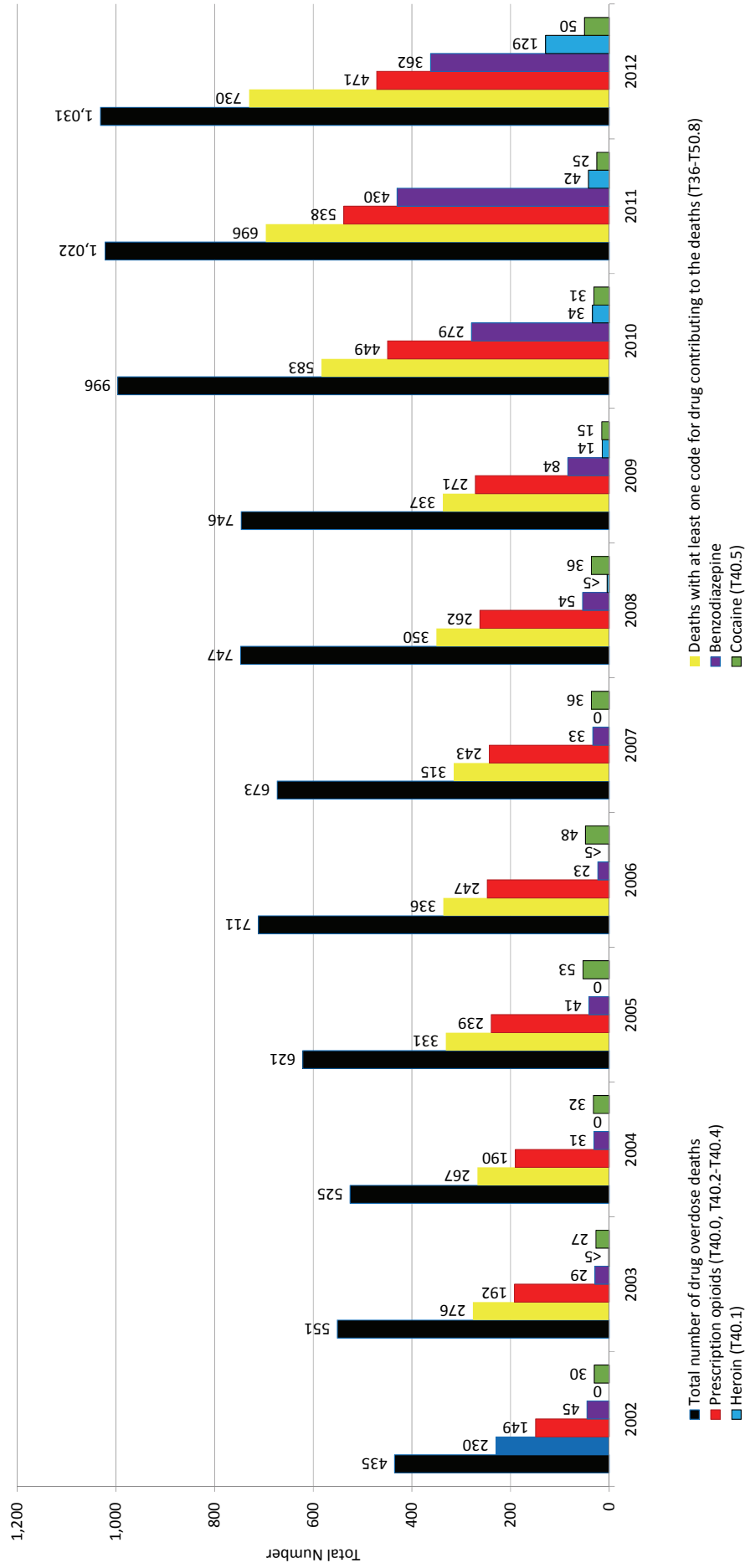
Kentucky Resident Crude Drug Overdose Mortality Rates by Intent, 2000-2012



Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky Vital Statistics electronic death certificate file. Data for 2009-2012 are provisional and subject to change.

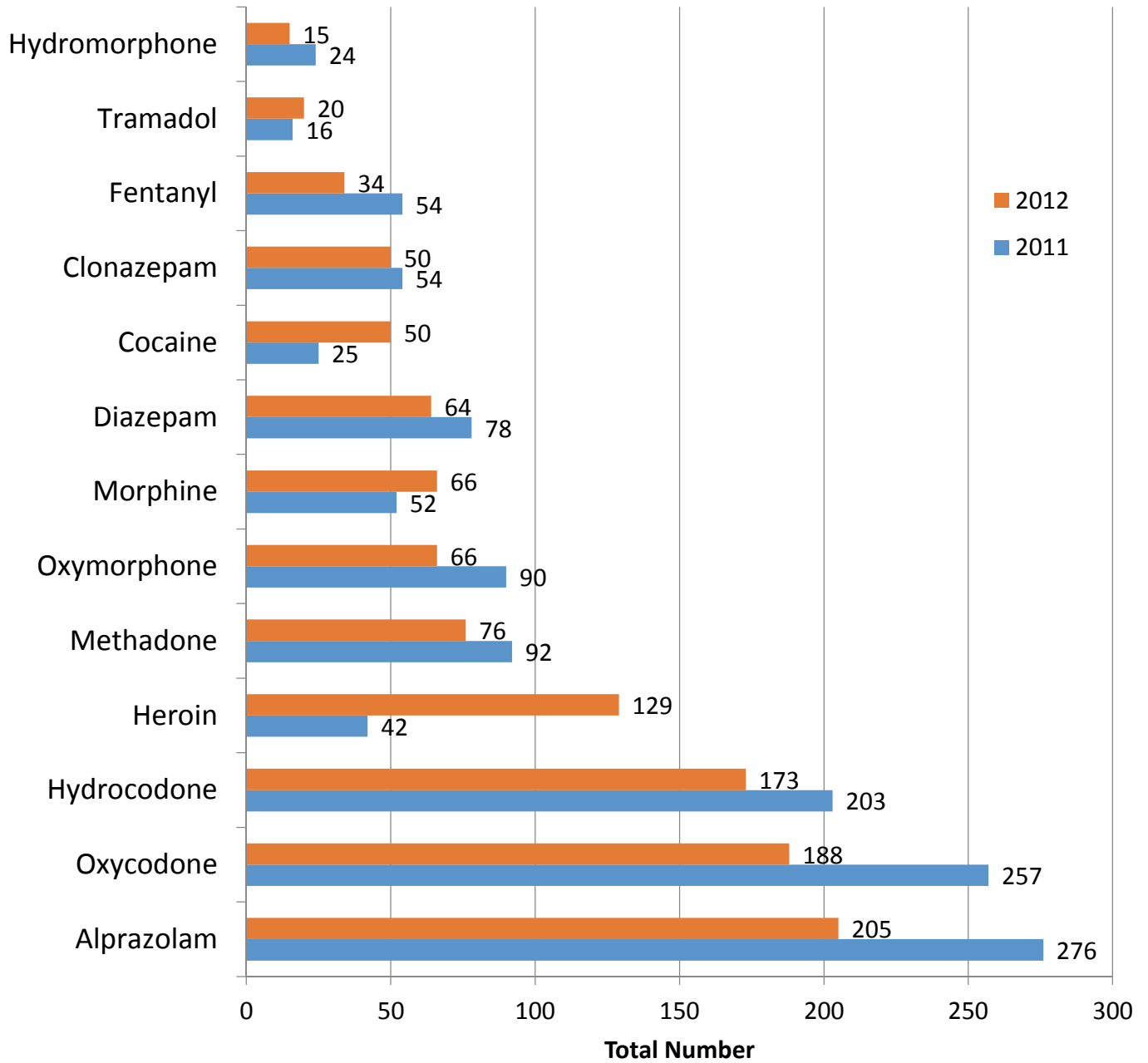
Kentucky Resident Drug Overdose Deaths by Contributing Drugs		Year													
		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012			
Contributing Drug	ICD-10 code														
Nonopioid analgesics	T39	16	25	23	28	33	27	36	9	7	7	8			
Antiepileptic, sedative-hypnotic, anti-Parkinsonism, antidepressant, and other psychotropic drugs, not elsewhere classified.	T42, T43	87	87	78	84	51	64	93	98	307	467	405			
Benzodiazepines	T42.4	45	29	31	41	23	33	54	84	279	430	362			
Narcotics and psychodysleptics not elsewhere classified	T36-T38.9, T40(.0-.9), T41, T44, T45(.0-.4), T45(.6-.9), T46-T50.8	188	229	231	300	296	282	299	312	522	656	677			
Opiates/opioids	T40(.0-.4)	149	193	190	239	248	243	265	285	480	568	569			
Heroin	T40.1	0	1	0	0	1	0	4	14	34	42	129			
Pharmaceutical Opioids	T40.0, T40(.2-.4)	149	192	190	239	247	243	262	271	449	538	471			
Methadone	T40.3	73	116	118	136	126	106	89	53	96	95	76			
Cocaine	T40.5	30	27	32	53	48	36	36	15	31	25	50			
Other and unspecified narcotics	T40.6	22	23	26	28	15	14	17	22	30	79	89			
Drugs not elsewhere classified or unspecified	T50.9	222	284	284	327	274	281	279	273	606	793	796			
	T50.9 Only	173	218	205	233	222	221	232	215	289	307	299			

Kentucky Resident Drug Overdose Deaths by Contributing Drugs, 2000-2012



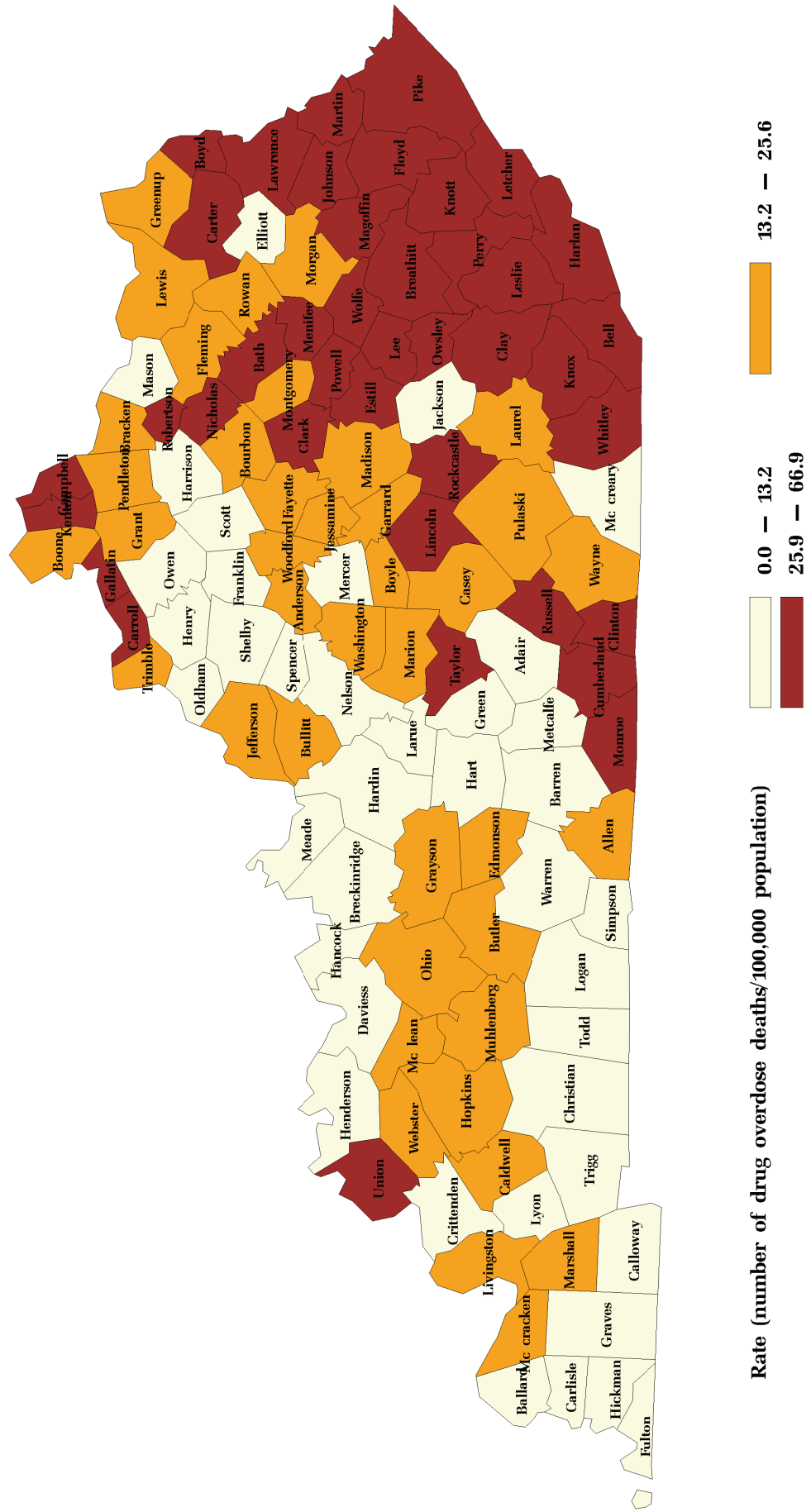
Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky Vital Statistics electronic death certificate file. Data for 2009-2012 are provisional and subject to change.

Occurrences of Specific Drugs among the Contributing Causes for Kentucky Resident Drug Overdose Deaths, 2011-2012



Produced by the Kentucky Injury Prevention and Research Center, November 2013. Data source: Kentucky Vital Statistics electronic death certificate file. Data for 2009-2012 are provisional and subject to change.

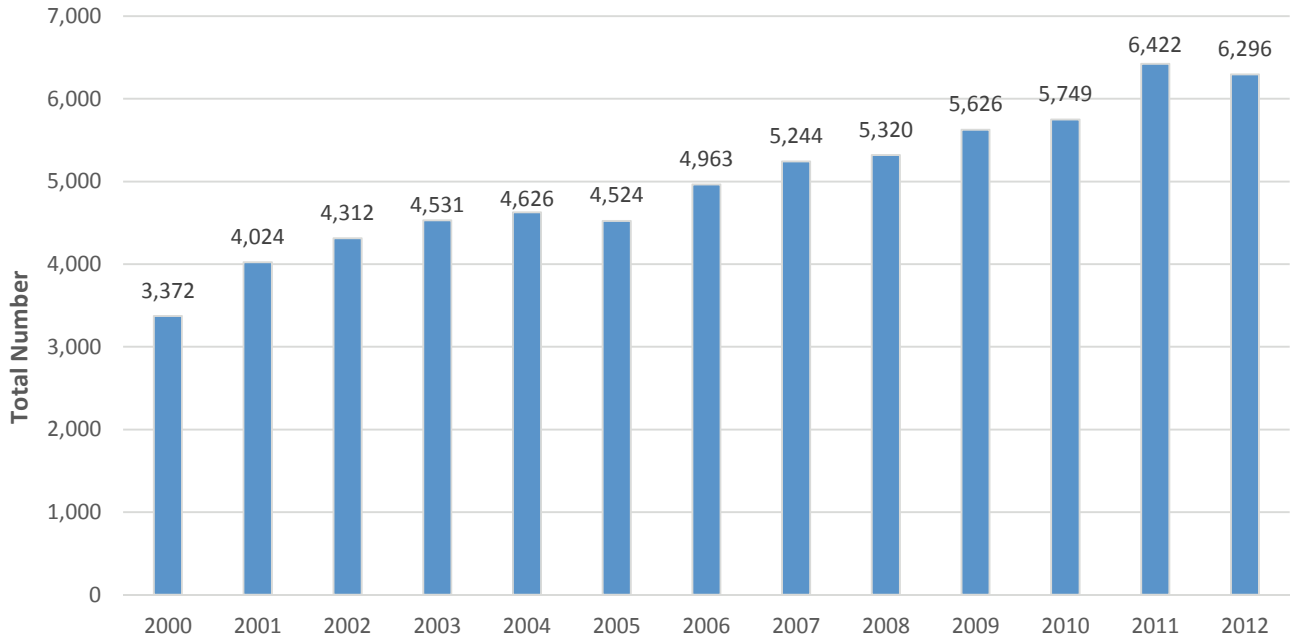
Kentucky Resident Drug Overdose Death Rates, 2008 – 2012



KIPRC, 2013

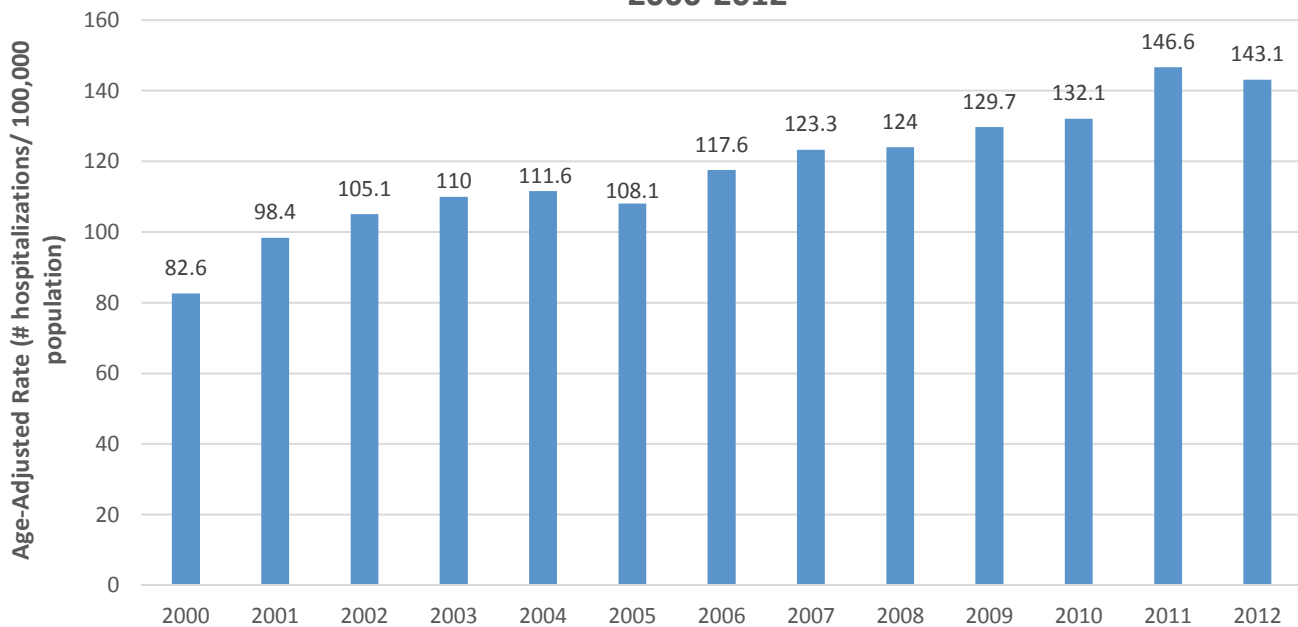
**Drug Overdose
Hospitalizations
2000-2012**

Kentucky Resident Drug Overdose Hospitalizations, 2000-2012



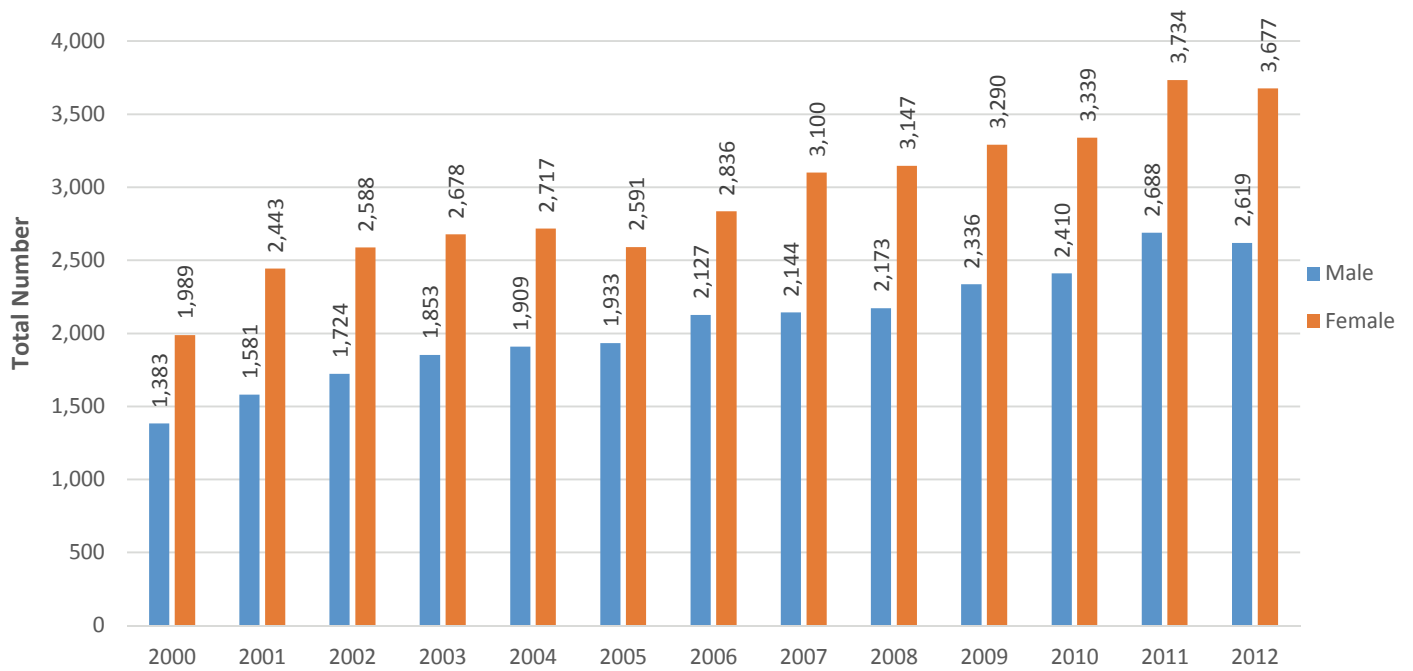
Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky inpatient hospitalization discharge data, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

Kentucky Resident Age-Adjusted Drug Overdose Hospitalization Rates, 2000-2012



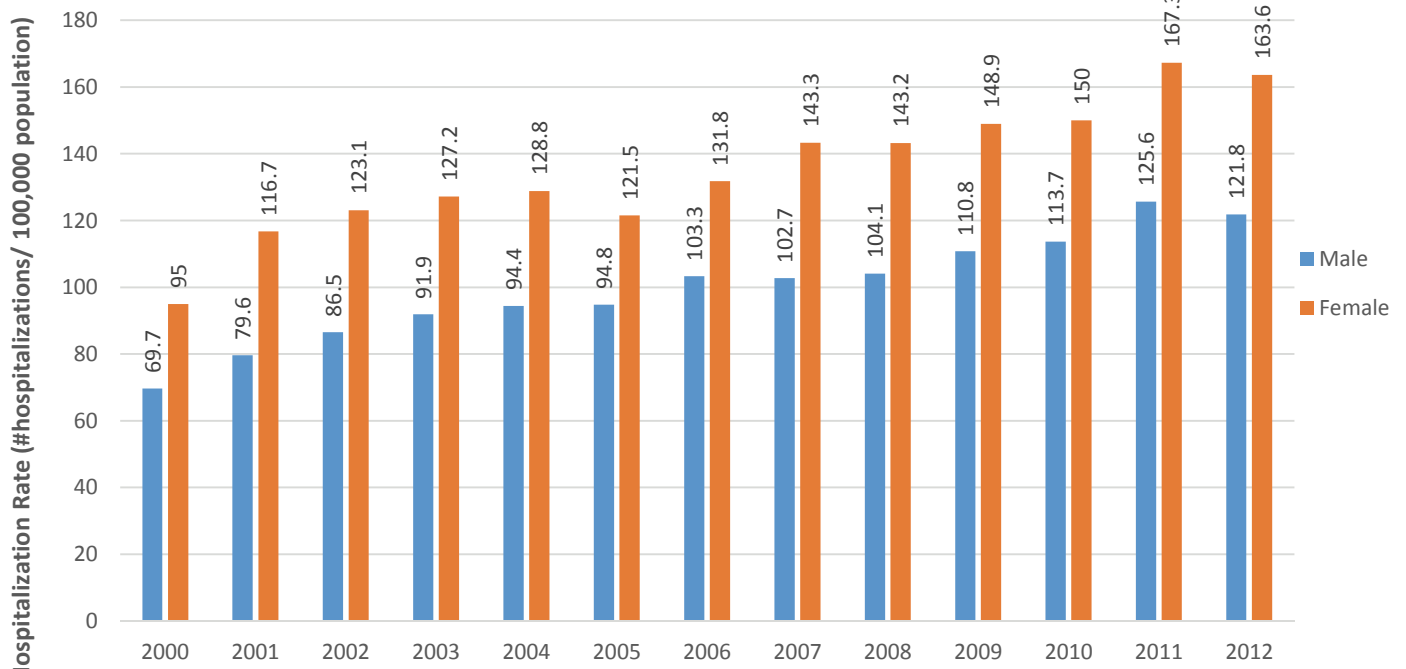
Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky inpatient hospitalization discharge data, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

Kentucky Resident Drug Overdose Hospitalizations by Gender, 2000-2012



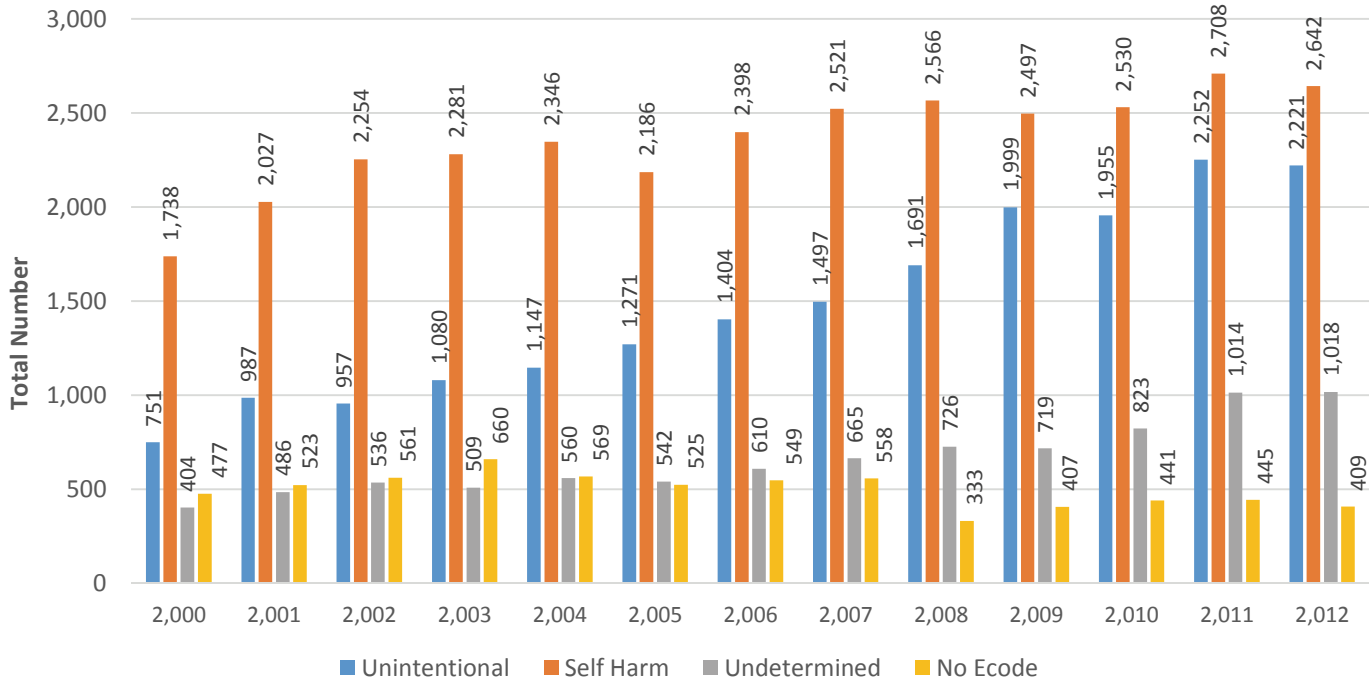
Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky inpatient hospitalization discharge data, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

Kentucky Resident Age-Adjusted Drug Overdose Hospitalization Rates by Gender, 2000-2012



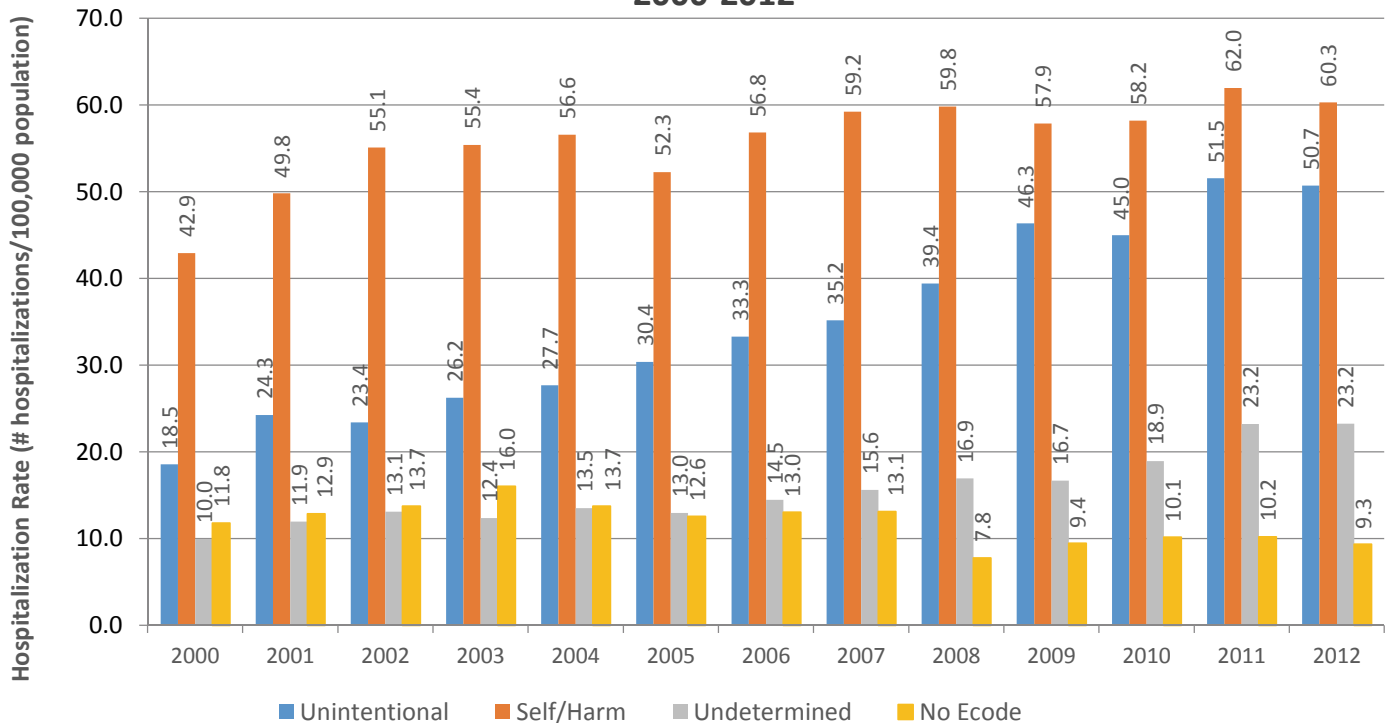
Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky inpatient hospitalization discharge data, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

Kentucky Resident Drug Overdose Hospitalizations by Intent, 2000-2012



Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky inpatient hospitalization discharge data, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

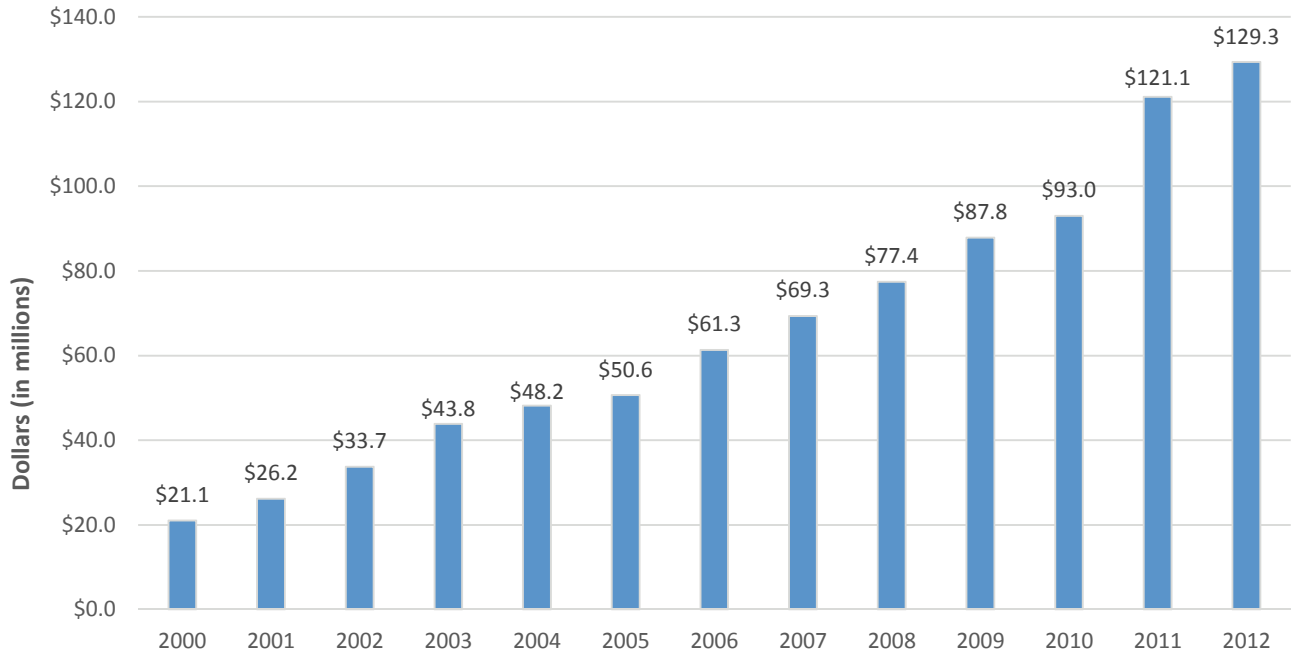
Kentucky Resident Drug Overdose Hospitalization Rates by Intent, 2000-2012



Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky inpatient hospitalization discharge data, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

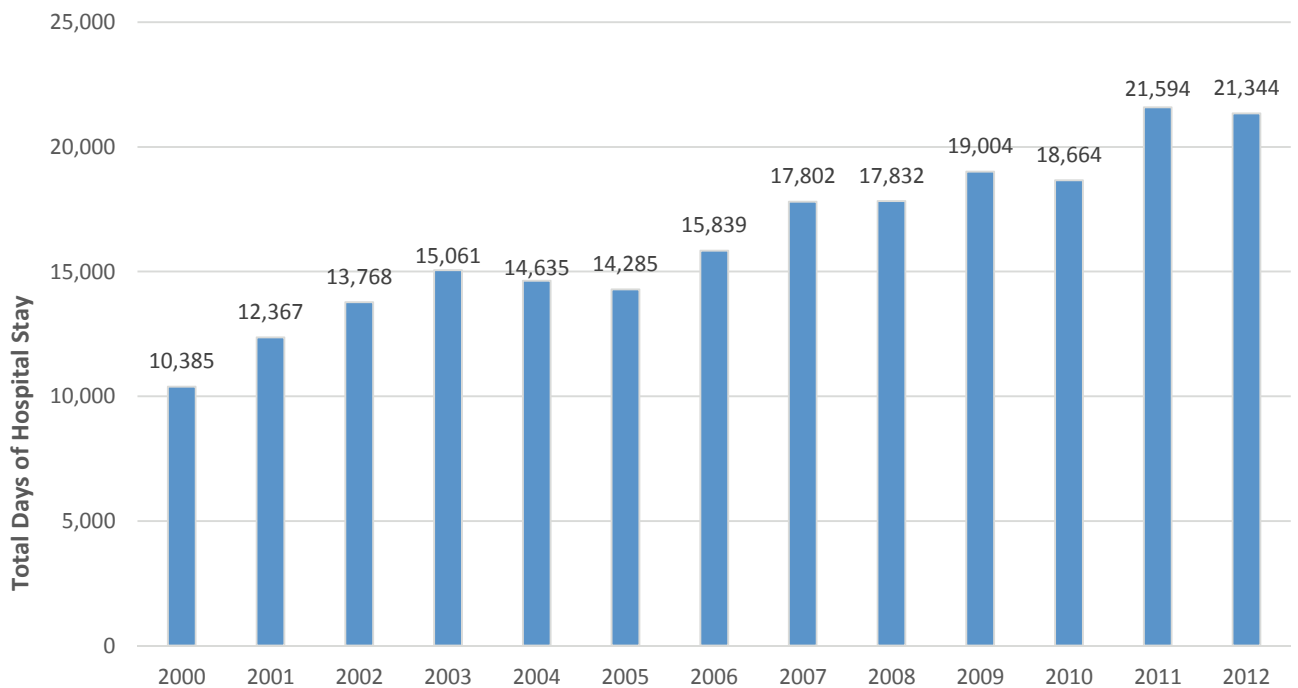
Kentucky Resident Drug Overdose Related Hospitalizations	ICD-9-CM Codes	Year												
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
DRUG		3,372	4,024	4,312	4,531	4,626	4,524	4,963	5,244	5,320	5,626	5,749	6,422	6,296
Nonopioid analgesics		590	644	714	723	740	731	830	877	875	906	826	880	793
4-Aminophenol		351	379	404	414	430	438	562	571	587	608	546	587	496
Opiates/opioids		339	519	591	677	731	728	957	988	1,065	1,259	1,298	1,668	1,637
Heroin		8	10	16	21	14	11	41	30	39	62	48	62	170
Pharmaceutical Opioids		332	509	577	658	718	717	921	961	1,030	1,201	1,254	1,610	1,483
Methadone		31	67	147	184	206	163	215	226	201	190	189	194	168
Cocaine		90	118	112	73	75	81	85	93	72	81	104	213	217
Antidepressants		1,781	2,275	2,389	2,487	2,529	2,461	2,667	2,849	2,973	3,032	3,044	3,479	3,250
Benzodiazepines		793	1,120	1,181	1,181	1,245	1,196	1,386	1,511	1,561	1,661	1,645	1,885	1,686
Psychostimulants		63	93	93	96	107	106	102	94	84	111	112	203	180
Anticoagulants		87	67	74	90	110	90	90	106	110	125	135	80	77
Other Unspecified		1,755	1,972	2,190	2,198	2,231	2,212	2,489	2,546	2,769	2,845	3,009	3,369	3,410

Total Charges for Drug Overdose Hospitalizations, 2000-2012



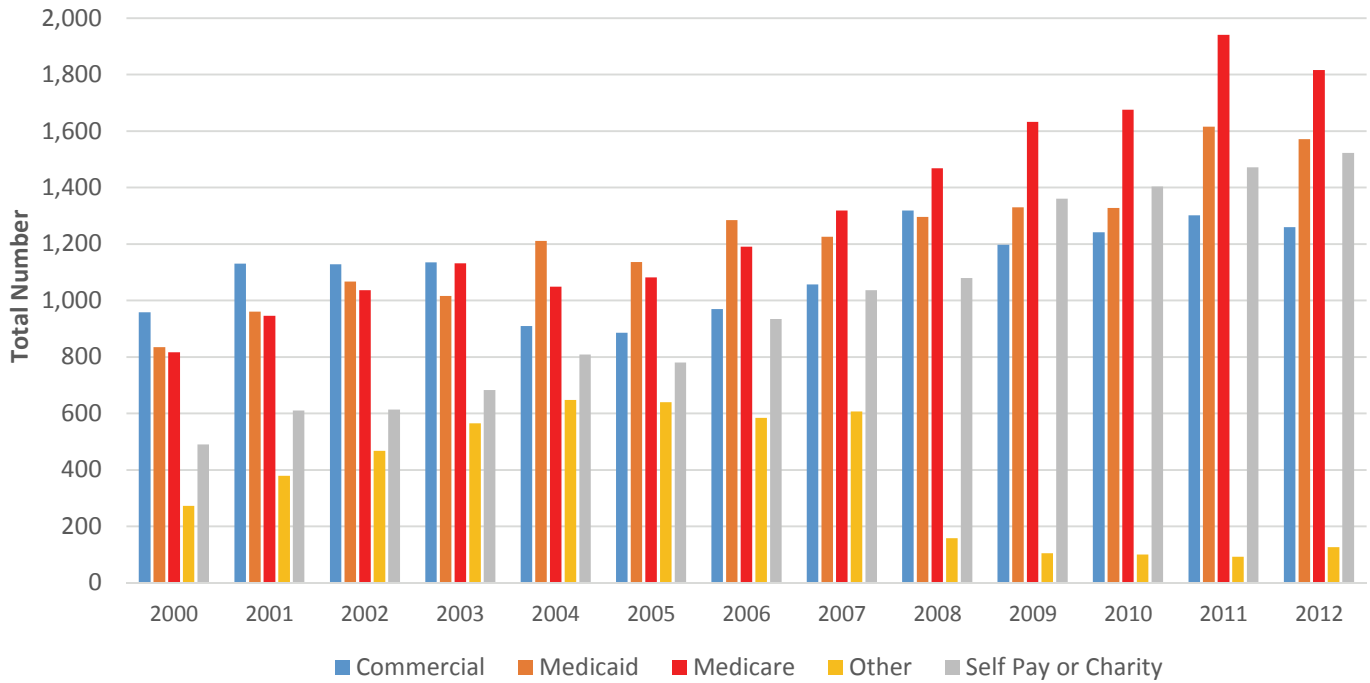
Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky inpatient hospitalization discharge data, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

Drug Overdose Hospitalizations by Total Length of Stay, 2000-2012



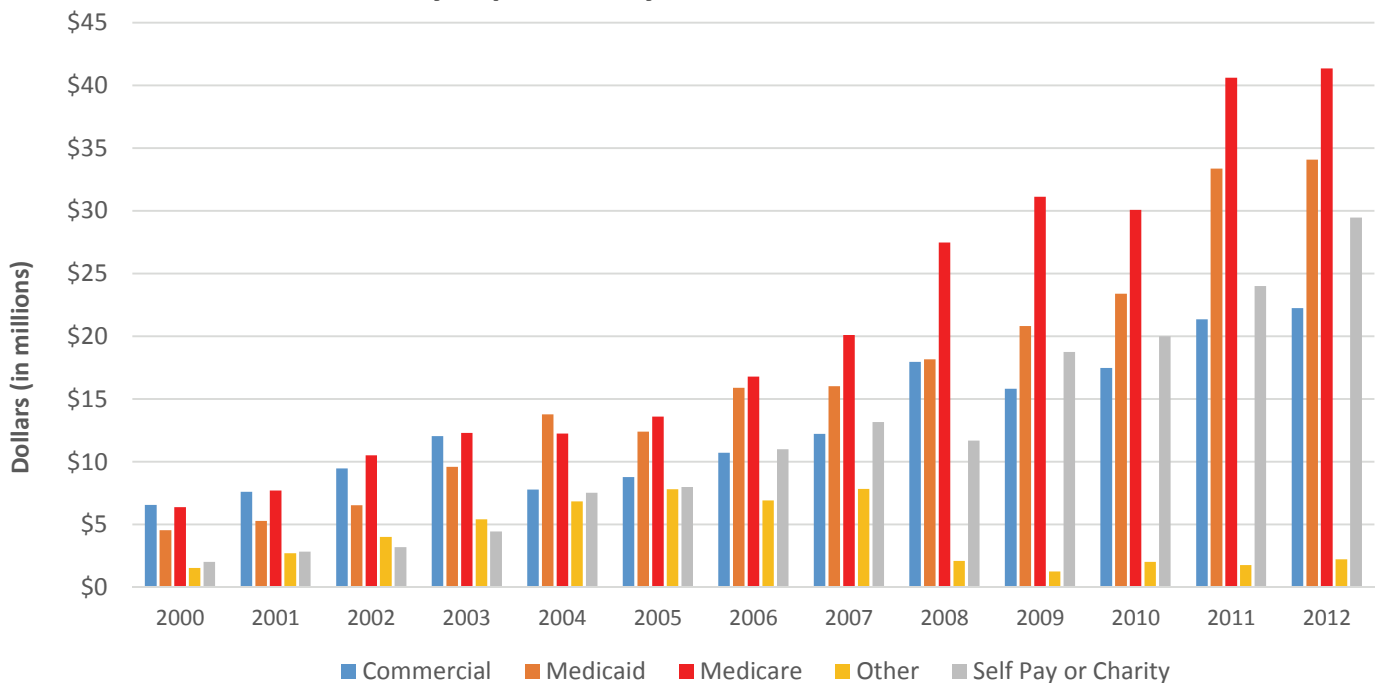
Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky inpatient hospitalization discharge data, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

Kentucky Resident Drug Overdose Hospitalizations by Expected Payer, 2000-2012



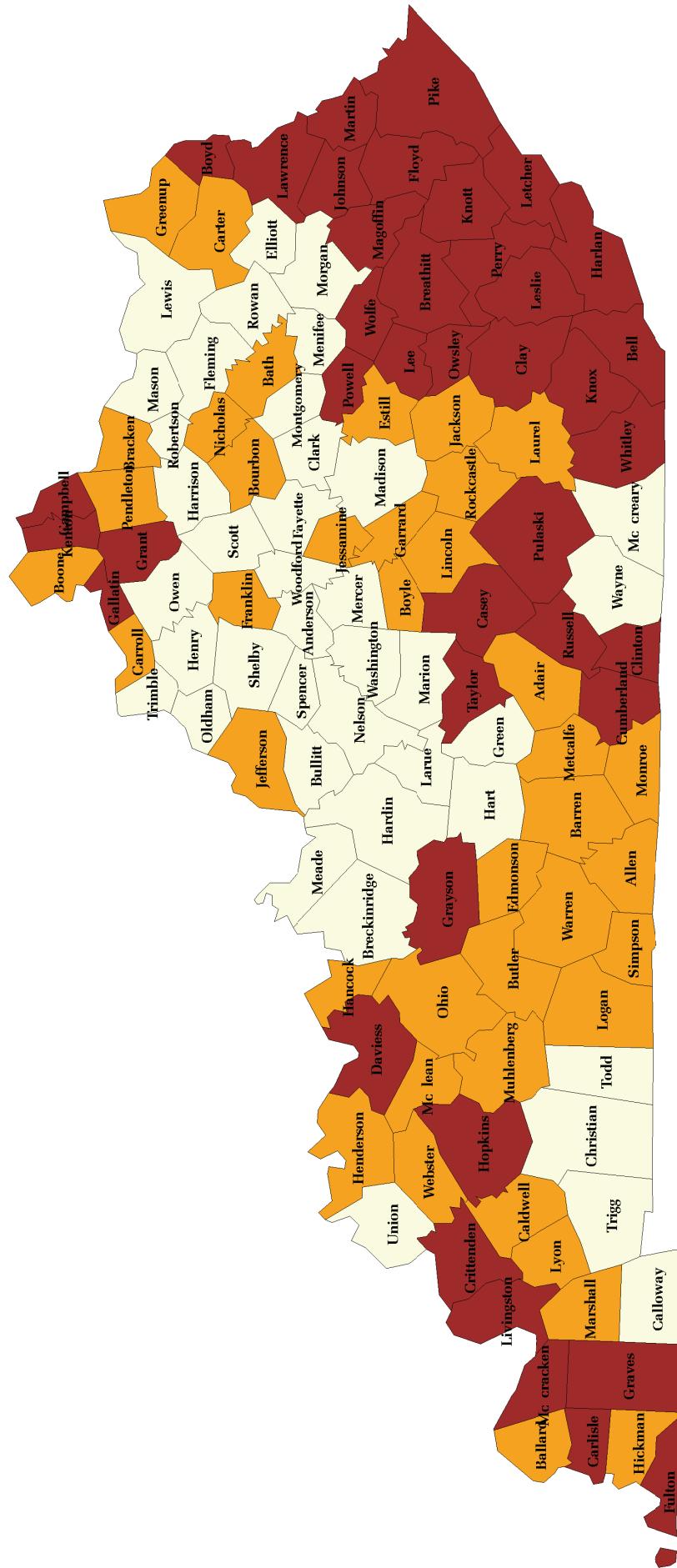
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Kentucky Resident Total Drug Overdose Hospitalization Charges by Expected Payer, 2000-2012



Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky inpatient hospitalization discharge data, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

Kentucky Resident Drug Overdose Hospitalization Rates, 2008 – 2012

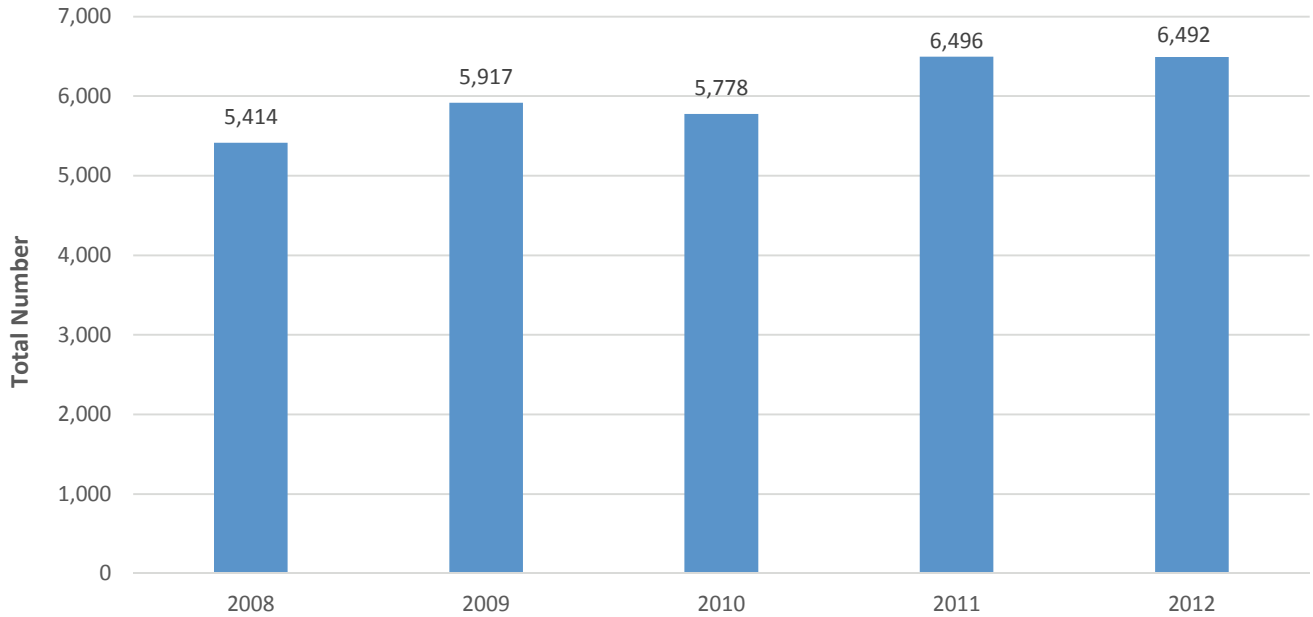


Rate (number of visits/100,000 population) 107.8 – 142.4 187.8 – 243.1 243.1 – 331.9 331.9 – 827.1

KIPRC, 2013

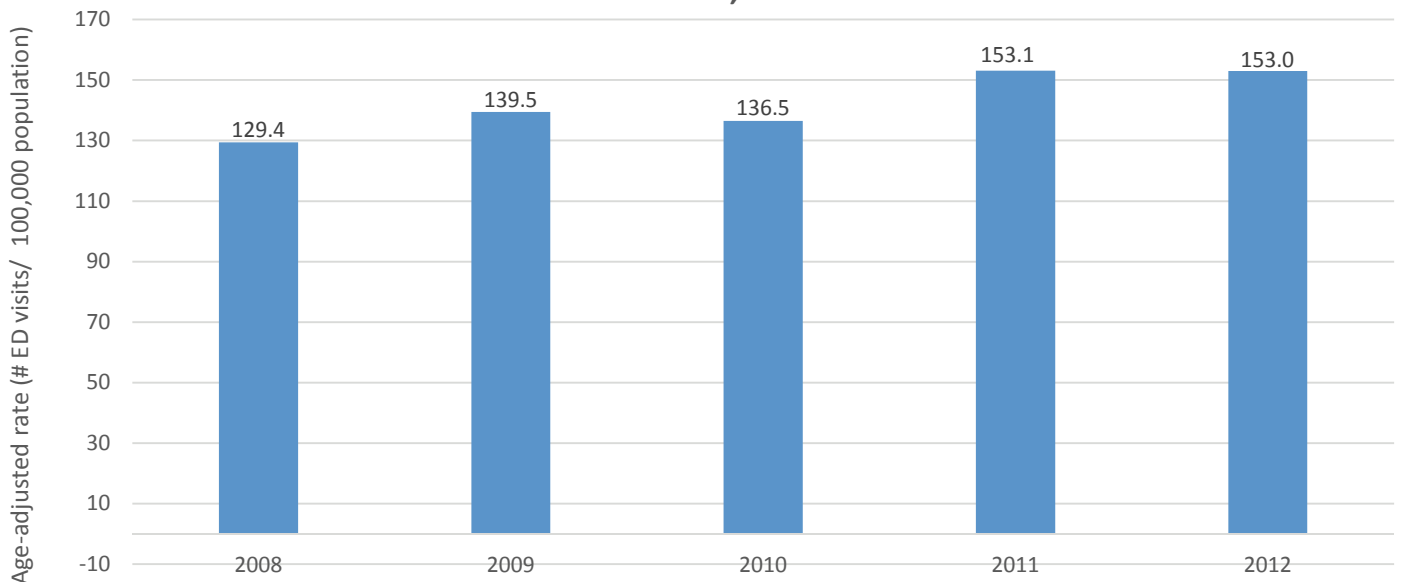
**Drug Overdose
Emergency Department Visits
2008-2012**

Kentucky Resident Drug Overdose Emergency Department Visits, 2008-2012



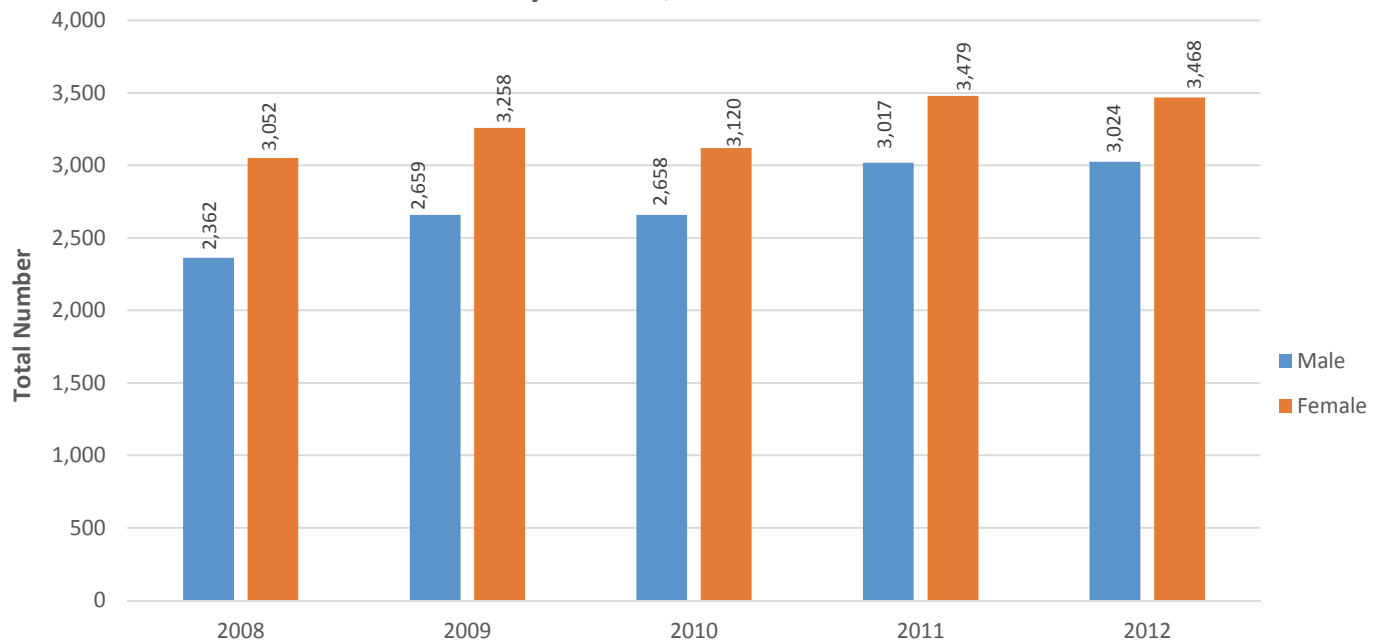
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Kentucky Resident Age-Adjusted Drug Overdose Emergency Department Visit Rates, 2008-2012



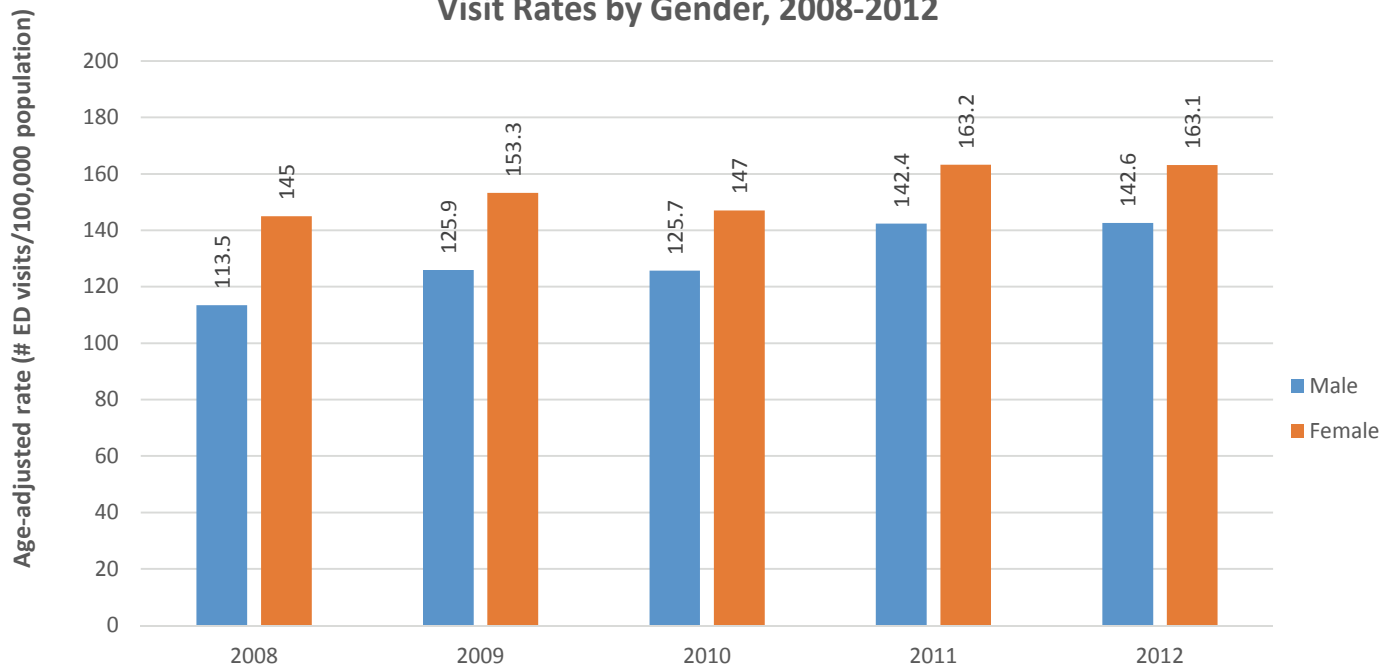
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Kentucky Resident Drug Overdose Emergency Department Visits by Gender, 2008-2012



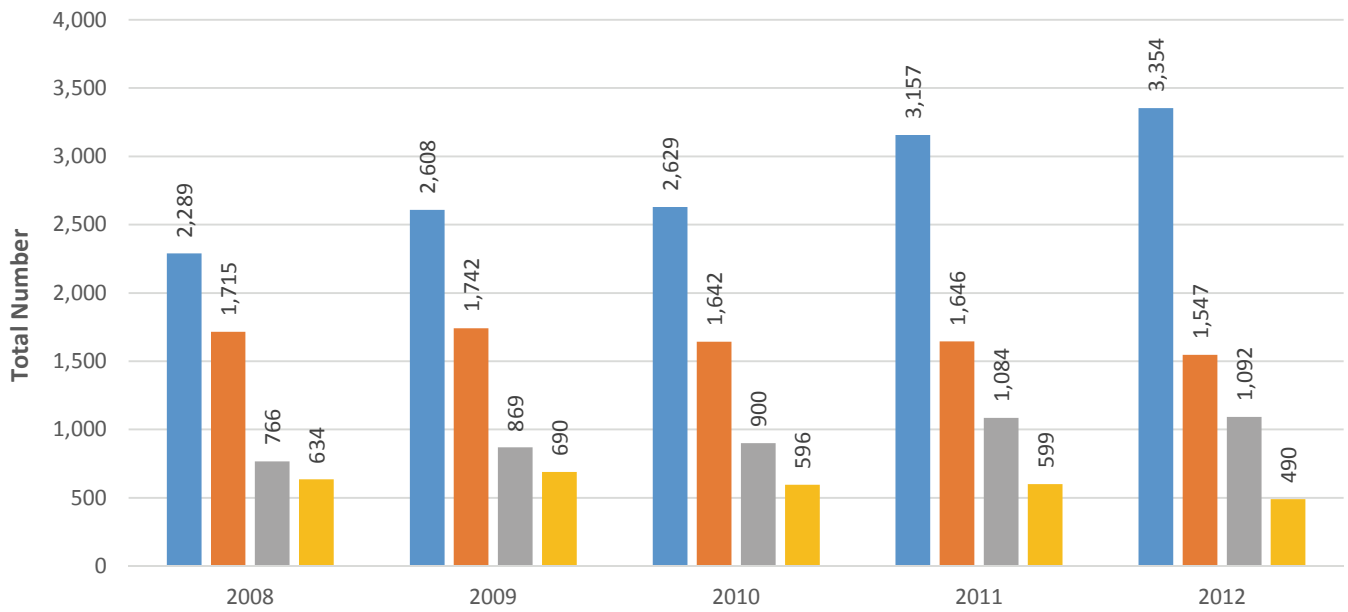
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Kentucky Resident Age-Adjusted Drug Overdose Emergency Department Visit Rates by Gender, 2008-2012



Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky Outpatient Services Database, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

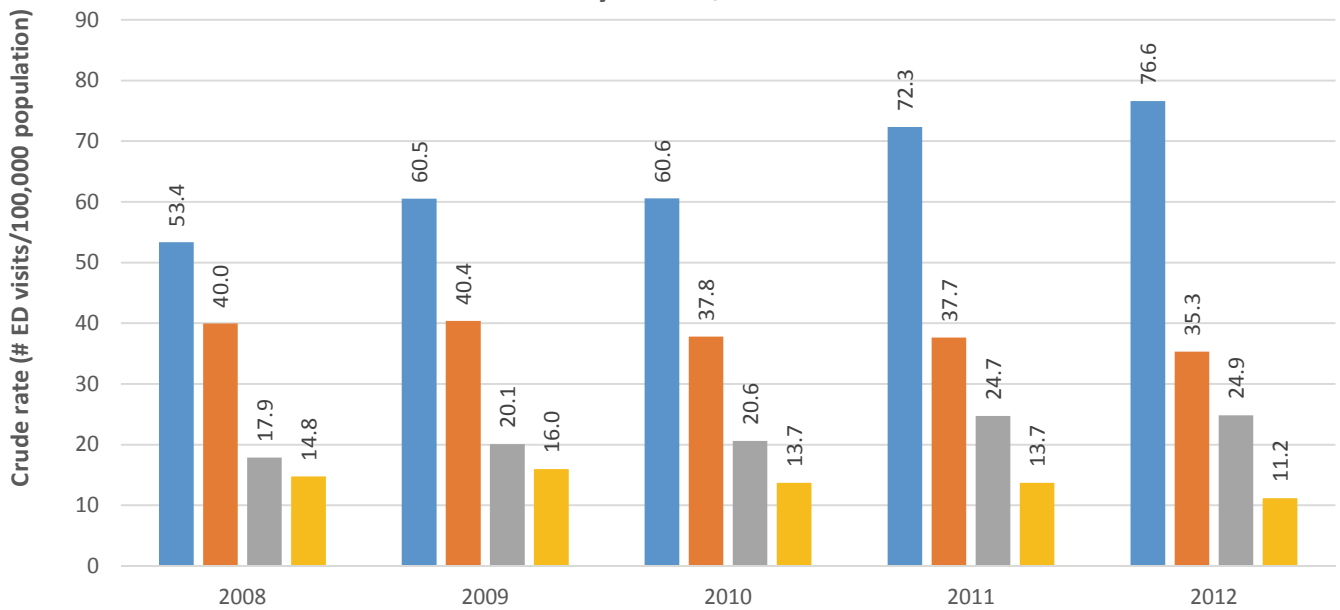
Kentucky Resident Drug Overdose Emergency Department Visits by Intent, 2008-2012



Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky Outpatient Services Database, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

■ Unintentional ■ Self Harm ■ Undetermined ■ No Ecode

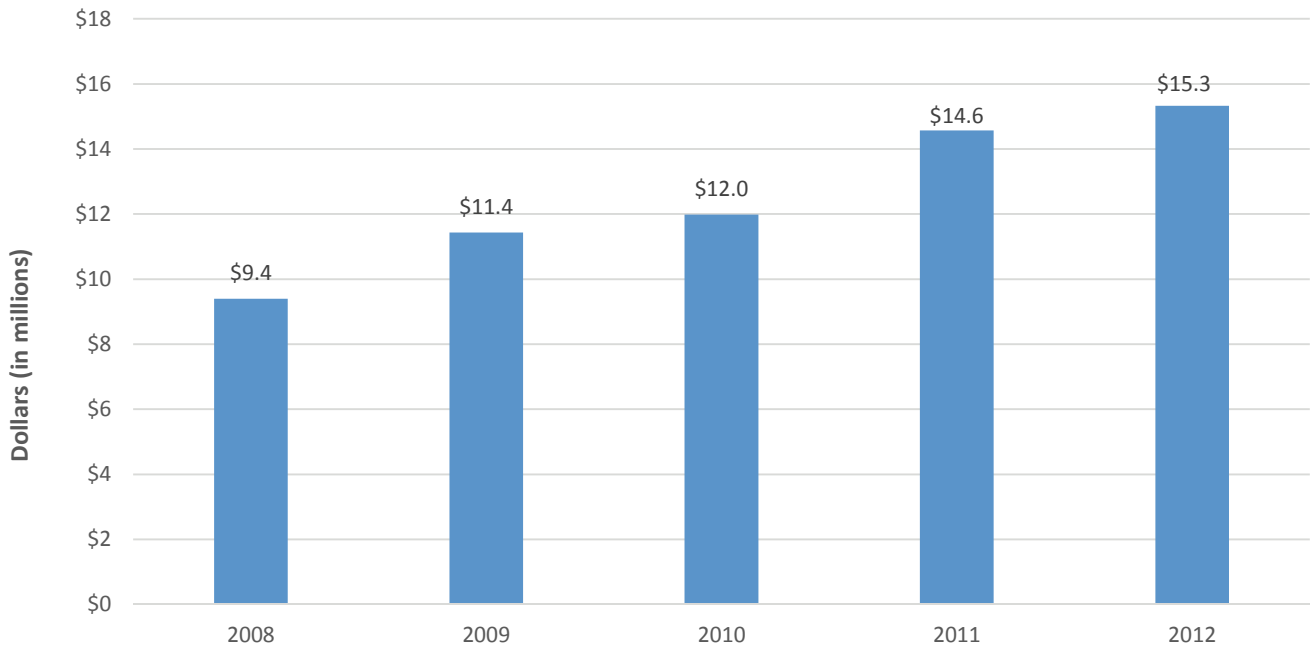
Kentucky Resident Crude Drug Overdose Emergency Department Visit Rates by Intent, 2008-2012



Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky Outpatient Services Database, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

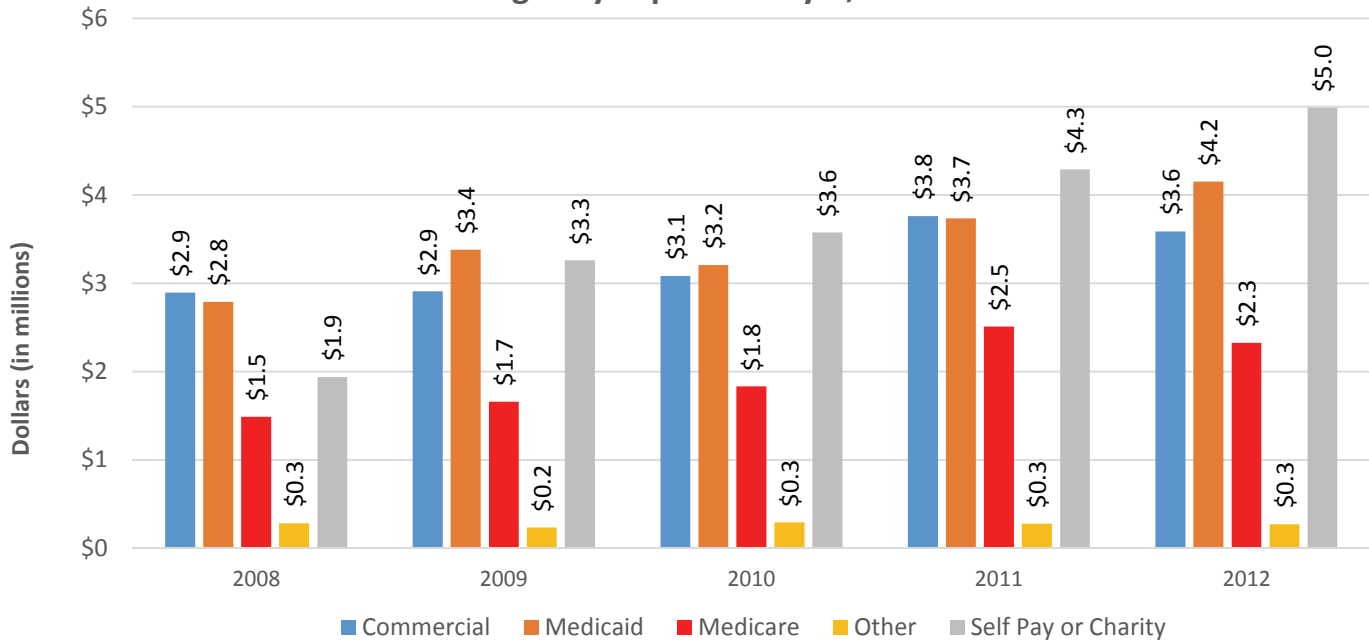
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Kentucky Resident Total Drug Overdose Emergency Department Visit Charges, 2008-2012



Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky Outpatient Services Database, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

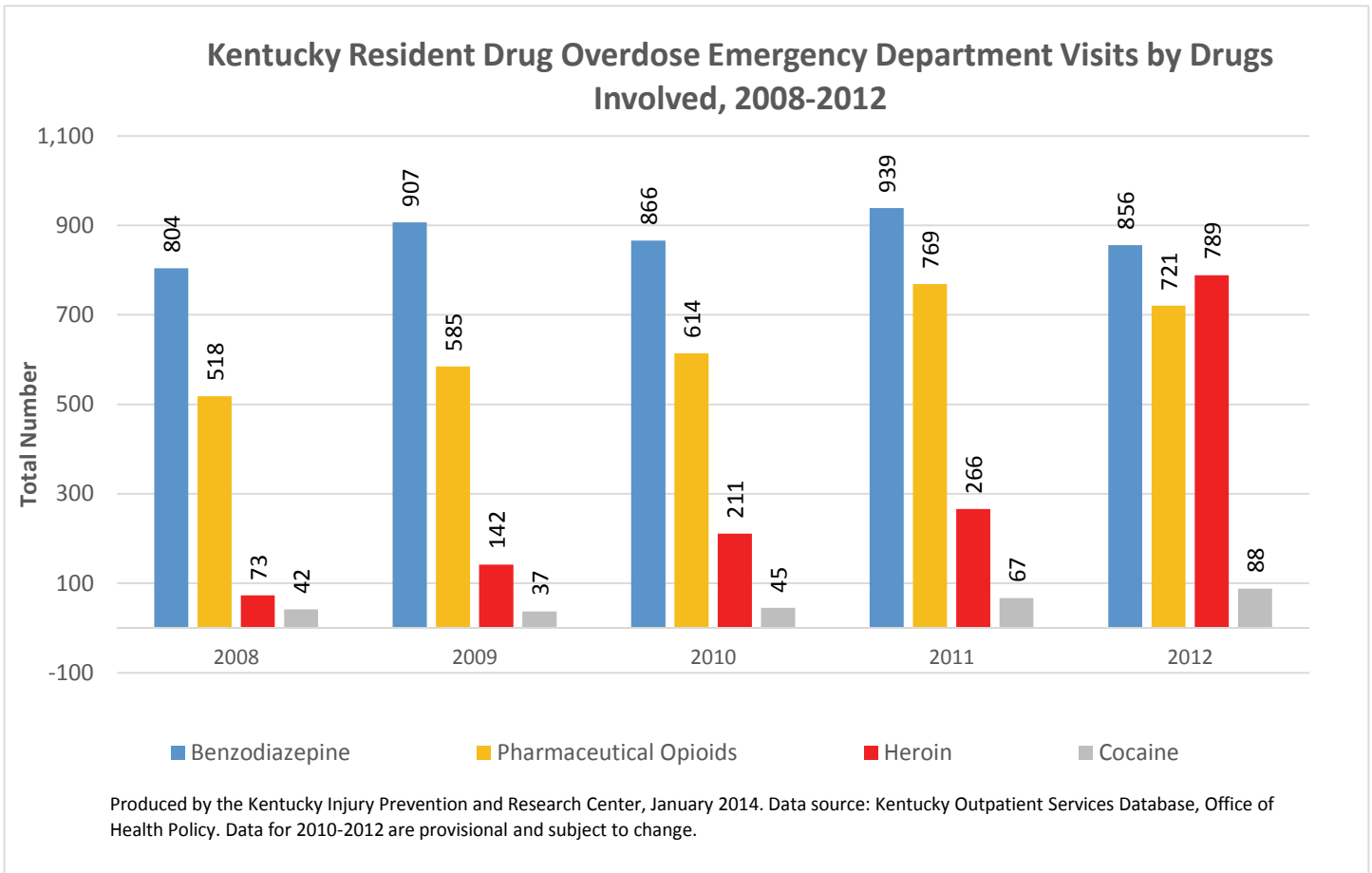
Kentucky Resident Total Drug Overdose Emergency Department Visit Charges by Expected Payer, 2008-2012



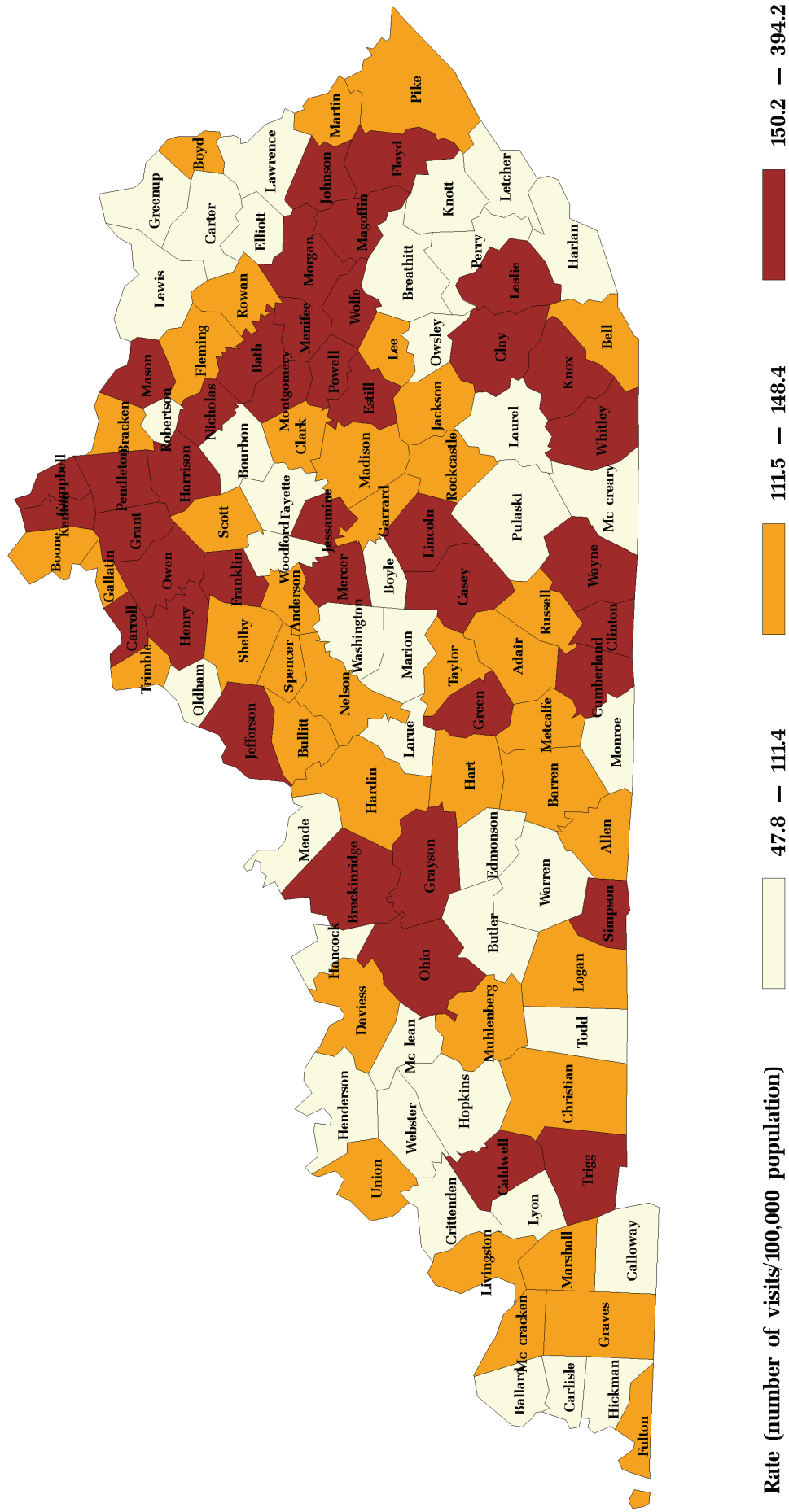
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Kentucky Resident Drug Overdose Related ED Visits		Year				
		2008	2009	2010	2011	2012
DRUG Involved		5,414	5,917	5,778	6,496	6,492
Nonopioid analgesics, Antipyretics, and Antirheumatics		805	831	776	764	737
4-Aminophenol derivatives		428	462	418	420	379
Opiates/opioids		590	725	816	1,026	1,488
Heroin		73	142	211	266	789
Pharmaceutical Opioids		518	585	614	769	721
Methadone		54	48	52	43	58
Cocaine		42	37	45	67	88
Antidepressants, barbiturates and other antiepileptics, sedative- hypnotics, and psychotropic drugs not elsewhere classified		2,033	2,179	2,075	2,320	2,200
Benzodiazepines		804	907	866	939	856
Psychostimulants with abuse potential including methamphetamine, MDMA (Ecstasy)		133	143	140	199	172
Anticoagulants		65	104	88	57	54
Other specified and unspecified drugs		3,195	3,500	3,455	3,864	3,651

For ICD-9-CM codes see Appendix A



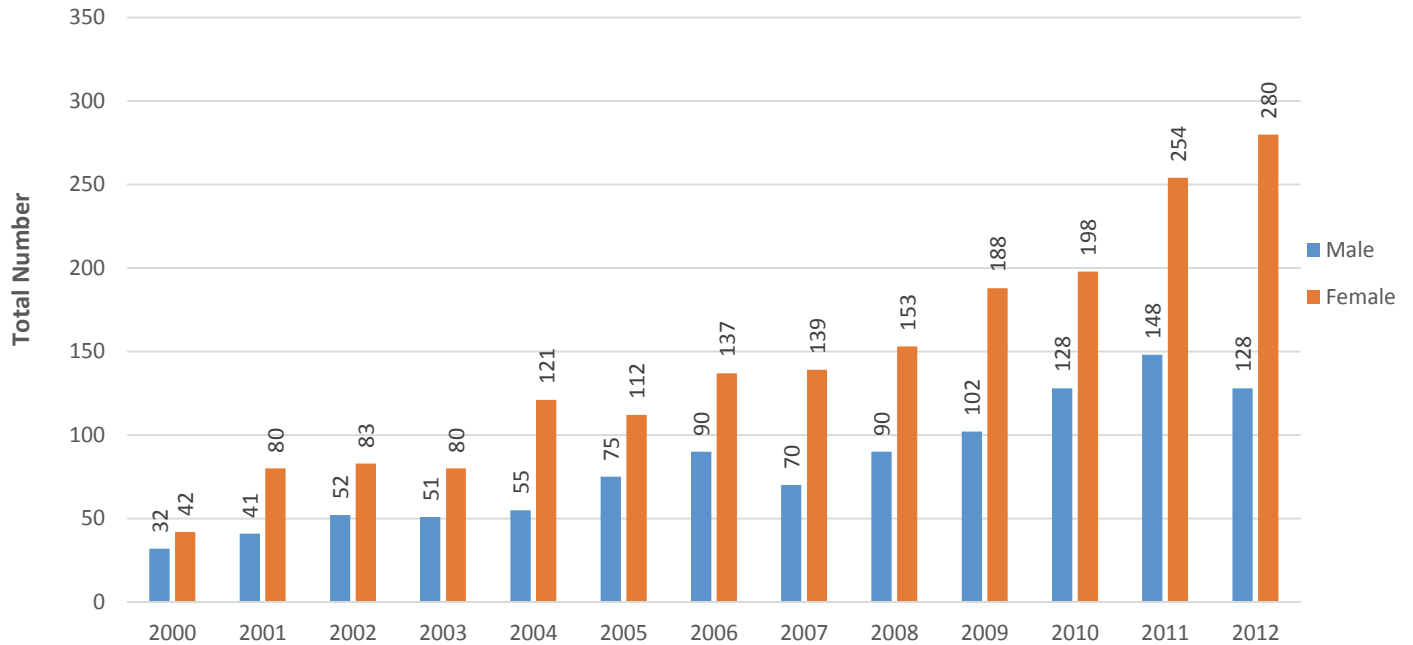
Kentucky Resident Drug Overdose Emergency Department Visit Rates, 2008–2012



KIPRC, 2013

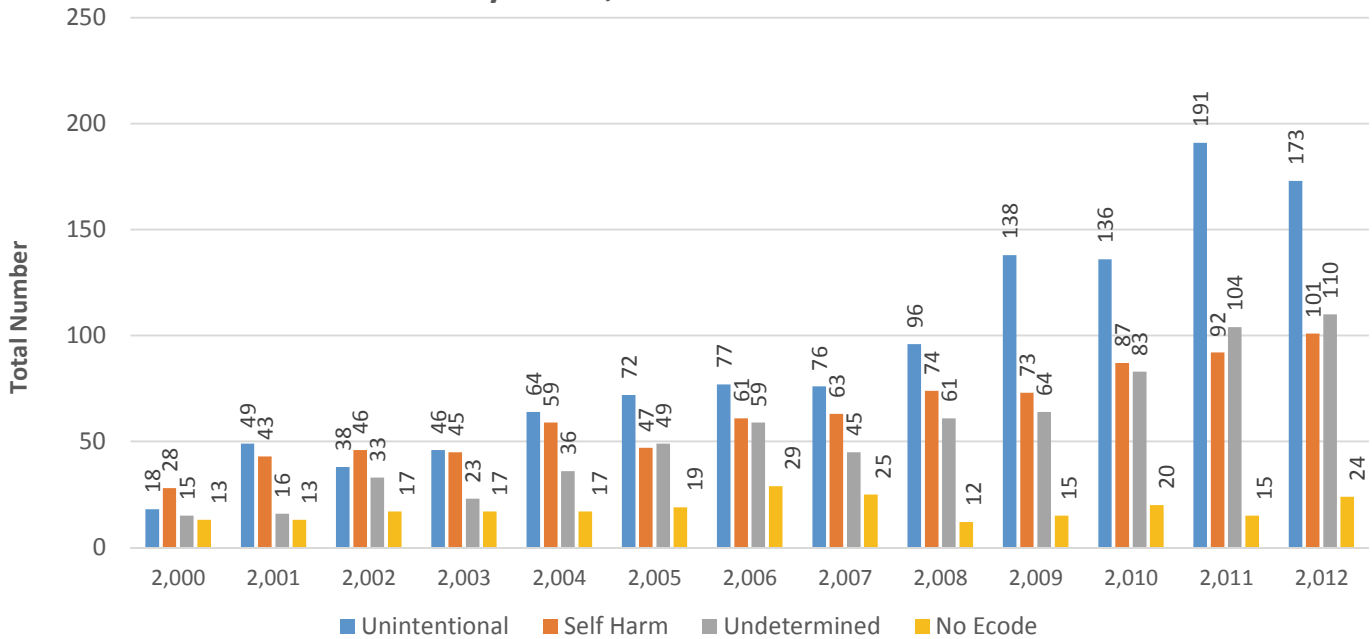
**Medicaid Recipient
Opiate Overdose
Hospitalizations and
Emergency Department Visits**

Medicaid Recipient Opiate Overdose Hospitalizations by Gender, 2000-2012



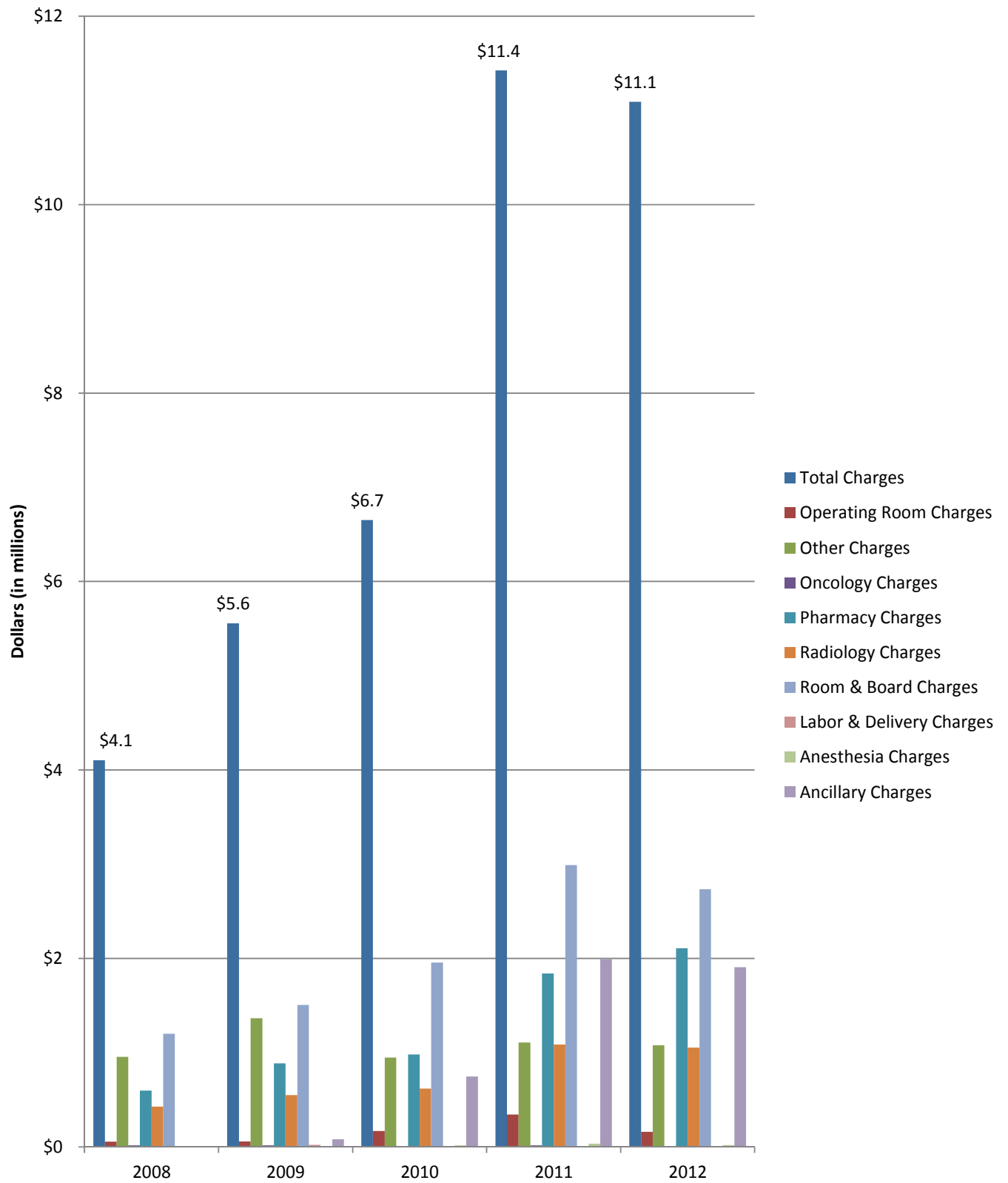
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Medicaid Recipient Opiate Overdose Hospitalizations by Intent, 2000-2012



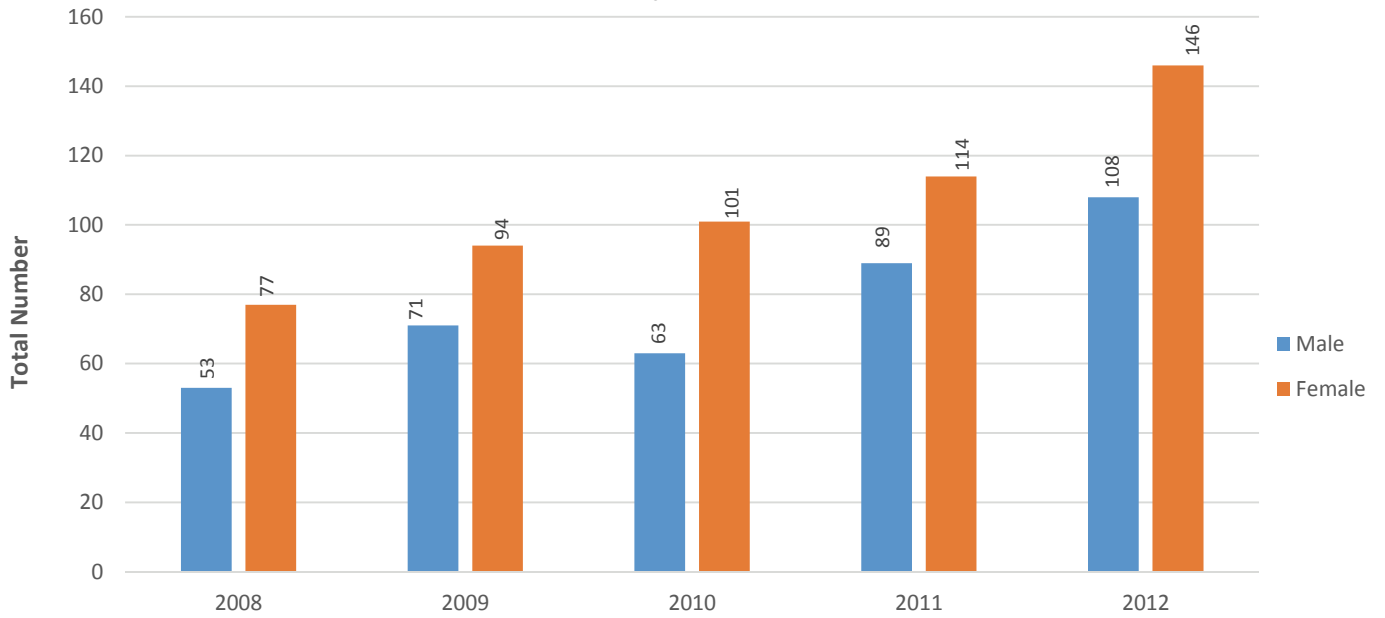
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Medicaid Recipient Total Opiate Overdose Inpatient Hospitalization Charges, 2008-2012



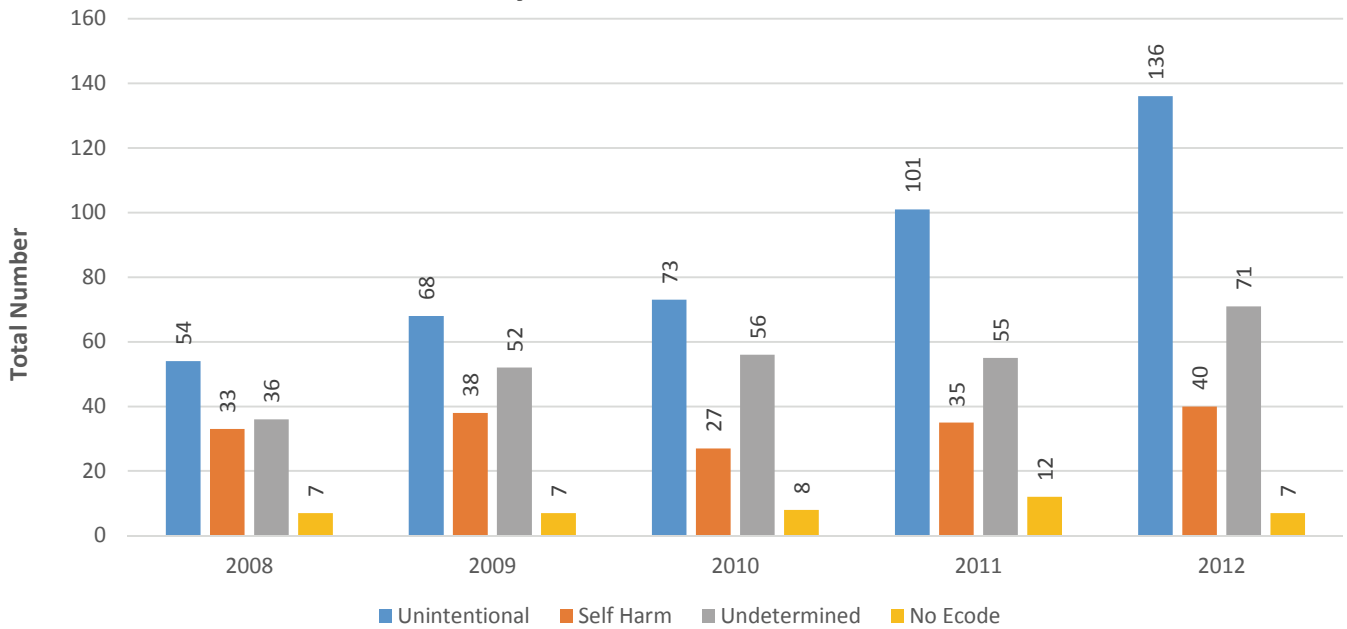
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Medicaid Recipient Opiate Overdose Emergency Department Visits by Gender, 2008-2012



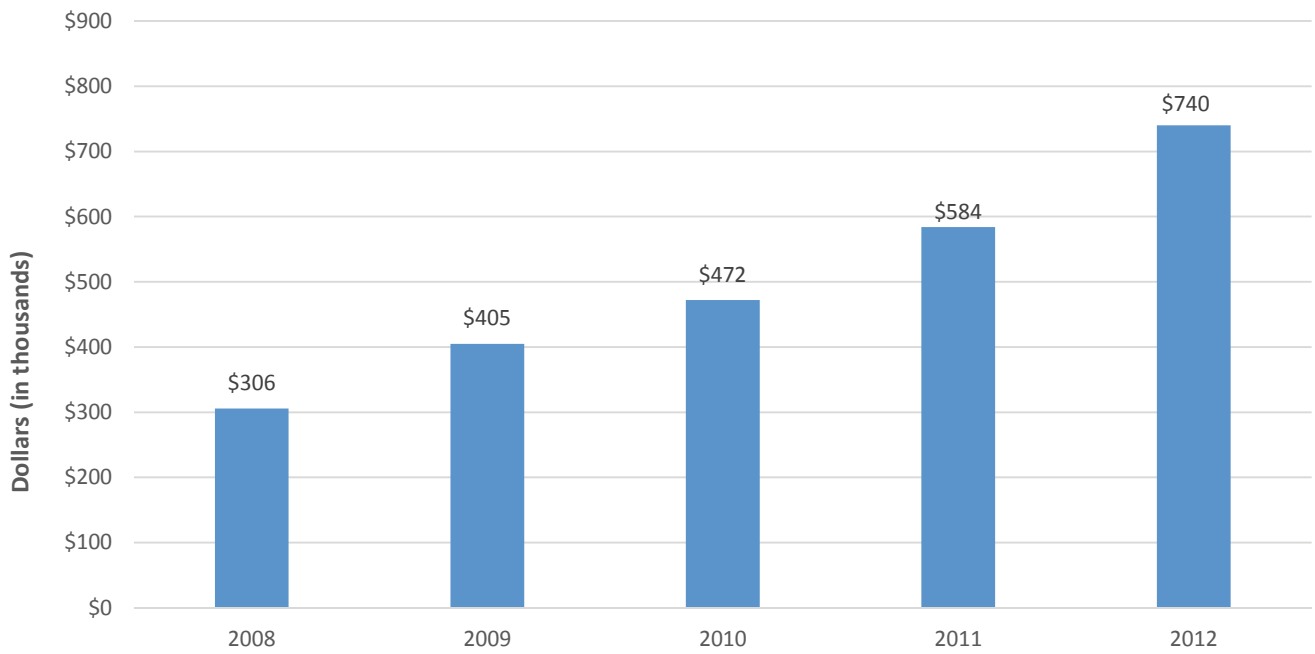
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Medicaid Recipient Opiate Overdose Emergency Department Visits by Intent, 2008-2012



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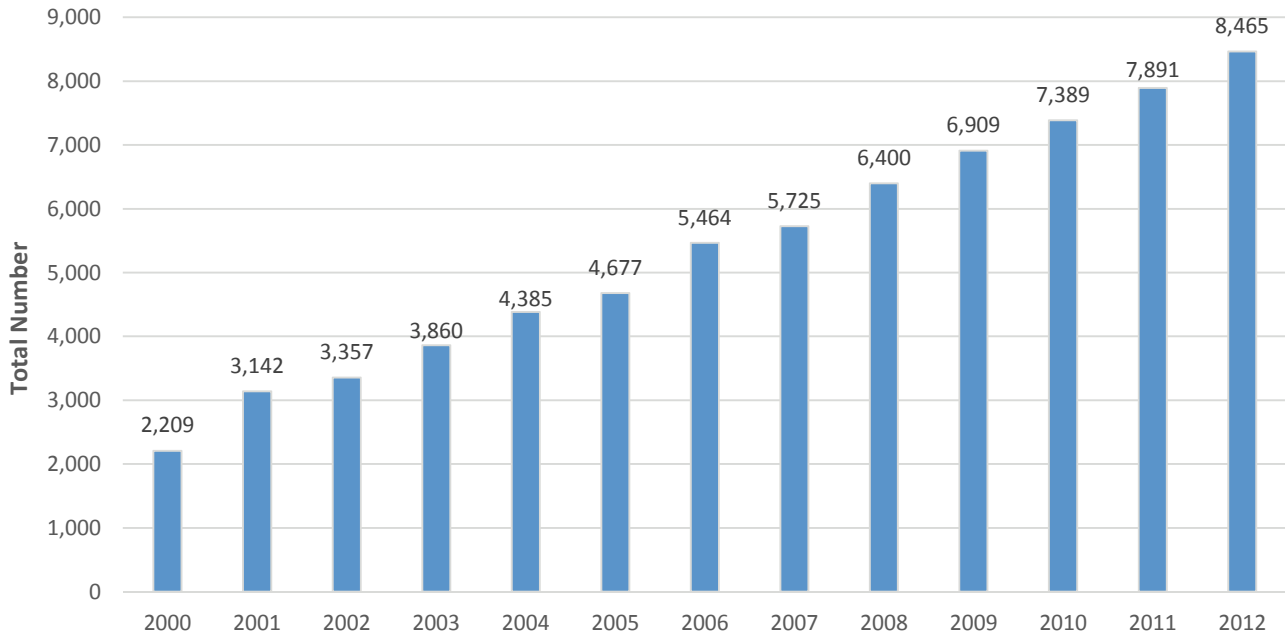
Medicaid Recipient Opiate Overdose Total Emergency Department Charges, 2008-2012



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**Opioid-Related
Disease Condition
Hospitalizations
2000-2012**

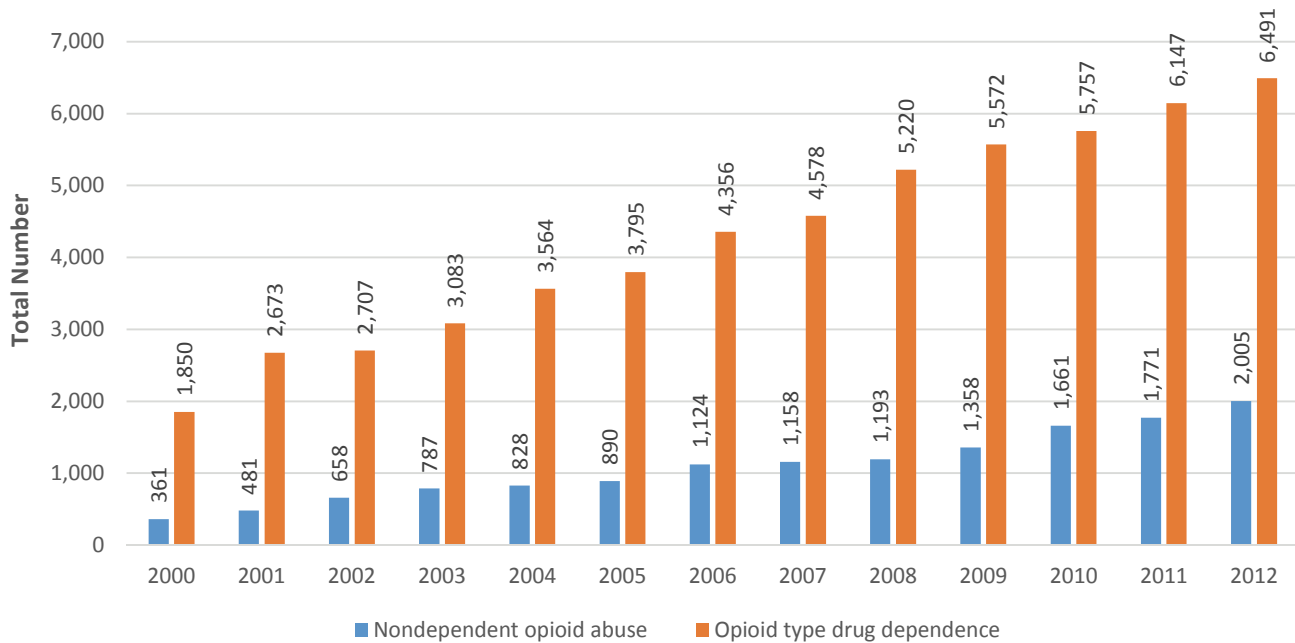
Kentucky Resident Opioid-Related Disease Condition Hospitalizations, 2000-2012



Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky inpatient hospitalization discharge data, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

Note: 6.7% of all opioid-related disease condition hospitalizations listed also an ICD-9-CM code for drug overdose

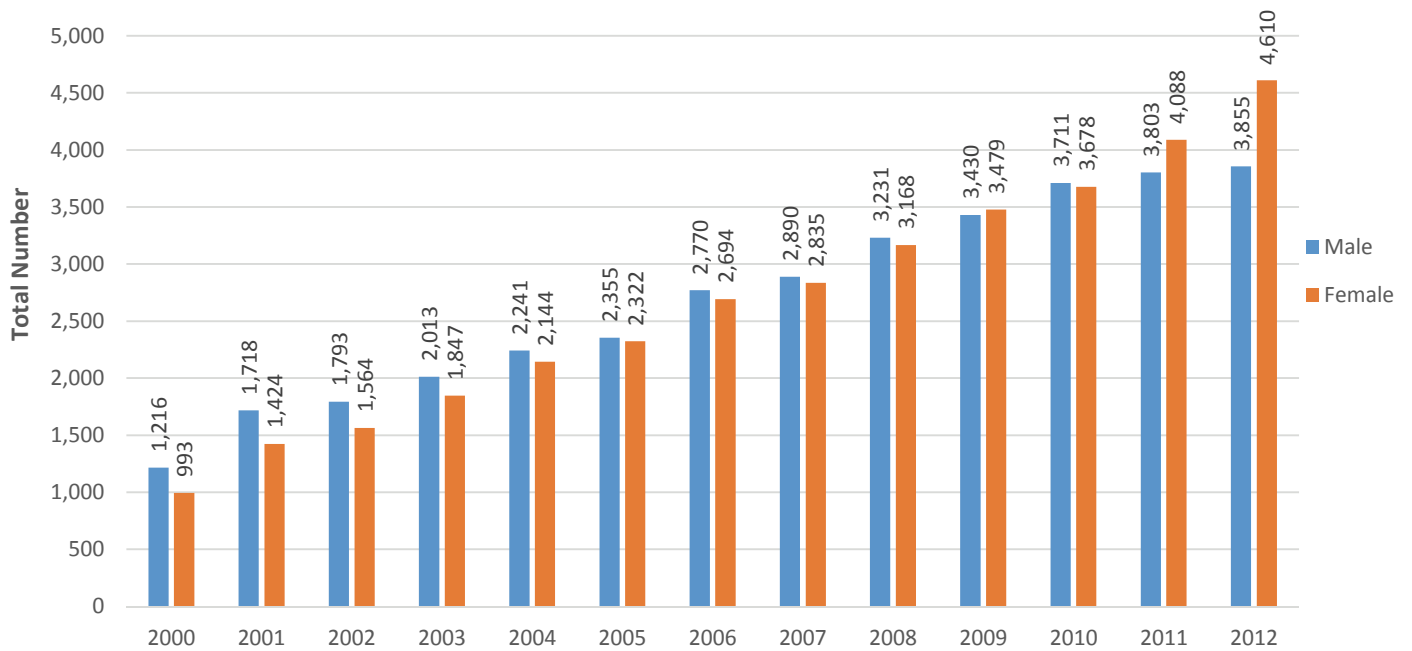
Kentucky Resident Opioid-Related Disease Condition Hospitalizations by Condition Type, 2000-2012



Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky inpatient hospitalization discharge data, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

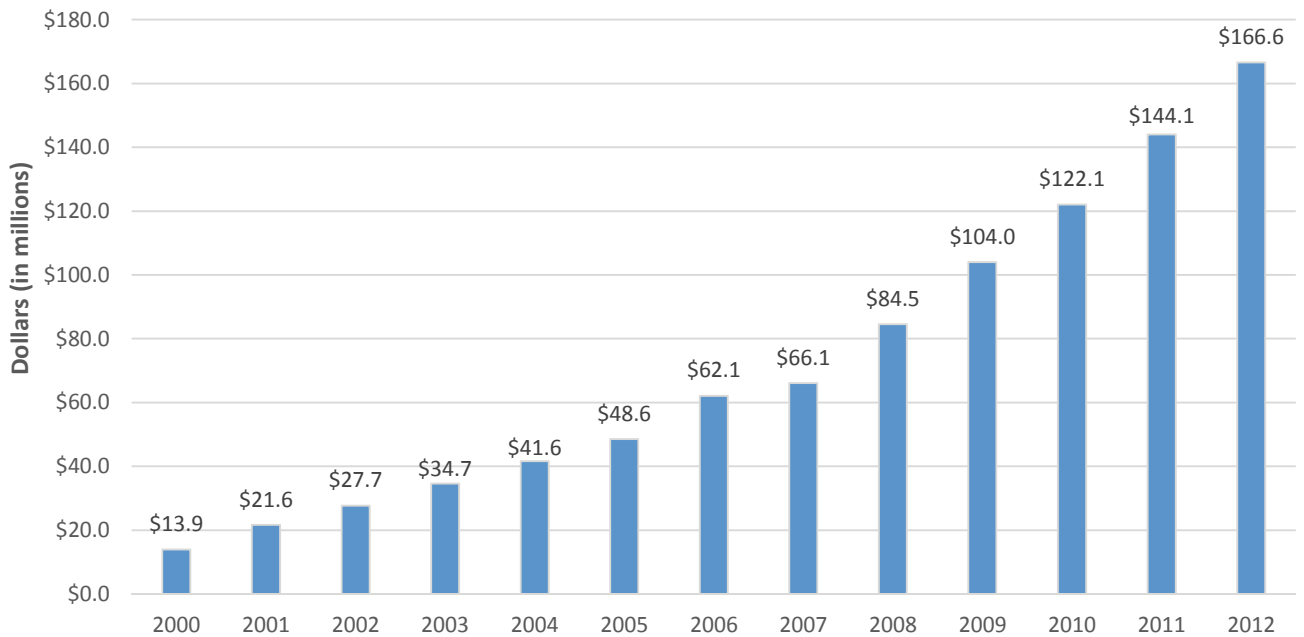
Note: 0.3% of all opioid-related disease condition hospitalizations listed both condition types

Kentucky Resident Opioid-Related Disease Condition Hospitalizations by Gender, 2000-2012



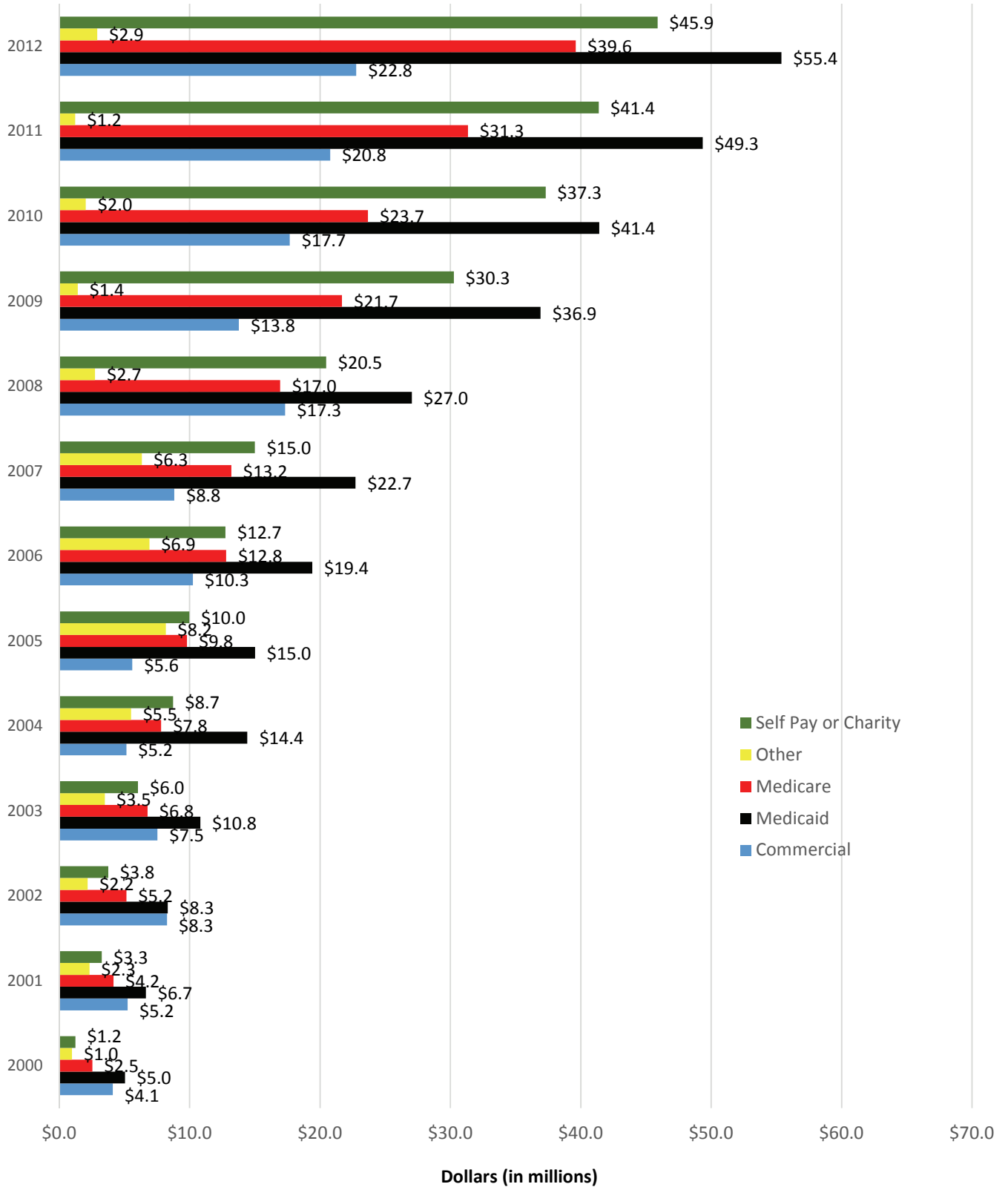
Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky inpatient hospitalization discharge data, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

Kentucky Resident Opioid-Related Disease Condition Hospitalization Charges, 2000-2012



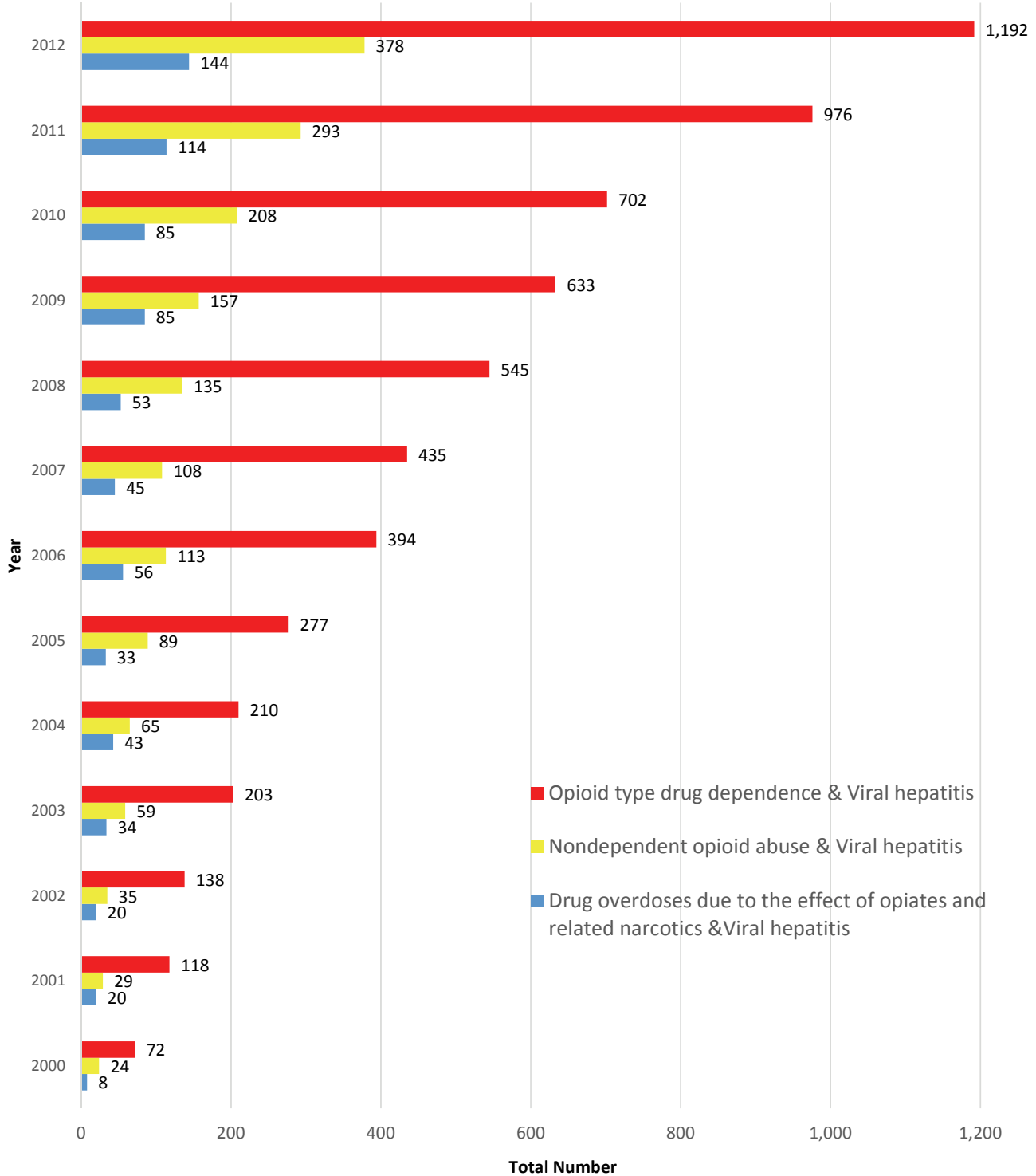
Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky inpatient hospitalization discharge data, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

Kentucky Resident Opioid-Related Disease Condition Hospitalization Charges by Expected Payer, 2000-2012



Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky inpatient hospitalization discharge data, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

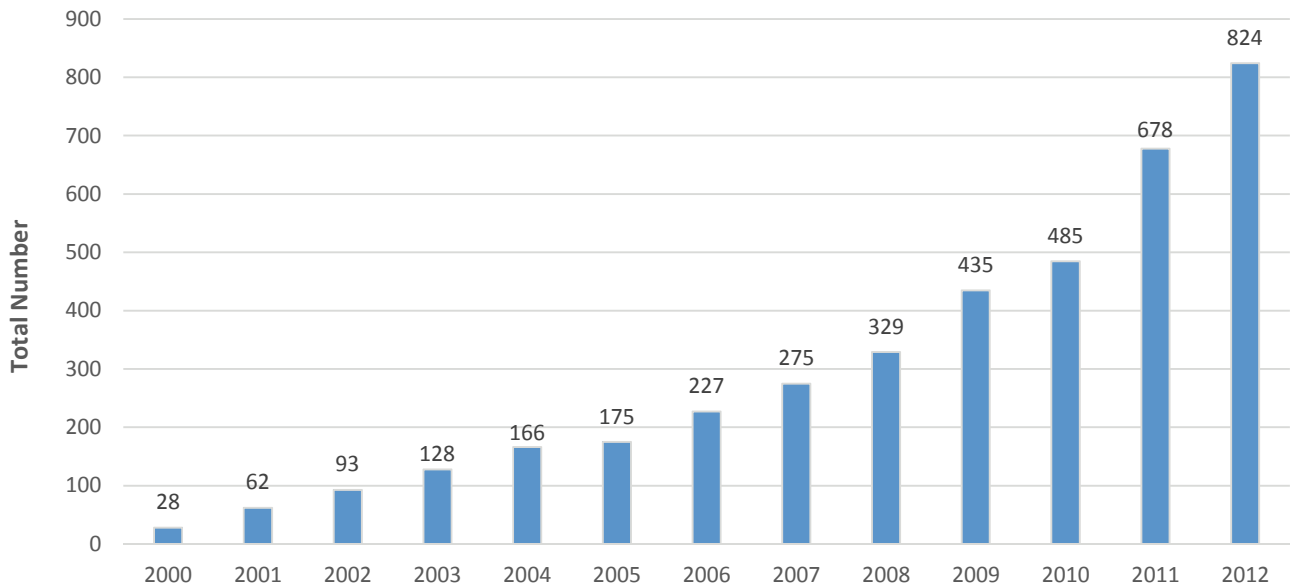
Kentucky Resident Hospitalizations Involving Opioid Drug Overdose or an Opioid-Related Disease Condition AND Viral Hepatitis, 2000-2012



Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky Outpatient Services Database, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

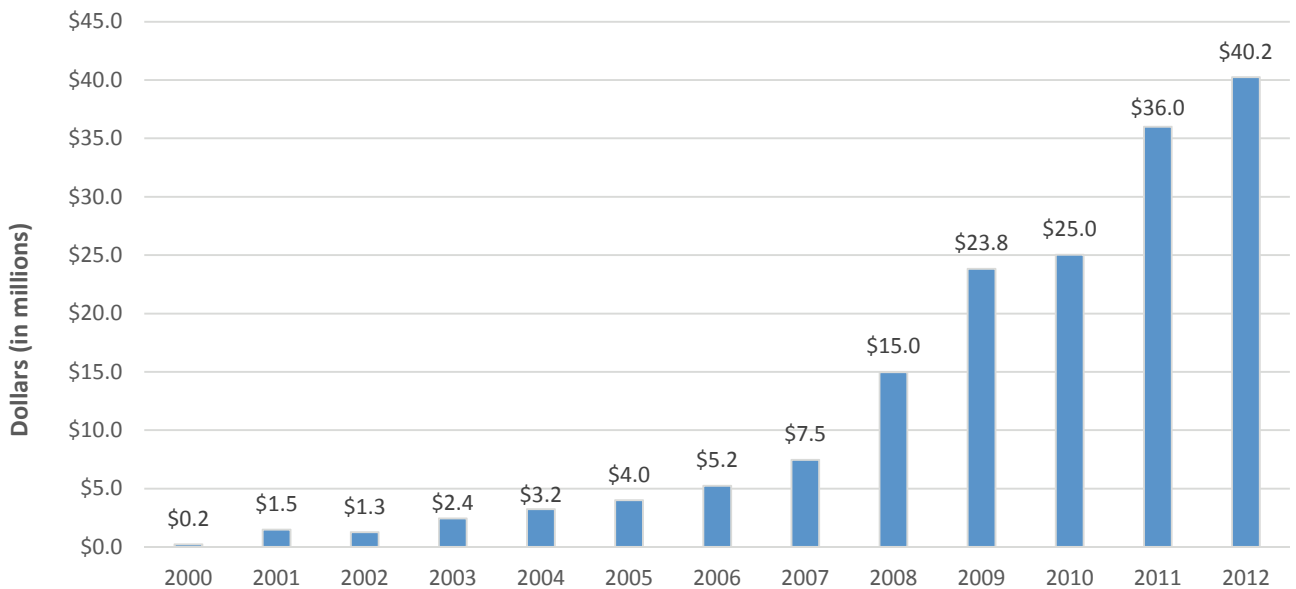
**Neonatal Abstinence
Syndrome
Hospitalizations
2000-2012**

Kentucky Resident Neonatal Abstinence Syndrome Hospitalizations, 2000-2012



Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky inpatient hospitalization discharge data, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

Kentucky Resident Neonatal Abstinence Syndrome Hospitalization Charges, 2000-2012



Produced by the Kentucky Injury Prevention and Research Center, January 2014. Data source: Kentucky inpatient hospitalization discharge data, Office of Health Policy. Data for 2010-2012 are provisional and subject to change.

Kentucky Resident Neonatal Abstinence Syndrome Hospitalizations by Expected Payer, 2000-2012					
		Commercial	Medicaid	Self-Pay or Charity	Other
Year	2000	5	20	<5	<5
	2001	16	41	<5	<5
	2002	11	67	8	7
	2003	21	99	<5	<5
	2004	14	139	<5	9
	2005	12	147	7	9
	2006	11	202	9	5
	2007	23	224	16	12
	2008	37	270	18	<5
	2009	38	355	40	<5
	2010	42	402	35	6
	2011	90	526	55	7
	2012	59	694	54	17

Note: Counts less than 5 were suppressed by state data management policy.

Kentucky Resident Neonatal Abstinence Syndrome Hospitalization Charges by Expected Payer, 2000-2012						
		Commercial	Medicaid	Self-Pay or Charity	Other	Total
Year	2000	\$75,463	\$155,642	\$4,318	\$1,074	\$235,423
	2001	\$989,491	\$464,827	\$11,180	\$20,927	\$1,465,498
	2002	\$181,443	\$932,251	\$24,374	\$113,947	\$1,138,068
	2003	\$685,212	\$1,597,333	\$9,166	\$145,842	\$2,291,710
	2004	\$262,538	\$2,731,983	\$50,125	\$189,625	\$3,044,646
	2005	\$471,640	\$3,201,153	\$46,089	\$276,770	\$3,718,883
	2006	\$161,693	\$4,802,755	\$138,686	\$134,258	\$5,103,135
	2007	\$697,463	\$6,001,220	\$414,598	\$355,295	\$7,113,281
	2008	\$2,700,471	\$11,503,166	\$685,389	\$96,154	\$14,889,026
	2009	\$3,142,217	\$19,266,407	\$1,198,435	\$227,639	\$23,607,058
	2010	\$2,156,244	\$21,052,317	\$1,231,209	\$580,403	\$24,439,769
	2011	\$6,360,864	\$28,130,564	\$1,267,251	\$232,167	\$35,758,679
	2012	\$3,287,661	\$34,876,300	\$1,606,756	\$476,472	\$39,770,716

APPENDIX A

ICD-9-CM codes for acute poisonings due to the effects of drugs (drug overdoses)

Type of Poison	ICD-9-CM codes
DRUG	E850-E585, E950(.0-.5), E962.0, E980(.0-.5), 960-979
-Nonopioid analgesics, Antipyretics, and Antirheumatics	E850(.3-.8), 965(.1-.8)
--4-Aminophenol derivatives	E850.4, 965.4
-Opiates/opioids	E850(.0-.2), 965.0
--Heroin	E850.0, 965.01
--Pharmaceutical Opioids	E850(.1-.2), 965(.00,.02-.09)
---Methadone	E850.1,965.02
-Cocaine	E854.3, E855.2, 968.5, 970.81
-Antidepressants, barbiturates and other antiepileptics, sedative-hypnotics, and psychotropic drugs not elsewhere classified	E851-E853, E854(.0-.2,.8), E855.0, E950(.1-.3), E980(.1-.3), 966, 967, 969, 970(.0,.1,.89)
--Benzodiazepines	E853.2, 969.4
--Psychostimulants with abuse potential including methamphetamine, MDMA (Ecstasy)	E854.2, 969.7
-Anticoagulants	964.2
-Other specified and unspecified drugs	E850(.9), E855(.1,.3-.9), E856-E858, E950(.0,.4,.5), E962.0, E980(.0,.4,.5), 960-963, 964(.0,.1,.3-.9), 965.9, 968(.0-.4,.6-.9), 970(.9),971-979,

For more information, please refer to:

[Consensus Recommendations for National and State Poisoning Surveillance, Safe States, April 2012.](#)

Conclusions

The combination of multiple prevention approaches such as mandatory enrollment and use of the Kentucky All Schedule Prescription Electronic Reporting system by prescribers and dispensers, physician ownership of pain clinics, prescriber guidelines for pain treatment, and increased law enforcement resulted in substantial decreases in Kentucky resident prescription drug overdose deaths, inpatient hospitalizations, and ED admissions from 2011 to 2012.

With that said, pharmaceutical opioids remained the primary drugs involved in drug overdose deaths; benzodiazepines were the primary drugs involved in drug overdose-related inpatient hospitalizations and ED visits. Pharmaceutical opioid involvement decreased 12% for drug overdose deaths, 8% for inpatient hospitalizations, and 6% for ED visits from 2011-2012. Correspondingly, benzodiazepine involvement decreased 16% for drug overdose deaths, 11% for inpatient hospitalizations, and 9% for ED visits from 2011-2012. Raising awareness of the dangers of mixing benzodiazepines with opioids should be an emphasis of physician continuing education for relaying to opioid patients during medical consultations.

While the contribution of prescription opioids and benzodiazepines to drug overdoses decreased from 2011 to 2012, there was a precipitous increase in heroin involvement in drug overdose deaths, inpatient hospitalizations, and ED visits over the same time period. Heroin involvement increased 207% for drug overdose deaths, 174% for inpatient hospitalizations, and 197% for ED visits. Opioid-related hospitalizations and ED visits are costly in more than only financial terms. Disease conditions already present or those caused by opiate addiction such as viral hepatitis also exert an enormous societal as well as financial toll on the commonwealth's population. Increased law enforcement, adjudication, legislation, and heroin abuse treatment should be a major priority for Kentucky to reduce heroin-related deaths, and hospitalizations.

Total inpatient hospitalization charges for drug overdoses rose 7% in 2012 to \$129.3 million. Likewise, drug overdose ED charges rose 5% to \$15.3 million in 2012. The primary expected payers for drug overdose related inpatient hospitalizations were Medicare (\$41.3 million) and Medicaid (\$34.1 million). Self-pays were the largest expected payer for drug overdose ED visits (\$5 million) followed by Medicaid (\$4.2 million).

Medicaid recipient opiate overdose ED charges increased 27% in 2012 to \$740,000. Inpatient hospitalizations of Medicaid recipients for opiate overdoses leveled off in 2012 at \$11 million. Elevated Medicaid charges illustrate the need for naloxone (an opiate antidote) reimbursement by Medicaid so that Medicaid recipients are not charged for its purchase. Intranasal administration of naloxone during an opiate overdose has been credited with saving countless lives.

A multipronged strategy to reduce substance abuse in the Commonwealth of Kentucky involves the basic elements of the public health model that includes comprehensive surveillance and tracking of drug overdoses, identification of the risk factors that result in drug overdoses, development of interventions to prevent drug overdoses, and the widespread adoption of substance abuse prevention interventions. In addition, increased continuing education of physicians on drug abuse and treatment, increased law enforcement, increased adjudication, and increased substance abuse treatment facilities are necessary to decrease the extraordinary toll of substance abuse on Kentucky citizens who are addicted.

About This Report

This report presents drug overdose morbidity and mortality data for Kentucky residents, using multiple data sources:

- Kentucky Death Certificate Files, Kentucky Office of Vital Statistics, 2000-2012 (data captured as of October 21, 2013). The 2009-2012 files are provisional and subject to change.
- Kentucky Inpatient Hospitalization (IH) Discharge Files, Cabinet for Health and Family Services, Office of Health Policy, 2000-2012 (data for 2010-2012 are provisional and subject to change).
- Kentucky Emergency Department (ED) Discharge Files, Cabinet for Health and Family Services, Office of Health Policy, 2008-2012 (data for 2010-2012 are provisional and subject to change).

Drug overdose mortality and morbidity case selection was based on operational definitions of **acute drug poisoning** (also called “**drug overdose**”) by the Injury Surveillance Workgroup on Poisoning (ISW7) in their *Consensus Recommendations for National and State Poisoning Surveillance, The Safe States Alliance, Atlanta, GA, April 2012.*¹

Drug Overdose Deaths:

Each death certificate contains one underlying cause of death and multiple contributing causes of death. The underlying cause of death is defined as the reason that initiated the chain of events leading directly to death. The underlying and contributing causes of death are coded according to the International Classification of Diseases, 10th revision (ICD-10) [www.who.int/classifications/icd10/].

Definition: Drug overdose deaths were identified as deaths with an underlying cause of death in the following 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).

The types of drugs contributing to drug overdose deaths were identified using ICD-10 codes T36-T50.9 listed in any of the multiple causes of death fields. Contributing drugs were reported in standardized categories, following the ISW7 Poisoning Matrix for ICD-10 Coded Mortality Data.¹

Drug Overdose Hospitalizations and ED Visits :

IH and ED data were coded according to the International Classification of Disease, 9th revision, Clinical Modification (ICD-9-CM, www.icd9cm.chrisendres.com). The ICD-9-CM system describes an injury using diagnosis codes and E-codes. The Kentucky IH and ED data systems include up to 25 diagnosis code fields per case. The first diagnosis code is called the principal diagnosis code. The principal diagnosis for a hospitalized patient is the main reason for the patient’s hospital stay and is based on the clinical findings during the patient’s stay. For ED data, the primary diagnosis code is the diagnosis established to be the main reason for the visit to the emergency department. Other conditions/diagnoses that exist at the time of the IH/ED visit and affect the diagnosis, treatment, or length of stay in the health facility, are also coded in the remaining 24 diagnosis code fields in the IH/ED datasets and are called secondary diagnoses. Injury diagnoses should be supplemented (when circumstances of the injury are known) with additional codes called E-codes. E-codes are separated into three groups: external-cause-of-injury codes, place-of-injury codes, and activity codes.

The external-cause-of-injury code describes the external cause (in this case, poisoning) and the intent of injury. Based on the external-cause-of-injury code, a drug poisoning can be classified by intent as accidental (unintentional, E850-E858), intentional (self-harm, E950.0-E950.5; or assault, E962.0), or undetermined (E980.0-E980.5 when based on insufficient documentation in the medical chart to determine whether the drug overdose was accidental or intentional). Some injury records in the IH or ED datasets, however, are not supplemented with E-codes at all. We treat such records as a separate category and refer to them as “missing intent” or “no E-code”. IH and ED electronic records may contain up to three designated E-code fields. On average, more than 90 percent of the Kentucky HD and ED cases with poisoning diagnoses are supplemented with valid external-cause-of-injury codes.

Definition: A hospitalization or emergency department visit was considered a drug overdose if

- 1) any of the ICD-9-CM codes in the range 960-979 were listed in any diagnosis (principal or secondary) fields; or
- 2) any of the ICD-9-CM codes in the range E850-E858, E950.0-E950.5, E962.0, or E980.0-E980.5 were listed in the E-code fields.

This Injury Surveillance Workgroup on Poisoning¹ definition is a broader definition than the definition used in the 2012 report² on drug overdose morbidity and mortality in Kentucky. Therefore, if comparing the morbidity sections in the current and in the 2012 report, one will notice about a 30% increase in the reported cases of drug overdose hospitalizations or ED visits. The 2012 report was based on definitions derived from the external-cause-of-injury matrix and didn't capture encounters of care where the principal diagnosis was not a drug overdose but the secondary diagnosis was drug overdose. A study on drug overdose ED visits in the U.S. suggested that mild or moderate drug overdoses were likely to have the drug poisoning as their primary diagnosis but severe drug poisoning cases were likely to have a critical illness as the primary diagnosis.³ Severe drug overdoses can result in acute respiratory, heart, or renal failure that may be listed as principal diagnoses with a drug overdose listed as the secondary diagnosis. As the state enacts policies and plans for adequate substance abuse treatment resources, the most comprehensive definition to track and enumerate total drug overdose hospitalizations and ED visits was used to provide a more accurate picture of the magnitude of substance abuse and misuse, the specific drugs involved, and the specific populations at higher risk for drug overdoses.

Only records for KY residents treated in Kentucky acute care hospitals or Kentucky emergency departments are included in this report. Data for Kentucky residents treated in neighboring states were not available and not included in this report. Therefore, the presented counts and rates likely underestimate the full extent of drug overdoses in Kentucky. Reported frequencies reflect the number of visits/hospitalizations since follow-up visits and readmissions for one and the same drug overdose could not be identified.

Age-adjusted morbidity and mortality rates were based on 2000 U.S. standard population data. For each of the three data sets, the number of cases classified as assault was low (48 ED visits from 2008 – 2012, 35 hospitalizations from 2000 – 2012 and seven fatalities from 2000 – 2012) and were not included in the figures or discussed in this report.

A section on mental disorder hospitalizations involving opiates/opioids was included in the report in order to describe disease conditions induced by opium, heroin, and/or opioid analgesics. The case selection followed the ISW7¹ framework and included hospitalizations related to opioid type dependence, drug dependence on combinations of opioid type drugs with any other, or nondependent opioid abuse, identified by any of the following ICD-9-CM codes in any of the diagnosis fields: 304 (.00-.02, .70-.72), 305 (.50-.52).

In the hospital discharge dataset, drug overdoses due to the effect of opiates and related narcotics were identified as records with any of the ICD-9-CM code 965(.00-.09) in any of the diagnosis fields.

Viral hepatitis cases we identified by ICD-9-CM code 070 in any of the diagnosis fields.

Neonatal Abstinence Syndrome (NAS) is a drug withdrawal syndrome in a newborn that is caused by the mother's drug abuse during pregnancy. Hospitalizations involving drug withdrawal syndrome in a newborn are identified by the ICD-9-CM code 779.5 listed in any of the diagnosis fields. A section on NAS hospitalizations was added to this report to describe another aspect and burden of drug abuse and addiction in the Commonwealth.

References:

1. Consensus Recommendations for National and State Poisoning Surveillance, The Safe States Alliance, Atlanta, GA, April 2012.
2. Bunn TL, Slavova S, Drug Overdose Morbidity and Mortality in Kentucky, 2000-2010, KIPRC, 2012.
3. Xiang Y, Zhao W, Xiang H, Smith GA. ED Visits for Drug-related Poisoning in the United States, 2007. Am J Emerg Med. 2012 Feb; 30(2):293-301.