

# Enhanced State Surveillance of Opioid Involved Morbidity and Mortality (CE16-1608)

*Opioid Surveillance in Missouri-  
A New Chapter*



**Public Health**  
Prevent. Promote. Protect.



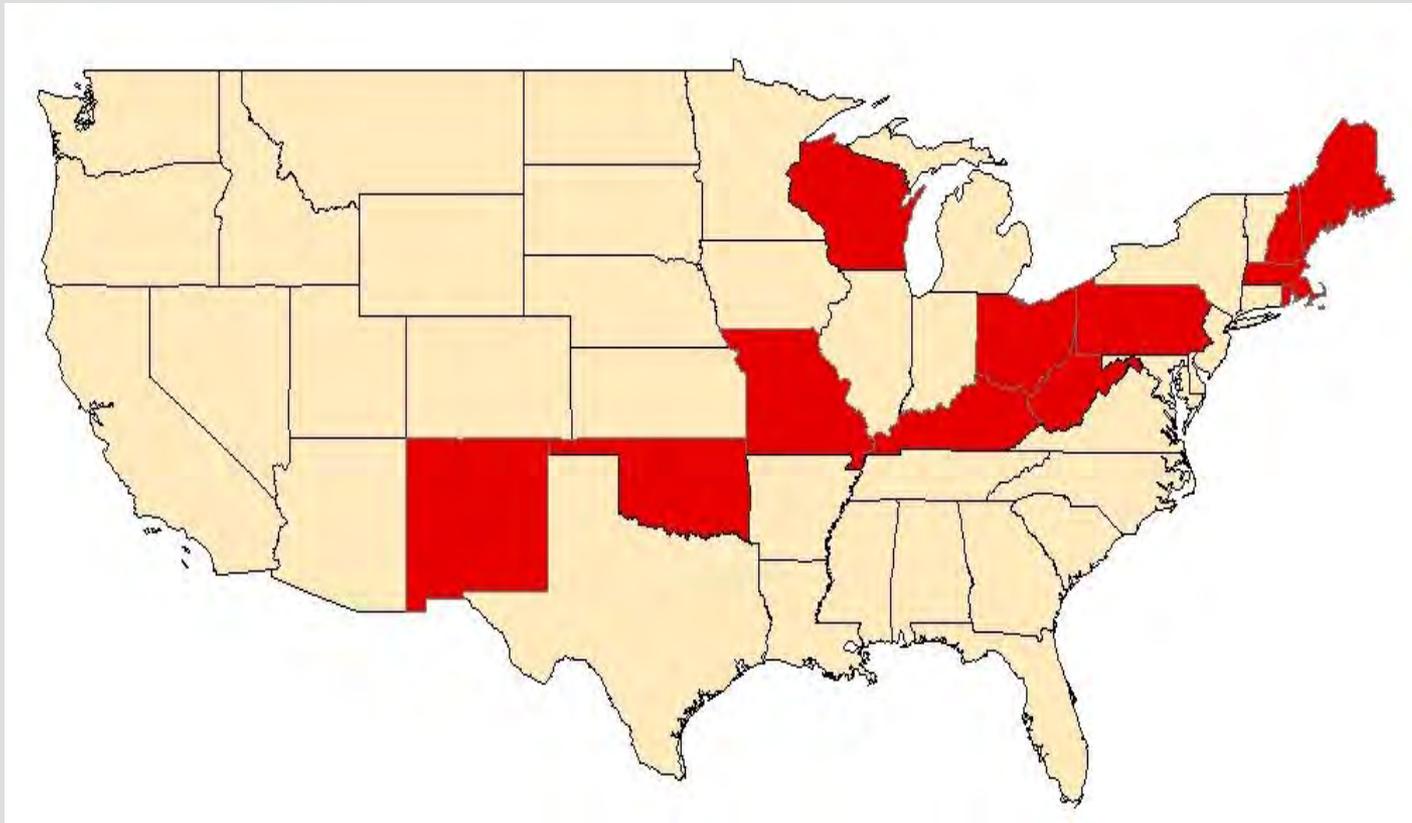
Bureau of Health Care Analysis and Data Dissemination  
Bureau of Reportable Disease Informatics

# Opioid Grant Overview

- This 3-year grant supports states with a high burden of drug overdoses to quickly improve the timeliness of fatal and nonfatal opioid overdose surveillance, including overdoses related to opioid pain relievers and heroin. (CDC, 2016)
  - Strategy 1- Increase the timeliness of aggregate nonfatal opioid overdose reporting.
  - Strategy 2- Increase the timeliness of fatal opioid overdose and associated risk factor reporting.
  - Strategy 3- Disseminate surveillance findings to key stakeholders working to prevent or respond to opioid overdoses.

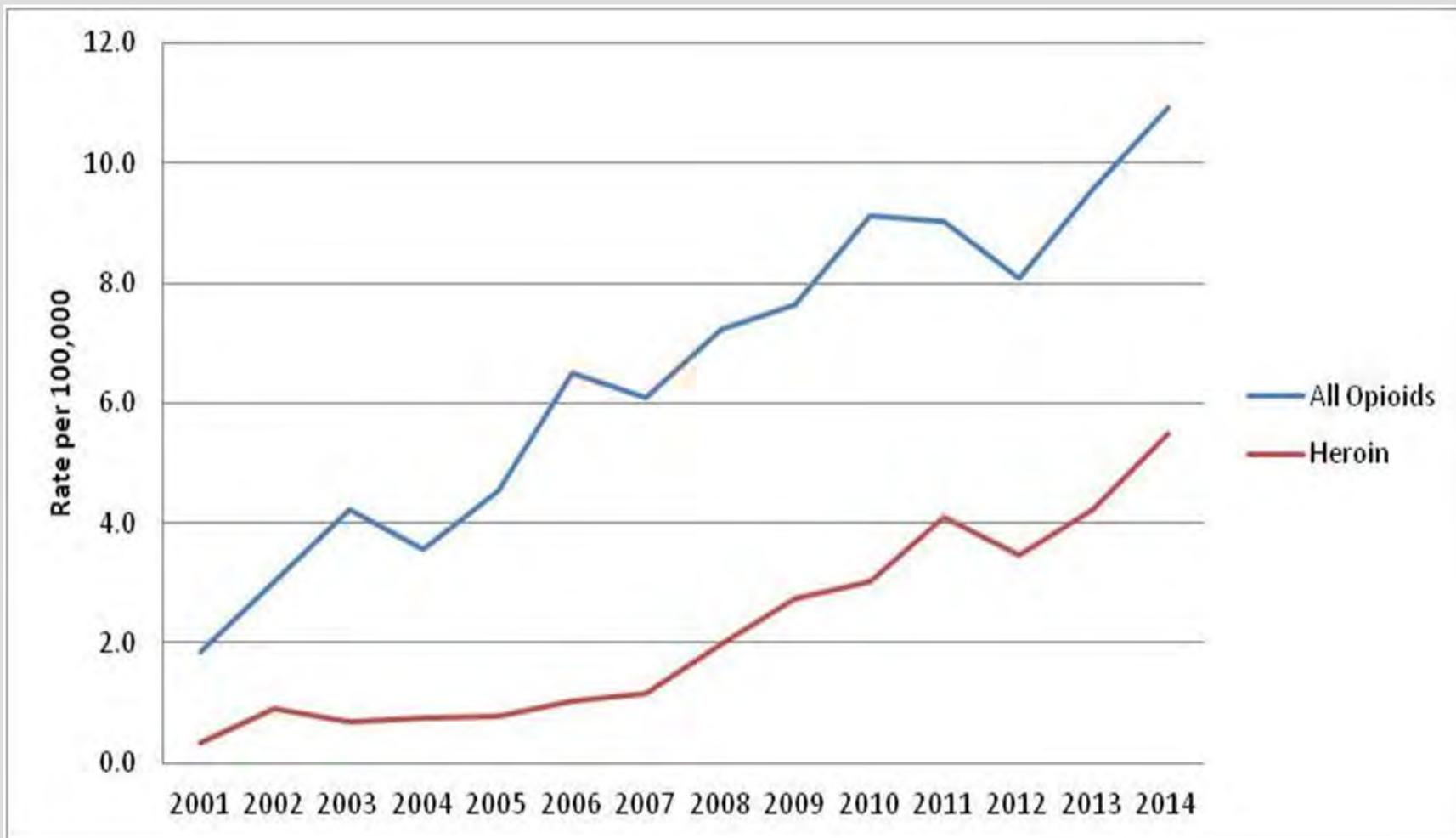


# States Awarded CDC Enhanced Opioid Surveillance Grant



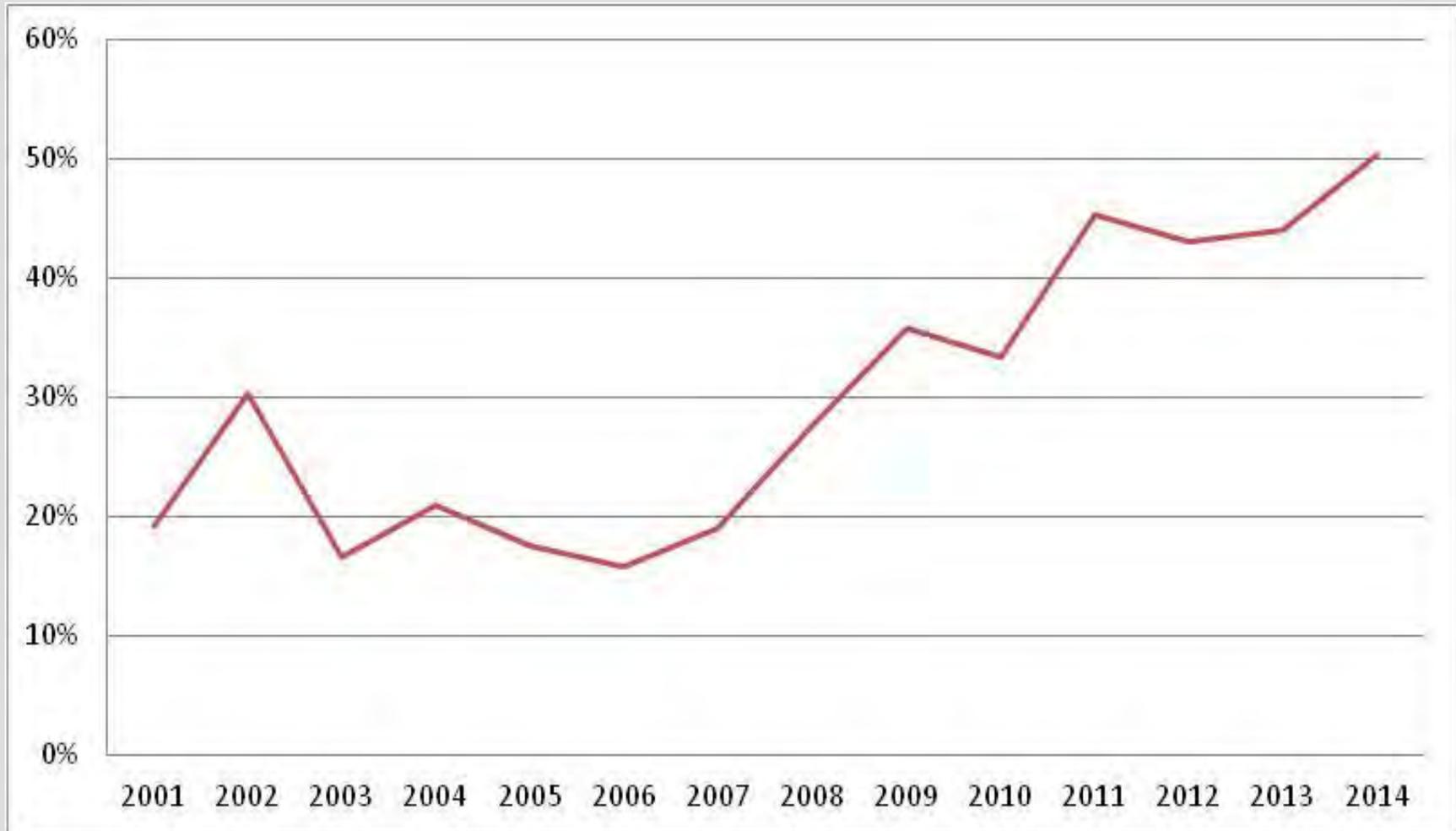
Source: Bureau of Health Care Analysis and Data Dissemination, Missouri Department of Health and Senior Services

## Missouri Opioid and Heroin Death Rates, 2001-2014



Source: Bureau of Vital Statistics, Missouri Department of Health and Senior Services

## Missouri Heroin Deaths as a Percent of All Opioid Deaths



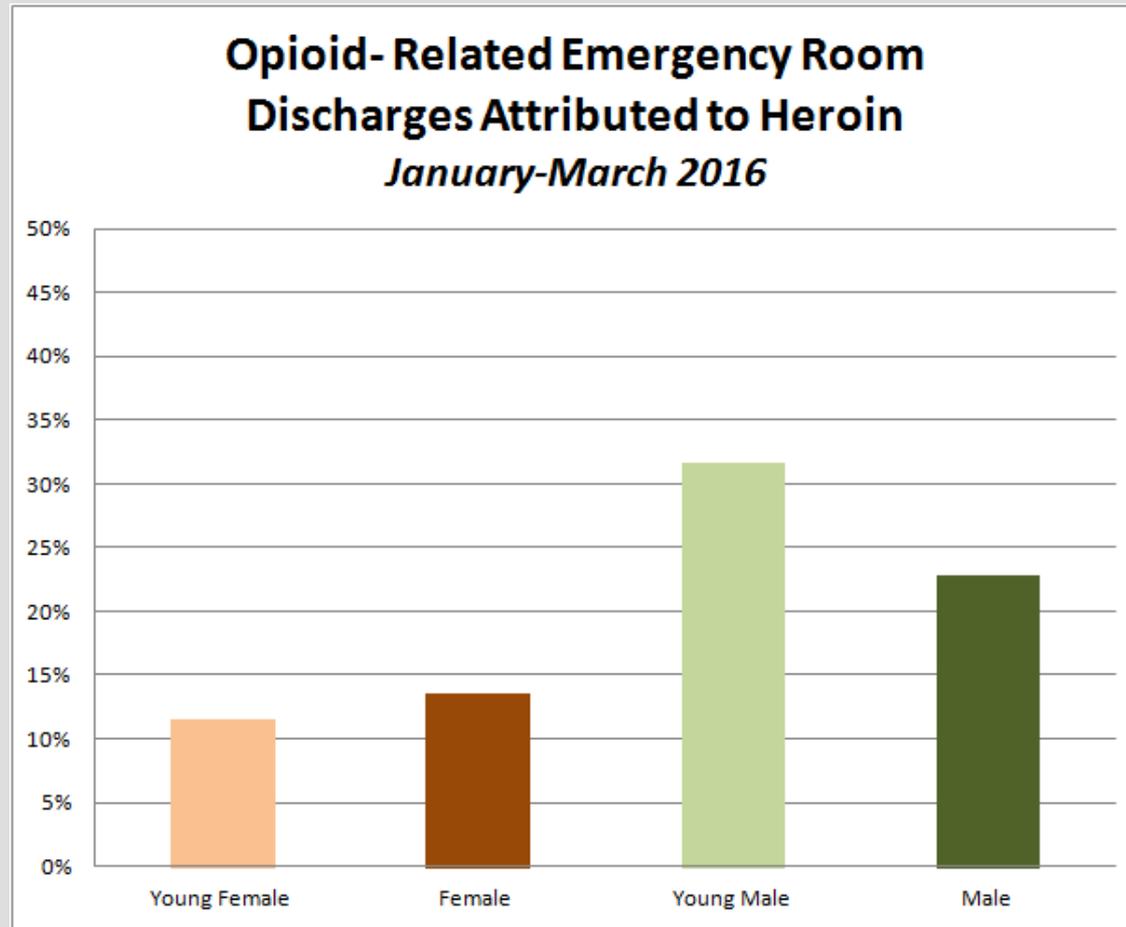
Source: Bureau of Vital Statistics, Missouri Department of Health and Senior Services

# Demographics

Geography	Population	Male	Female	Minority	Overdose ER Visits, 2014	UUDO, 2014
United States	314,107,072	49.2%	50.8%	37.2%	n/a	41,541
Missouri	6,028,076	49.0%	51.0%	19.5%	55,077	949
<b>Missouri Youth*</b>	<b>1,470,958</b>	<b>51.2%</b>	<b>48.8%</b>	<b>24.6%</b>	<b>3,238</b>	<b>15</b>
* Missouri Youth includes all residents aged 18 and under.						
Source: American Community Survey, 2010-2014 American Community Survey 5- Year Estimates						

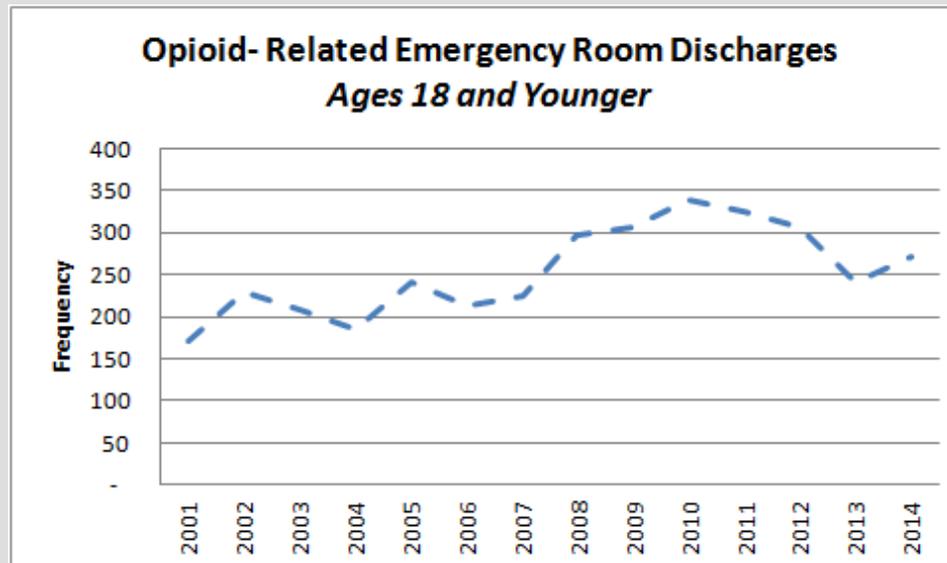
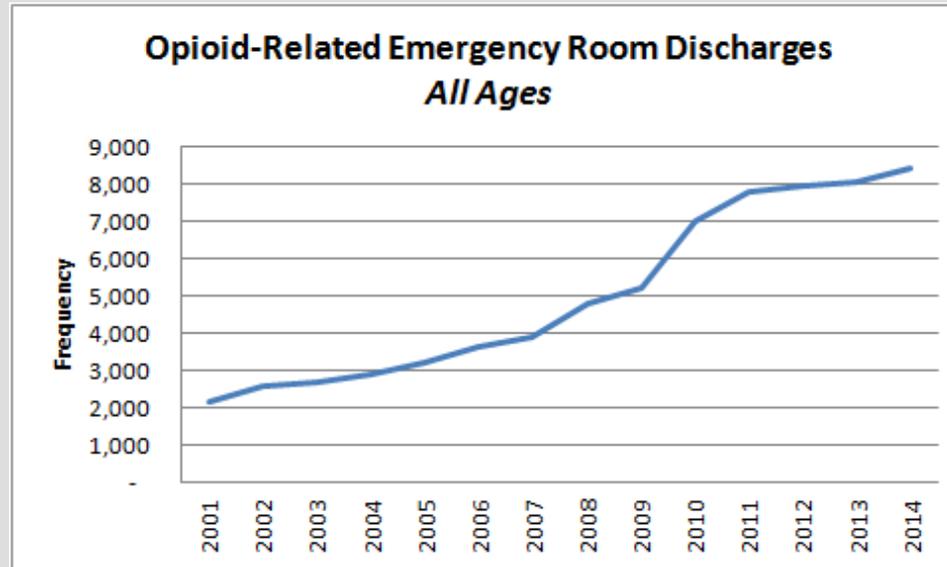
- Missouri Youth (ages 18 and younger) make up roughly 24% of the state population.
- This population is slightly more male and more diverse than the at-large Missouri population.
- Youth represent less than 6% of drug overdose ER visits and less than 2% of total unintentional and undetermined drug overdose deaths in 2014.

# Recent Emergency Room Trends

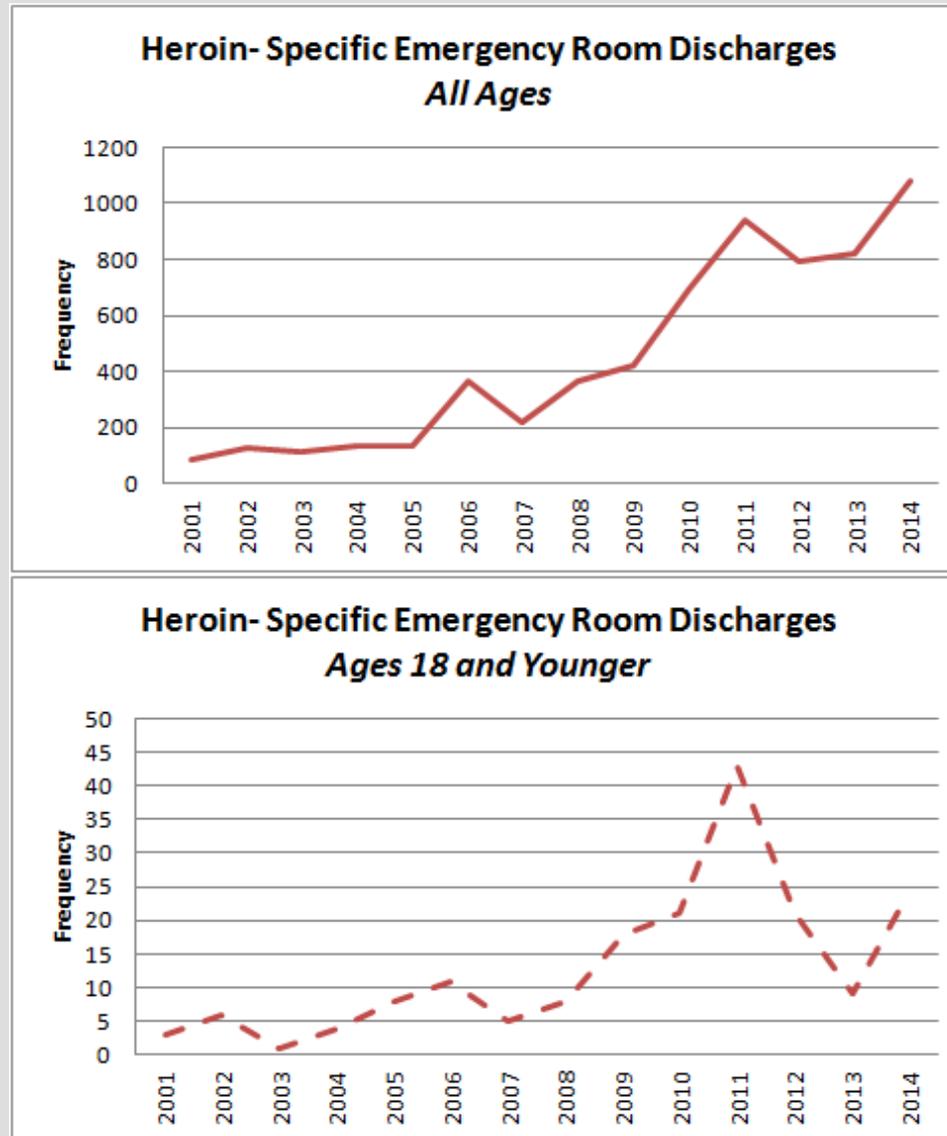


Source: Bureau of Health Care Analysis and Data Dissemination, Missouri Department of Health and Senior Services

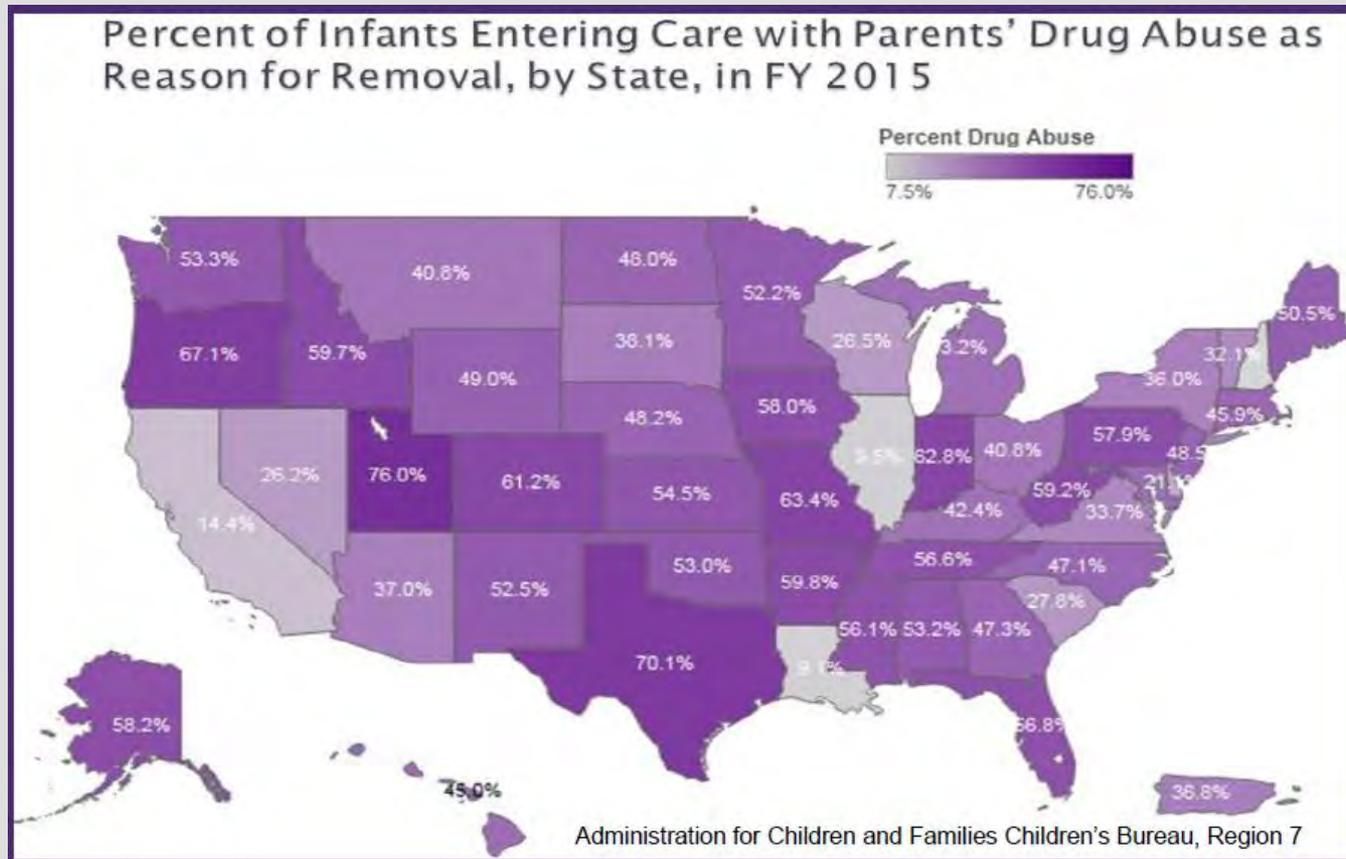
# Opioid Trends



# Heroin Trends



# Impacting Missouri's Youth



# Strategy 1- Nonfatal Opioid Overdose Reporting

- Increase the timeliness of aggregate nonfatal opioid overdose reporting.
- Target area is the entire state of Missouri.
- Focus will be on emergency department records.

# Strategy 1- Nonfatal Opioid Overdose Reporting

- Two Data Sources
  - ESSENCE (Electronic Surveillance System for the Early Notification of Community-based Epidemics)
  - Missouri Patient Abstract System (PAS) quarterly Emergency Room discharge files
- Three types of data collected
  - Any drug overdose
  - Any opioid overdose
  - Any heroin overdose

## What is ESSENCE?

- ❑ Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE)
- ❑ Web-based automated surveillance tool
- ❑ Emergency Department chief complaints
- ❑ Installed in 2006
- ❑ Data loaded hourly; available 24/7/365
- ❑ 9,000 ED visits per day

## Where do ESSENCE data come from?

- ❑ 98 Missouri hospitals
  - 93% of all ED visits statewide (estimated)
  
- ❑ 12 Illinois facilities
  - 8 hospitals
  - 4 urgent care centers
  
- ❑ 5 Kansas hospitals



# What data does ESSENCE have?

- ❑ Patient Demographics
  - Admission Date and Time
  - Hospital Name
  - Zip Code (patient)
  - Region (patient)
  - Age Group
  - Age
  - Sex
  - Race
  - Ethnicity
- ❑ Chief Complaint
- ❑ Category (Rash, GI, Neuro, Fever, etc.)
- ❑ Medical Record Number

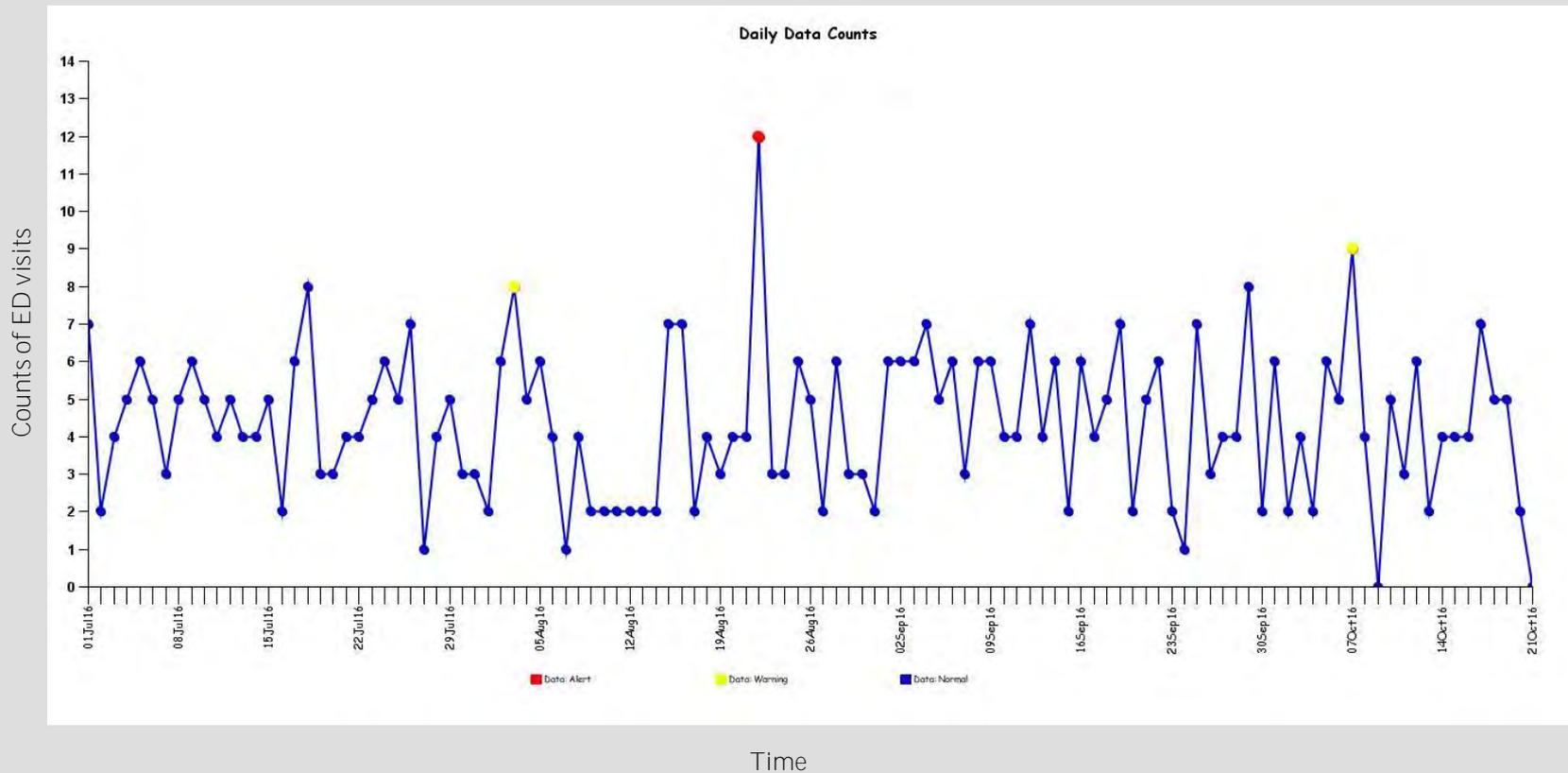
## How is ESSENCE used in opioid surveillance?

### ❑ ESSENCE queries for opioid surveillance

- Overdose: ^overdose^,or,^over dose^,or,^ od  
^,or,^detox^,or,^withdraw^,or,^poisoing^,or,^drug  
abuse^,or,^substance  
abuse^,or,^opioid^,or,^opiod^,or,^opiate^,or,^opium^,or  
, ^narcotic^,or,^methadone^ ,or,^heroin^
- Opioid: ^opioid^,or,^opiod^,or,^opiate^,or,^opium^,or,  
^methadone^,or,^narcotic^,or,^heroin^
- Heroin: ^heroin^

# How is ESSENCE used in opioid surveillance?

## Daily ED visits due to opioid abuse in ESSENCE



# How is ESSENCE used in opioid surveillance?

Patient Number	Chief Complaint
1	UNDERDOSING OF UNSPECIFIED <b>NARCOTICS</b> SEQUELA
2	HEADACHE AND ISSUES FROM INJECTING <b>HEROIN</b>
3	<b>NARCOTIC</b> OVERDOSE/ASPIRATION
4	DETOX <b>OPIATES</b> *4176215488
5	ABSCESS TO RIGHT AC <b>HEROIN</b> USE
6	<b>OPIATE</b> WITHDRAWL
7	POSS 6 WKS HCG <b>NARC</b> WITHDRAWL FATIGUE INSOMNIA
8	TOOK SOME NARCAN AFTER USING <b>OPIOIDS</b>
9	N/V ABD PAIN LEFT ARM PAIN AND EDEMA. HX OF <b>HEROIN</b> USE X 1 WEEK FROM URGENT CARE.
10	20YO MALE PRESENTING TO BHED FOR <b>OPIATE</b> DETOX AND SI. STATES LAST <b>OPIATE</b> USE WAS 2 DAYS AGO. STATES DEPRESSION FOR PAST WEEK DUE TO GETTING KICKED OUT OF MOTHERS HOME FIRED FROM JOB DUE TO DRUG USE
11	PT WAS FOUND IN PARKING LOT INTOXICATED. PT REPORTS HE DRANK A LOT OF ALCOHOL TODAY REPORTS LISTERINE IS HIS DRINK OF CHOICE. PT REQUESTING <b>HEROIN</b> ON ARRIVAL. PT REPORTS SI. BG 78 ON ARRIVAL.
12	PT ARRIVED VIA EMS. PT WAS SEEN AT LW TODAY FOR ETOH AND POSSIBLE <b>HEROINE</b> USE. RELEASED AND WENT HOME AND DRANK MORE. PT ALERT BUT NOT TALKING CURRENTLY.

# Patient Abstract System (PAS)

- DHSS receives inpatient, emergency room, and outpatient data from approximately 132 Missouri hospitals.
- This data includes a variety of demographic information, as well as variables about the visit itself.
- Each healthcare record has 23 diagnoses fields (containing ICD codes, not literals), though rarely are all of these used.
  - DX1= Chief Complaint

## PAS- continued

- Data is received quarterly and converted into an annual file.
- Missouri has entered into an agreement with Hospital Industry Data Institute (HIDI) to download data monthly in the early period of the grant in order to establish methodology.

Quarter	Months	HIDI File Due to DHSS	DHSS File/Report Due to CDC
1	Jan - Mar	June 1	July 15
2	Apr - June	September 1	October 15
3	July - Sept	December 1	January 15 (following year)
4	Oct - Dec	March 1 (following year)	April 15 (following year)

## PAS- continued

- Strategy 1 will use emergency room (and possibly some inpatient) data for all Missouri residents, statewide.
- While case definitions are currently evolving, DHSS has committed to look at three categories of diagnoses:
  - All Drug Overdoses
  - All Opioid Overdoses
  - All Heroin Overdoses

# PAS- continued

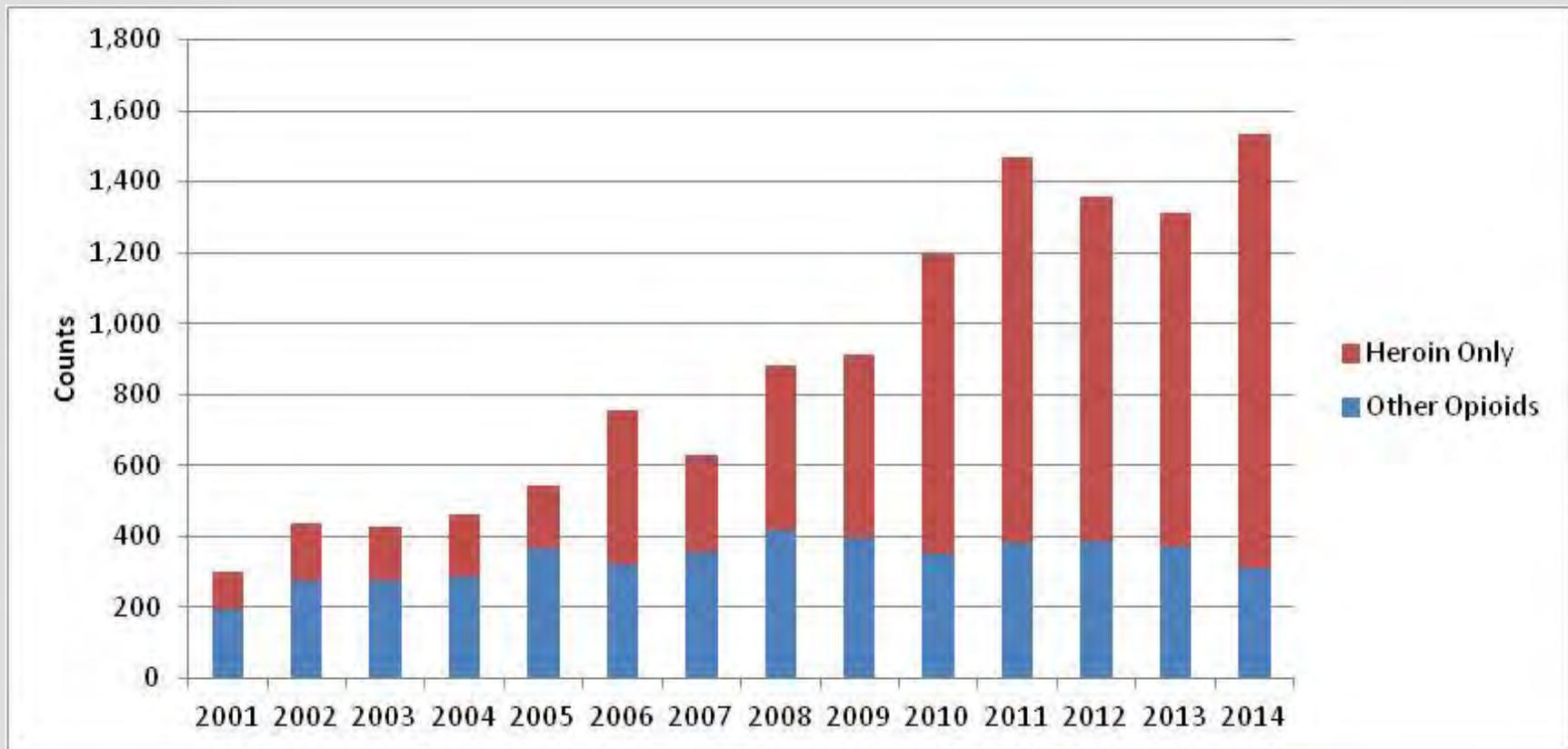
## Time and Space Trends in Opioid-Related ER Diagnoses

Missouri Resident Opioid-Related Emergency Room Discharges by Year and Location							
Year	Geography	Discharges	Population	Rate	95% Lower Confidence Limit	95% Upper Confidence Limit	Significantly Different*
2010	Missouri	6,999	5,988,927	1.169	1.142	1.196	L
2011	Missouri	7,778	6,010,544	1.294	1.266	1.323	L
2012	Missouri	7,960	6,025,281	1.321	1.292	1.350	L
2013	Missouri	8,064	6,044,917	1.334	1.305	1.363	N/S
<b>2014</b>	<b>Missouri</b>	<b>8,393</b>	<b>6,063,589</b>	<b>1.384</b>	<b>1.355</b>	<b>1.414</b>	
2014	Bates County	28	16,584	1.688	1.166	2.445	N/S
2014	Jackson County	538	683,191	0.776	0.713	0.845	L
* Comparison value for the significance column was the 2014 Missouri rate. Rates are per 1,000 residents.							
L= significantly lower, N/S= no significant difference, H= significantly higher							

Source: Bureau of Health Care Analysis and Data Dissemination, Missouri Department of Health and Senior Services

# PAS- continued

## Missouri Heroin versus Other Opioid Diagnoses- ER Setting



Source: Bureau of Health Care Analysis and Data Dissemination, Missouri Department of Health and Senior Services

# Linking ESSENCE and PAS

- DHSS will attempt matching on ESSENCE and PAS records.
  - Common variables such as medical record number, patient name, date of visit, age, sex, race, and ethnicity, among others, may be used to link the two files.
- This will potentially allow several things, including:
  - Identify cases of opioid-related emergency room visits that may not have been captured by the other system.
  - Refine opioid-related case definitions to be used in both systems.
  - Establish methodologies for future linkages of these systems for conditions and situations beyond this particular grant.

# Linking ESSENCE and PAS

First Quarter 2016 PAS and ESSENCE Emergency Room Visits		
	ESSENCE	PAS
All Overdose- related Visits	3,902	22,586*
All Opioid Overdose/Abuse Visits	287	2,367
All Heroin Overdose/Abuse Visits	157	512
*Analysts are working to develop a comprehensive list of ICD-10-CM codes associated with all drug overdoses. Collaboration with CDC and other grantees will help establish appropriate codes.		

Source: Bureau of Health Care Analysis and Data Dissemination and  
Bureau of Reportable Disease Informatics, Missouri Department of Health and Senior Services

## Strategy 2- Fatal Opioid Overdose Reporting

- Increase the timeliness of fatal opioid overdose and associated risk factor reporting.
- Target area will be a subset of Missouri counties.
- DHSS will partner with medical examiner and coroner offices across the state to integrate Missouri Death Certificates with Medical Examiner/Coroner (ME/C) reports in cases of suspected opioid overdoses.
  - Time Period: July 1, 2016 through December 31, 2018

# Reporting Timetable

<b>Date of Opioid-Involved Overdose Death</b>	<b>Data Entry on All Opioid-Involved Overdose Deaths Initiated</b>	<b>Data Entry on All Opioid-Involved Overdose Deaths Completed</b>
July 1, 2016 to December 31, 2016	June 30, 2017	August 31, 2017
January 1, 2017 to June 30, 2017	December 31, 2017	February 28, 2018
July 1, 2017 to December 31, 2017	June 30, 2018	August 31, 2018

# Target Area

- Per grant requirements, DHSS reached out to ME/C offices with high frequencies of overdose deaths.
- The counties shown in orange represent just over 75% of 2014 unintentional and undetermined drug overdoses (UUDO) statewide.

Target Area (Strategy 2) Map



Source: Bureau of Health Care Analysis and Data Dissemination, Missouri Department of Health and Senior Services

# Target Area Demographics

<b>Geography</b>	<b>Population</b>	<b>Male</b>	<b>Female</b>	<b>Minority</b>	<b>Overdose ER Visits, 2014</b>	<b>UUDO, 2014</b>
U.S.	314,107,072	49.2%	50.8%	37.2%	n/a	41,541
Missouri	6,028,076	49.0%	51.0%	19.5%	55,077	949
Target Area	4,108,400	48.6%	51.4%	24.1%	37,724	746

Source: U.S. Census Bureau; American Community Survey, 2010-2014 American Community Survey 5-Year Estimates

## Strategy 2- continued

- Data will be abstracted by analysts at DHSS and entered into the overdose module of the web-based National Violent Death Registry System (NVDRS).
- Medical Examiners and Coroners
  - More than 20 offices have committed to providing complete ME/C report (including toxicology results) to DHSS.
  - ME/C offices will be compensated \$30 for every complete report provided to DHSS.
  - All local ME/C offices are encouraged to participate and reach out to DHSS with any questions or concerns.

# Opioid Overdose Case Definition

- Drug poisoning deaths where the ME/C report indicates that an opioid contributed to death.
  - ICD-10 underlying cause-of-death codes on the death certificate are X40–44 (unintentional) or Y10–Y14 (undetermined intent) AND any of the ICD-10 codes T40.0, T40.1, T40.2, T40.3, T40.4, or T40.6 are indicated in the multiple cause-of-death codes.

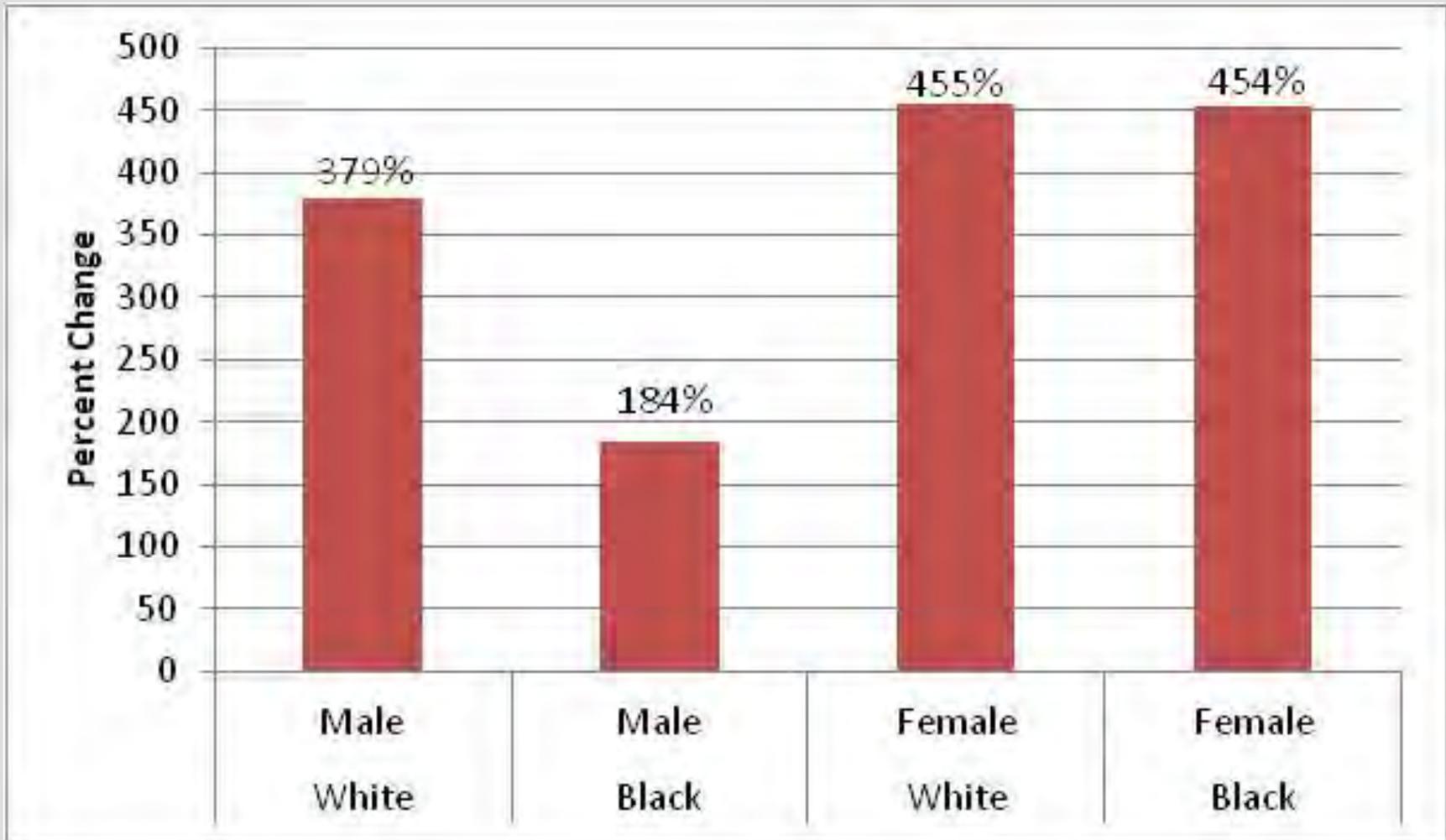
# Data Analysis

- Once data has been abstracted, DHSS staff will run a variety of statistical analyses, including:
  - Time-space trend analyses
  - Risk factor analyses

## Initial list of Demographic/Risk Factors to analyze:

- Sex
- Age
- Race
- Ethnicity
- Educational attainment
- Occupational industry
- History of opiate/other drug abuse
- History of mental illness

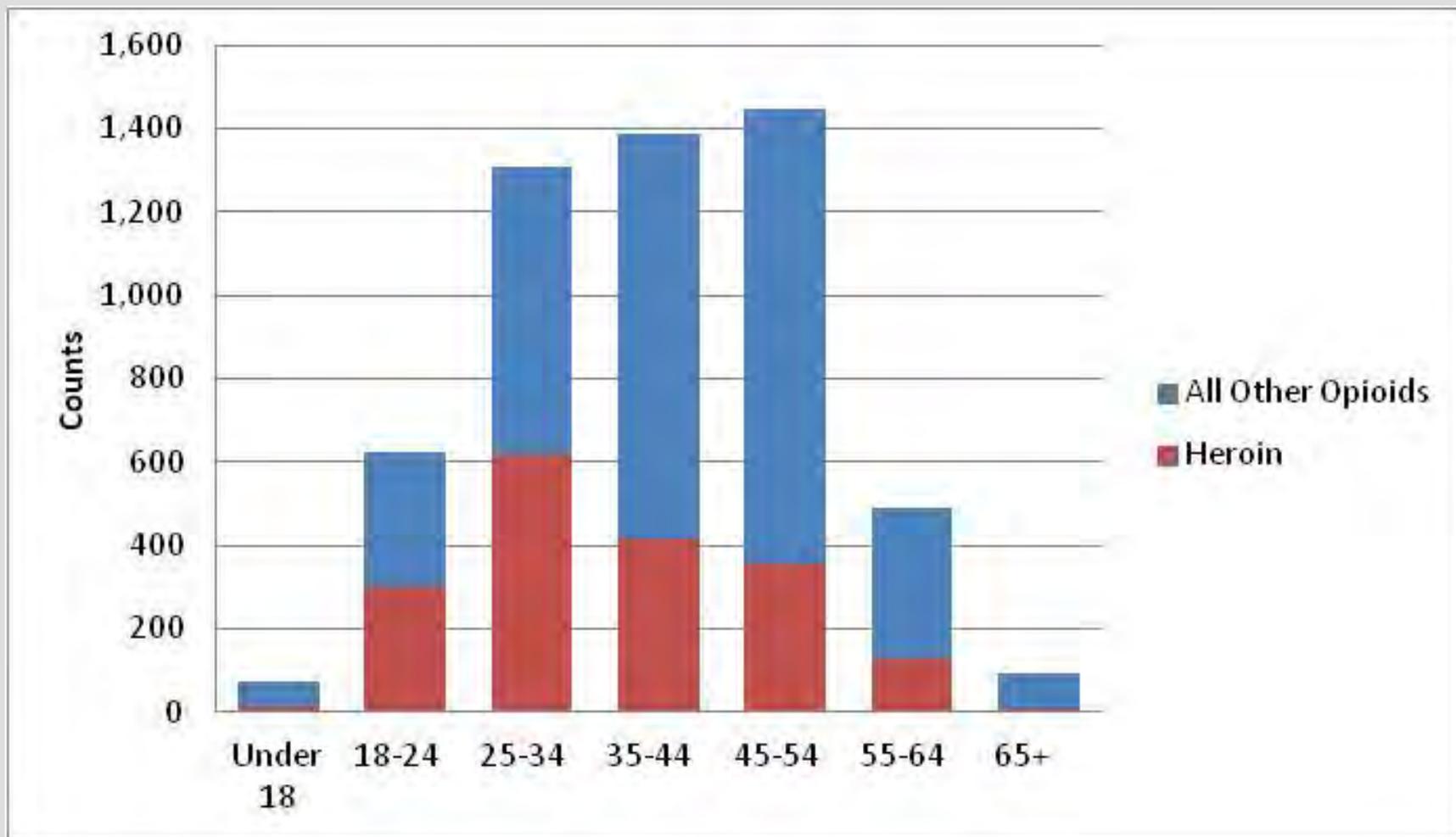
## Demographic Differences in Missouri Heroin Deaths, 2001-2014



Source: Bureau of Vital Statistics, Missouri Department of Health and Senior Services

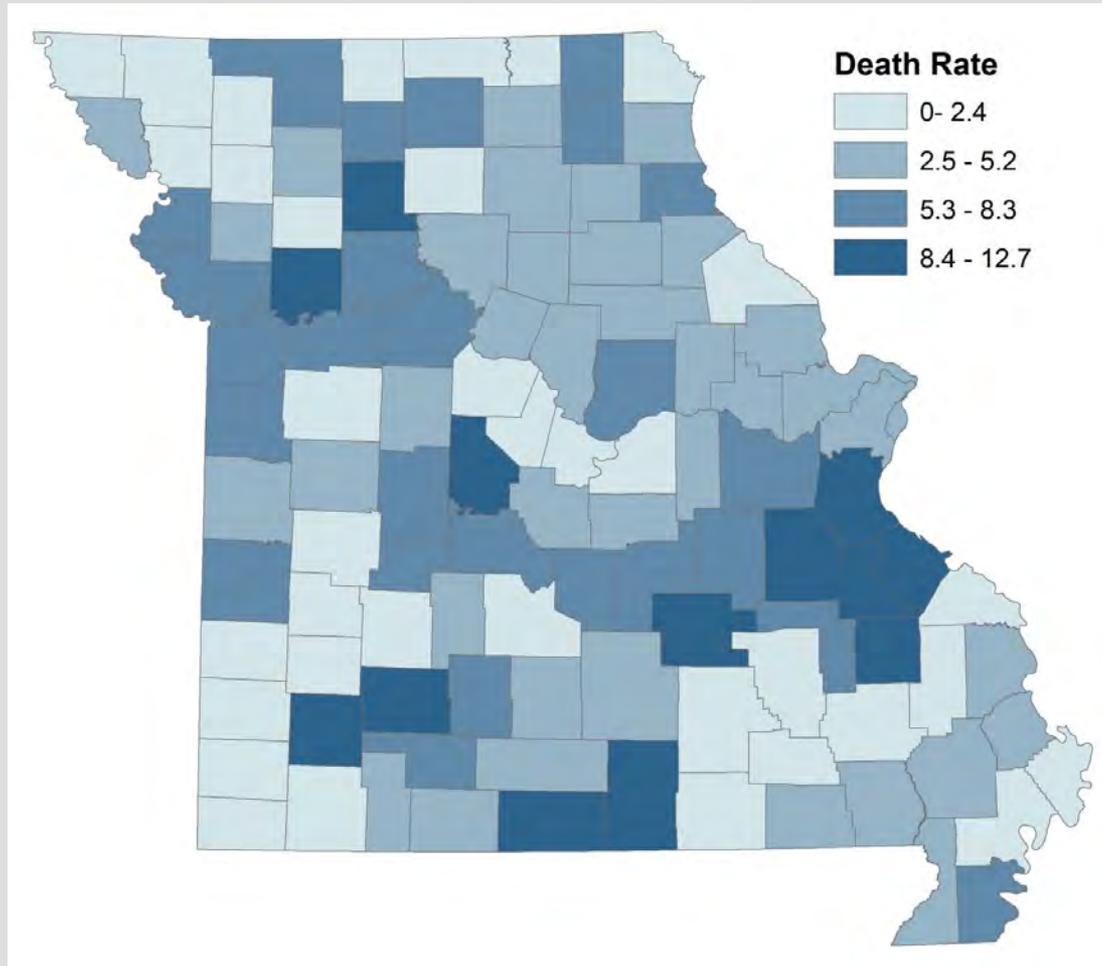
Percent change values compare the 2008-2014 rates to the 2001-2007 rates.

## Age Differences in Missouri Opioid Deaths, 2001-2014



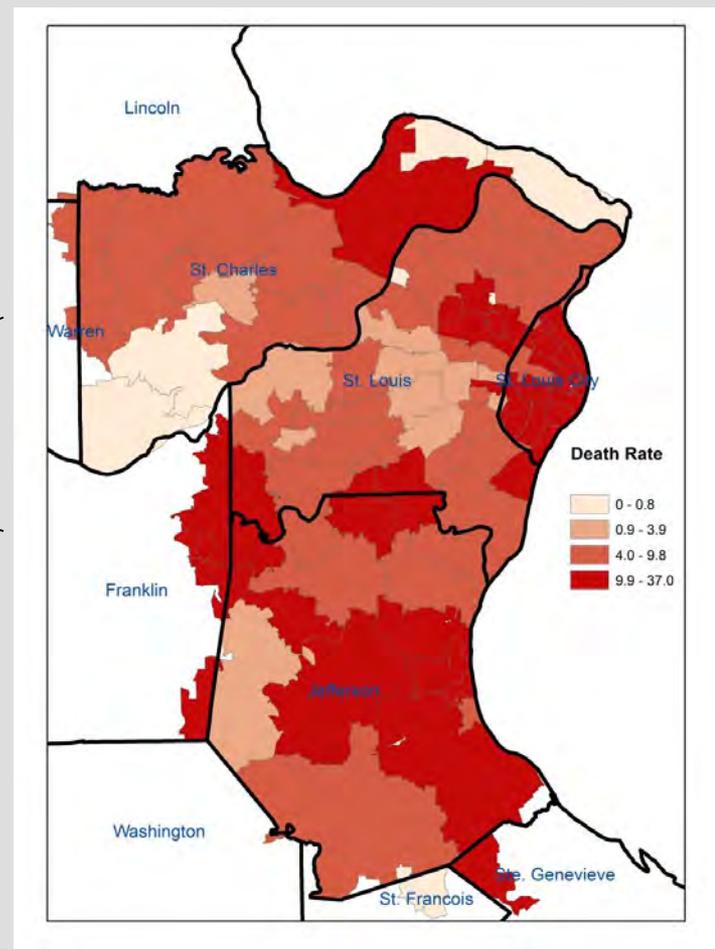
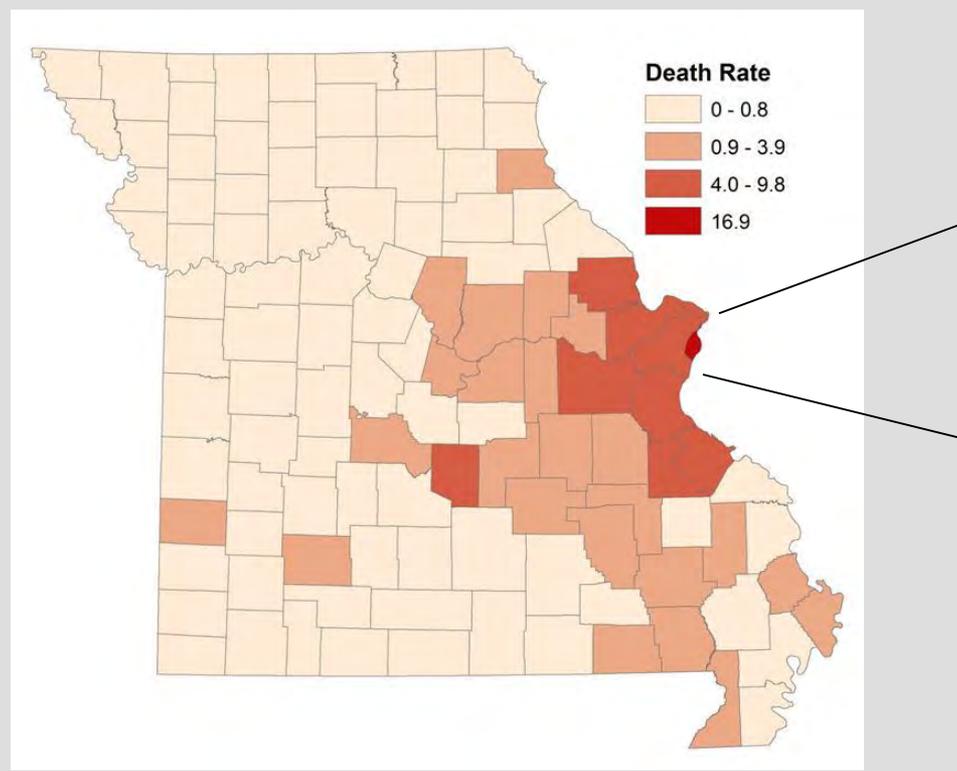
Source: Bureau of Vital Statistics, Missouri Department of Health and Senior Services

## Non-Heroin Opiate Death Rates (per 100,000), 2008-2014



Source: Bureau of Vital Statistics, Missouri Department of Health and Senior Services

# Heroin Death Rates (per 100,000), 2008-2014 Missouri and St. Louis Area Zip Codes





## Strategy 3- Data Dissemination

- Disseminate opioid surveillance findings to key stakeholders working to prevent or respond to opioid overdoses.
- Data dissemination unit housed within BHCADD will continually revise dissemination strategies based on stakeholder feedback.
- Activities include:
  - New opioid overdose website
  - Annual report
  - Development of Fact Sheets for areas with high rates/increases
  - Presentations to local stakeholders
  - Respond to data requests

# Focus Articles

## *FOCUS*

A PUBLICATION OF THE

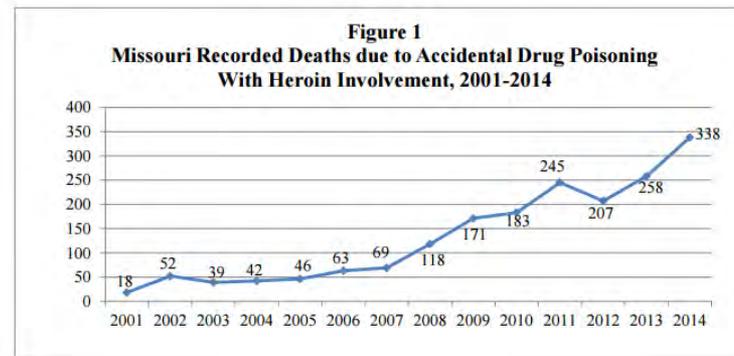
MISSOURI DEPARTMENT OF HEALTH & SENIOR SERVICES  
BUREAU OF VITAL STATISTICS  
JEFFERSON CITY, MISSOURI 65102-0570  
(573) 751-6272

December 2015

### Accidental Drug Poisoning Deaths With Heroin Involvement in Missouri

The number of heroin-involved accidental drug poisoning deaths which occurred in Missouri increased from 18 in 2001 to 338 in 2014 (Figure 1).<sup>1</sup> There were 1,849 heroin-involved deaths recorded during this period with 1,520 (82.2%) occurring from 2008 through 2014. From 2008 to 2014 the number of heroin-involved deaths nearly tripled, from 118 to 338.

For the period 2001 to 2014 statewide (Table 1), the male rate of heroin-involved deaths was about four times the female rate (3.7 vs. 0.9 per 100,000 population, respectively). The Black non-Hispanic rate of 4.4 per 100,000 population was about double the white rate (2.2). By age, the highest rates were for persons ages 25-34 (5.9).



# Community Data Profiles and MICAS

## Emergency Room Visit Profile - for Missouri Residents

All Race

Emergency Room Visit Indicators

	Data Years	Number of Events	Rate	Significantly Different	Ranking Quintile	Trend Lines	Comparison Bar Graphs	Download Data
All Diseases/Conditions	2013	2,231,408	378.5			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<a href="#">Infection</a>	2013	51,123	9.0			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<a href="#">Viral Infections</a>	2013	30,147	5.3			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<a href="#">Neoplasms (Cancer and Other Growths)</a>	2013	2,723	0.4			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<a href="#">Nutritional/Metabolic/Immunity</a>	2013	29,645	4.8			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<a href="#">Fluid and Electrolyte Disorders (Dehydration)</a>	2013	11,638	1.9			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<a href="#">Diabetes Mellitus</a>	2013	12,103	1.9			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<a href="#">Blood and Blood-Forming</a>	2013	5,791	1.0			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<a href="#">Anemia</a>	2013	4,315	0.7			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<a href="#">Mental Disorders</a>	2013	81,405	13.9			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<a href="#">Alcohol- and Substance-Related Mental Disorders</a>	2013	24,410	4.2			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<a href="#">Anxiety-Related Disorders</a>	2013	20,739	3.5			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<a href="#">Brain/Spinal Cord/Eyes/Ears</a>	2013	202,536	35.0			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<a href="#">Headache/Migraine</a>	2013	59,600	10.4			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<a href="#">Eye Infections</a>	2013	16,313	2.9			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<a href="#">Otitis Media and Related Conditions</a>	2013	38,773	7.0			<input type="checkbox"/>	<input checked="" type="checkbox"/>	

# MICA Newsletters

## MICA User Group Newsletter

September 2015 Issue #13

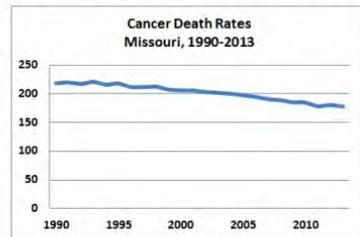
In 2013, cancer remained the second leading cause of Missouri resident deaths, behind only heart disease. Heart disease and cancer have long been the two leading causes of death, both in Missouri and nationally, by a wide margin. The Death MICA allows users to analyze cancer mortality statistics to obtain a good deal of information, including demographics of cancer decedents, recent trends in cancer mortality rates, and the leading types of cancer deaths in Missouri. (Data related to cancer incidence are available through the Cancer Registry MICA, which will be covered in a later issue of this newsletter.)

Cancer is a general name used to describe a large and complex group of diseases that share some common characteristics. Cancer begins “when cells in a part of the body start to grow out of control... [They] continue to grow and form new, abnormal cells.” Cancer cells are unique because they have the ability to expand into other tissue. Rapid growth of abnormal cells and the ability to expand to other parts of the body are two common traits found in all forms of cancer.<sup>1</sup> Statewide, 12,902 residents died from cancer in 2013. In fact, just over 22.5 percent of all deaths in the state were attributed to this disease. The Death MICA can be used to compare cancer with other leading causes of death in Missouri.

Leading Causes of Death: Missouri, 2013			
Rank	Disease	Count	Rate
1	Heart Disease	14,036	193.8
2	Cancer	12,902	178.7
3	Chronic Lower Respiratory Disease	3,800	52.9
4	Unintentional Injury	2,965	46.7
5	Stroke	2,913	40.3
	All Causes	57,256	804.9

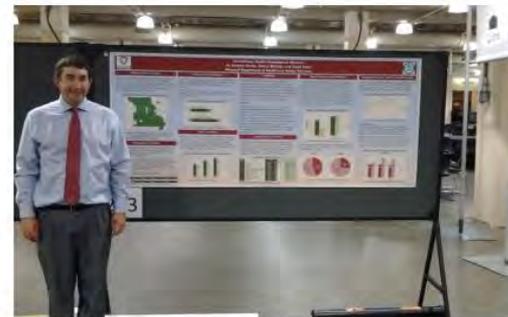
Death rates are reported per 100,000 residents and are age adjusted to the 2000 U.S. standard population.

Cancer and other leading causes of death can also be easily tracked over time using the Death MICA, which provides mortality statistics going back to 1990. Since 1990, the clear trend has been declining death rates. This is true for cancer and heart disease as well as all causes overall (the sum of all Missouri resident deaths, regardless of the specific cause). For instance, from 1990 to 2013 the heart disease mortality rate declined a massive 41 percent. While declines in cancer death rates have not been as dramatic, the 18.3 percent cancer mortality decline is larger than the all causes decrease of 14.9 percent. The trend line on the left shows that the cancer mortality rate decline has been steady. The 2013 rate is statistically significantly lower than the rates in all years from 1990 through 2009.



Death rates are reported per 100,000 residents and are age adjusted to the 2000 U.S. standard population.

Her presentation, titled “Behind Missouri’s Health Data Trainings: The Making of Health Data Rock Stars” is available at <https://cste.confex.com/cste/2015/webprogram/Session2950.html>.



Andy presented a poster on “Rural and Urban Health Disparities in Missouri.” The poster highlighted the key findings of the *2012-2013 Health in Rural Missouri Biennial Report* but incorporated more recent data. The poster abstract is available at <https://cste.confex.com/cste/2015/webprogram/Session3222.html>.

# Committed Partners for Surveillance and Dissemination

- At least 20 local ME/C offices
- DHSS, Bureau of Community Health and Wellness and the Injury Prevention Program
- DHSS, Bureaus of Reportable Disease Informatics and Communicable Disease Control and Prevention
- DHSS, Bureau of Vital Statistics
- DHSS, NVDRS Grant Principal Investigator
- DHSS, Office of Minority Health
- DHSS, Office of Primary Care and Rural Health
- **DHSS, Office on Women's Health**
- Hospital Industry Data Institute (HIDI), The Data Company of the Missouri Hospital Association
- Midwest HIDTA
- Missouri Department of Mental Health, Division of Behavioral Health
- Missouri State Registrar
- National Council on Alcoholism and Drug Abuse- St. Louis Area
- Regional Heroin and Opiates Steering Committee

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