

**POTENTIAL USES OF SYNDROMIC  
SURVEILLANCE TO STUDY  
SUBSTANCE AND OPIOID ABUSE -  
CLARK COUNTY, NEVADA**

**Linda Verchick MS**

**Kathryn Barker MPH**

# OBJECTIVES

- Provide overview of Clark County, NV population levels
- Describe current uses of Syndromic Surveillance
- Review the current status of ESSENCE development
- Describe current levels of substance abuse in Clark County
- Illustrate use of ESSENCE to quantify Opioid abuse
- Outline future uses of SyS to describe injury related hospitalizations and deaths

# CLARK COUNTY NEVADA

- 2,119,834 estimated 2016 population
- > 42m visitors in 2015
- >21k conventions with 5.8m attendees
- Life is Beautiful 120k attendees downtown
- Electric Daisy Carnival 135k LV Speedway
- National Finals Rodeo 177.5k (2015)
- New Year's Eve 330k (2015)

# SYNDROMIC SURVEILLANCE (SYS) NEVADA

- BioSense 2.0
  - Weekly Substance Abuse Report
  - Historical surveillance through July 2016
  - Use ends December 31, 2016
- ESSENCE went live Jan/Feb 2016
  - 15/17 hospitals in Clark County participate
  - Data completeness
    - ~98% chief complaint
    - Variable for ICD-10-CM codes (not a required field)

# ESSENCE NEVADA UTILIZATION

## Current

- Weekly syndromic illness reports
- Opioid surveillance (in development)

## Future

- Weekly substance abuse reports (current=BioSense2.0)
- Injury surveillance
- Event-based
  - Tourism in Las Vegas

# SYS ILLNESS

- NAC 441A.920 plus additional syndromes/illnesses
  - ILI
  - hemorrhagic illness +/-fever
  - SOB +/- fever
  - lymphadenitis +/- fever
  - rash, blisters, lesions +/- fever
  - GI syndrome
  - sepsis/shock,
  - Neurological syndrome + fever
  - fever only,
  - fever or chills,
  - paralysis
  - pertussis
  - Excessive heat
- Documented weekly on form reported at bi-weekly meetings

MMWR week

48

Syndromic surveillance is an important component for monitoring the overall health of Clark County residents and visitors. The Southern Nevada Health District currently uses two programs to watch for abnormal increases in specific conditions that could indicate something unusual is occurring; Electronic Surveillance System for the Early Notification of Community Based Epidemics (ESSENCE) and Real-time Outbreak and Disease Surveillance (RODS). ESSENCE captures the primary complaints of people visiting hospital emergency rooms. Complaint data is available for analysis by public health agencies much quicker than diagnostic data. The RODS program summarizes over the counter drug sales from participating pharmacies. The increase in sales of medications could inform public health of increases in community illness.

**ESSENCE SURVEILLANCE**  
(Using an Adaptive Multiple Regression Model)

- |                                    |   |  |  |
|------------------------------------|---|--|--|
| Influenza Like Illness             | <input type="radio"/> Normal            | <input type="radio"/> Warning            | <input checked="" type="radio"/> Alert |
| Lymphadenitis, +/- Fever           | <input checked="" type="radio"/> Normal | <input type="radio"/> Warning            | <input type="radio"/> Alert            |
| Gastrointestinal Syndrome          | <input checked="" type="radio"/> Normal | <input type="radio"/> Warning            | <input type="radio"/> Alert            |
| Hemorrhagic Illness, +/- Fever     | <input checked="" type="radio"/> Normal | <input type="radio"/> Warning            | <input type="radio"/> Alert            |
| Sepsis, Shock                      | <input checked="" type="radio"/> Normal | <input type="radio"/> Warning            | <input type="radio"/> Alert            |
| Shortness of Breath, +/- Fever     | <input type="radio"/> Normal            | <input type="radio"/> Warning            | <input checked="" type="radio"/> Alert |
| Rash, Blisters, Lesions, +/- Fever | <input checked="" type="radio"/> Normal | <input type="radio"/> Warning            | <input type="radio"/> Alert            |
| Neurological syndrome, Fever       | <input checked="" type="radio"/> Normal | <input type="radio"/> Warning            | <input type="radio"/> Alert            |
| Paralysis                          | <input checked="" type="radio"/> Normal | <input type="radio"/> Warning            | <input type="radio"/> Alert            |
| Pertussis                          | <input checked="" type="radio"/> Normal | <input type="radio"/> Warning            | <input type="radio"/> Alert            |
| Excessive Heat                     | <input type="radio"/> Normal            | <input checked="" type="radio"/> Warning | <input type="radio"/> Alert            |

Actions taken

None.

Comments

# SYS SUBSTANCE ABUSE

- Existing Substance Abuse ED Visits report
  - Liliana Wilbert, SyS Epidemiologist, NDPBH
  - Data obtained via SQL - BioSense 2.0 data locker
    - Terms used to search chief complaint field

Drugs	OD	Drug OD	marijuana	pot
heroin	meth	opioid	cocaine	coke
ecstasy	extasy	LSD	acid	PCP
angel dust	crank	crack	crystal	molly
dex	roofies	alcohol	ETOH	drunk
fentanyl	fentinyll	oxy	oxycontin	alderol
Vicodin				

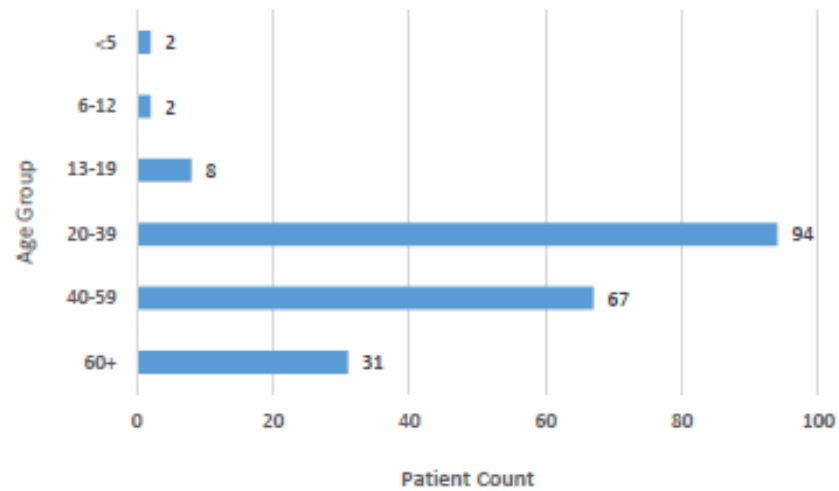
- Layer of manual review applied to remove false positives
- Exclusion criteria: Denies, Oxygen, Acid, Paroxysmal, PCP
- EpiInfo - obtain frequencies by facilities, gender, age grouping



## Frequency of patients by facility

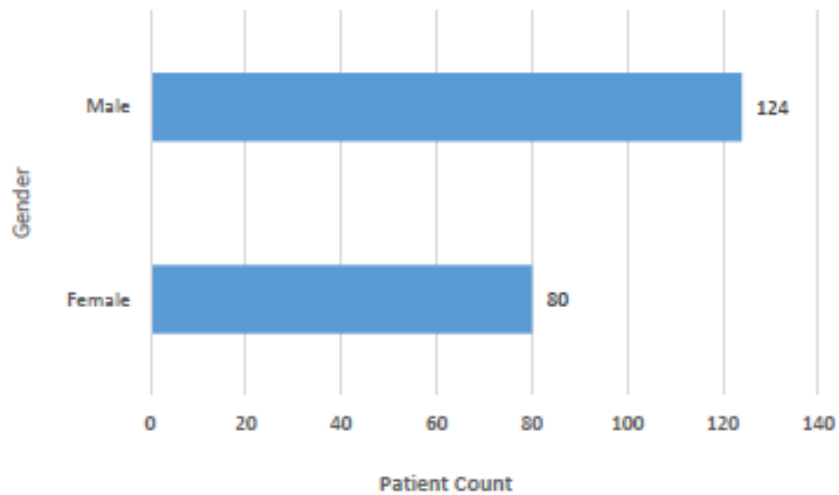
Facility Name	Frequency	Percent
Boulder City hospital	1	0.49%
Centennial Hills Hospital	16	7.84%
Desert Spring Hospital	23	11.27%
Henderson Hospital	14	6.86%
Mesa View Hospital	6	2.94%
Mountain's Edge Hospital	1	0.49%
Mountain View Hospital	9	4.41%
Southern Hills Hospital	5	2.45%
Spring Valley Hospital	19	9.31%
St. Rose Dominican Hospital - Rose de Lima Campus	1	0.49%
St. Rose Dominican Hospital - Siena Campus	5	2.45%
Summerlin Hospital	20	9.80%
Sunrise hospital	35	17.16%
Valley Hospital	49	24.04%
<b>TOTAL</b>	<b>204</b>	<b>100.00%</b>

## Frequency of patients by age group



## Frequency of patients by gender

\*\*\*"Other" and "Unknown" are omitted due to no reports of either category.



# CLARK COUNTY NEVADA OPIOID MEDICAL ENCOUNTERS STUDY

- 3 year study hospital discharge data 2011-13
- 200,000 Inpatient Hospitalization/yr
- 500,000 ED visits/yr
- 13-20% injury primary dx
- Opioid-related intoxications
  - 4,631 ED visits and
    - ¼ of drug-induced ED visits
  - 5,016 inpatient hospitalizations (IHs)
    - ½ of drug-induced hospitalizations
  - Overall rate of opioid-related intoxications was 161/100,000

Feng, J, Iser, J P, and Yang, W. *Medical encounters for opioid-related intoxications in Southern Nevada: sociodemographic and clinical correlates.* BMC Health Services Research (2016) 16:438 DOI 10.1186/s12913-016-1692



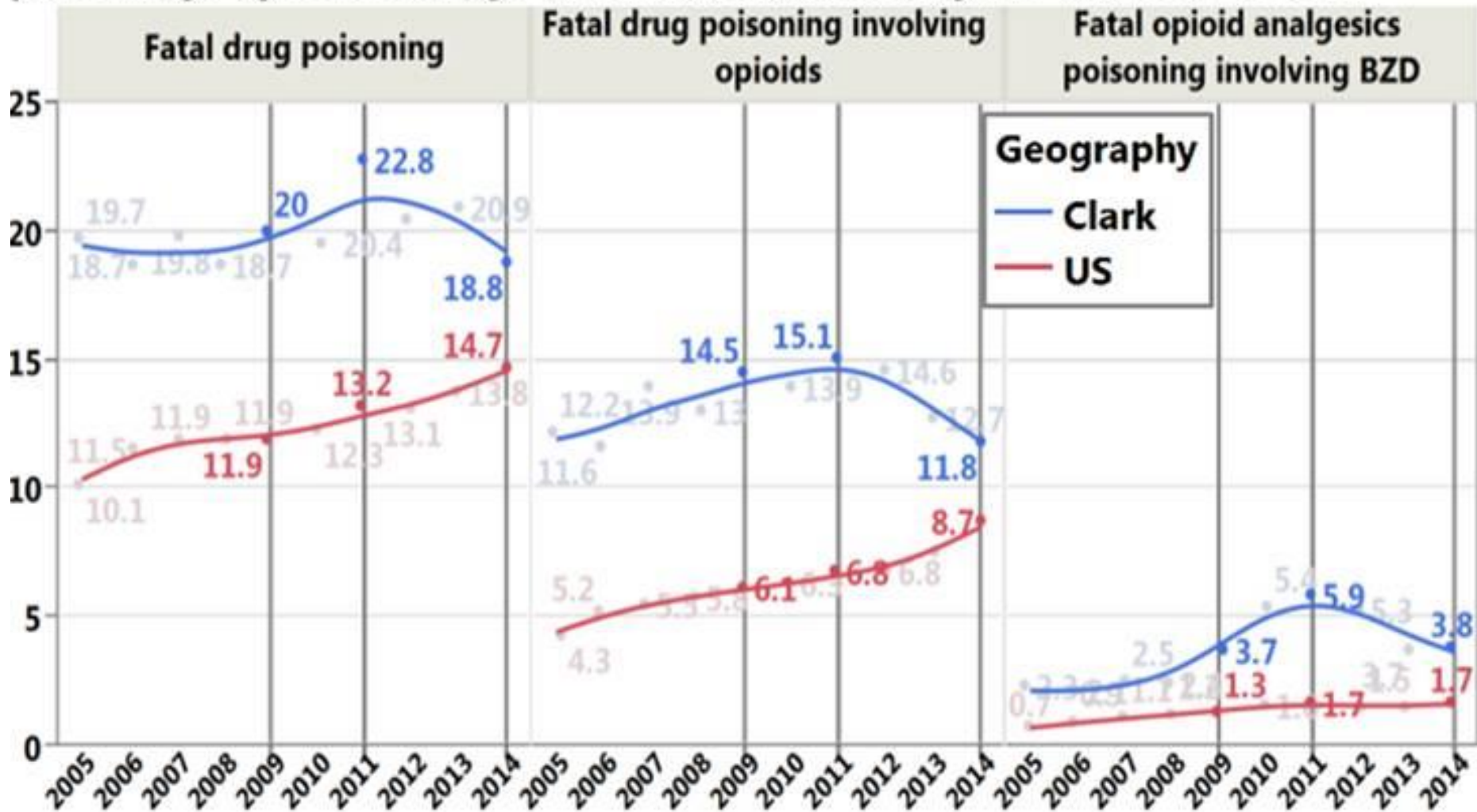
# CLARK COUNTY NEVADA OPIOID MEDICAL ENCOUNTERS STUDY

- Opioid OD, poisoning, drug dependence, drug abuse
  - OD or poisoning (ICD-9 965.0)
  - Opioid–type drug dependence/abuse ( ICD-9 304.0, 304.7, 305.5)
- 87% IH and 91% ED (E-code)
  - Accidental opioid poisoning (E850.0-E850.2)
  - Adverse opioid effects (E935.0-E935.2)

Feng, J, Iser, J P, and Yang, W. *Medical encounters for opioid-related intoxications in Southern Nevada: sociodemographic and clinical correlates*. BMC Health Services Research (2016) 16:438 DOI 10.1186/s12913-016-1692



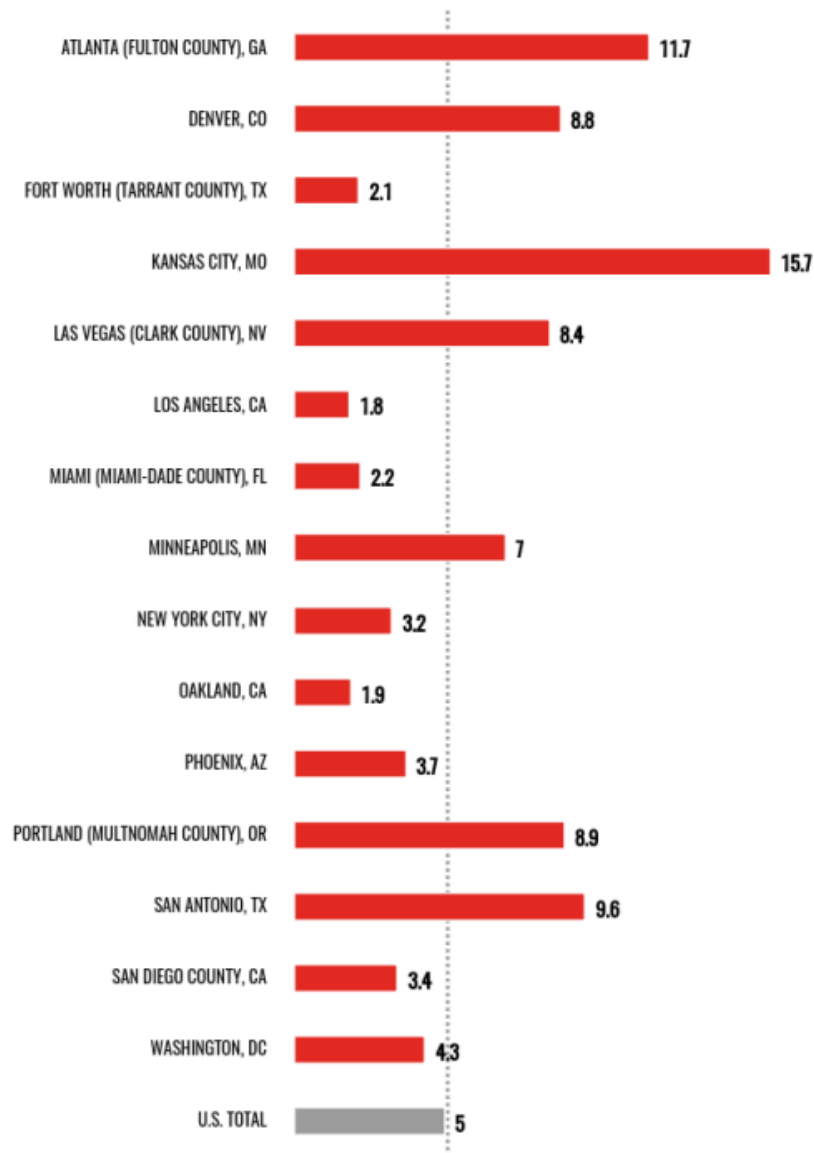
**Figure 1. Age-adjusted death rates (AjR) per 100,000 persons due to drug poisonings by select drugs involved, Clark County-NV and US, 2005-14**



Source: MCOB data 1999-2014 on CDC WONDER Online Database.

# OPIOID-RELATED UNINTENTIONAL DRUG OVERDOSE MORTALITY RATE

RACE/ETHNICITY: ALL | SEX: BOTH | YEAR: 2014



Source: Big Cities Health Inventory. <http://bchi.bigcitieshealth.org/indicators/1826/2829>



## OPIOID-RELATED UNINTENTIONAL DRUG OVERDOSE MORTALITY RATE

CITY: LAS VEGAS (CLARK COUNTY), NV | RACE/ETHNICITY: ALL | SEX: BOTH | YEARS: 2012, 2013, 2014



Source: Big Cities Health Inventory <http://bchi.bigcitieshealth.org/cities/80/3049>

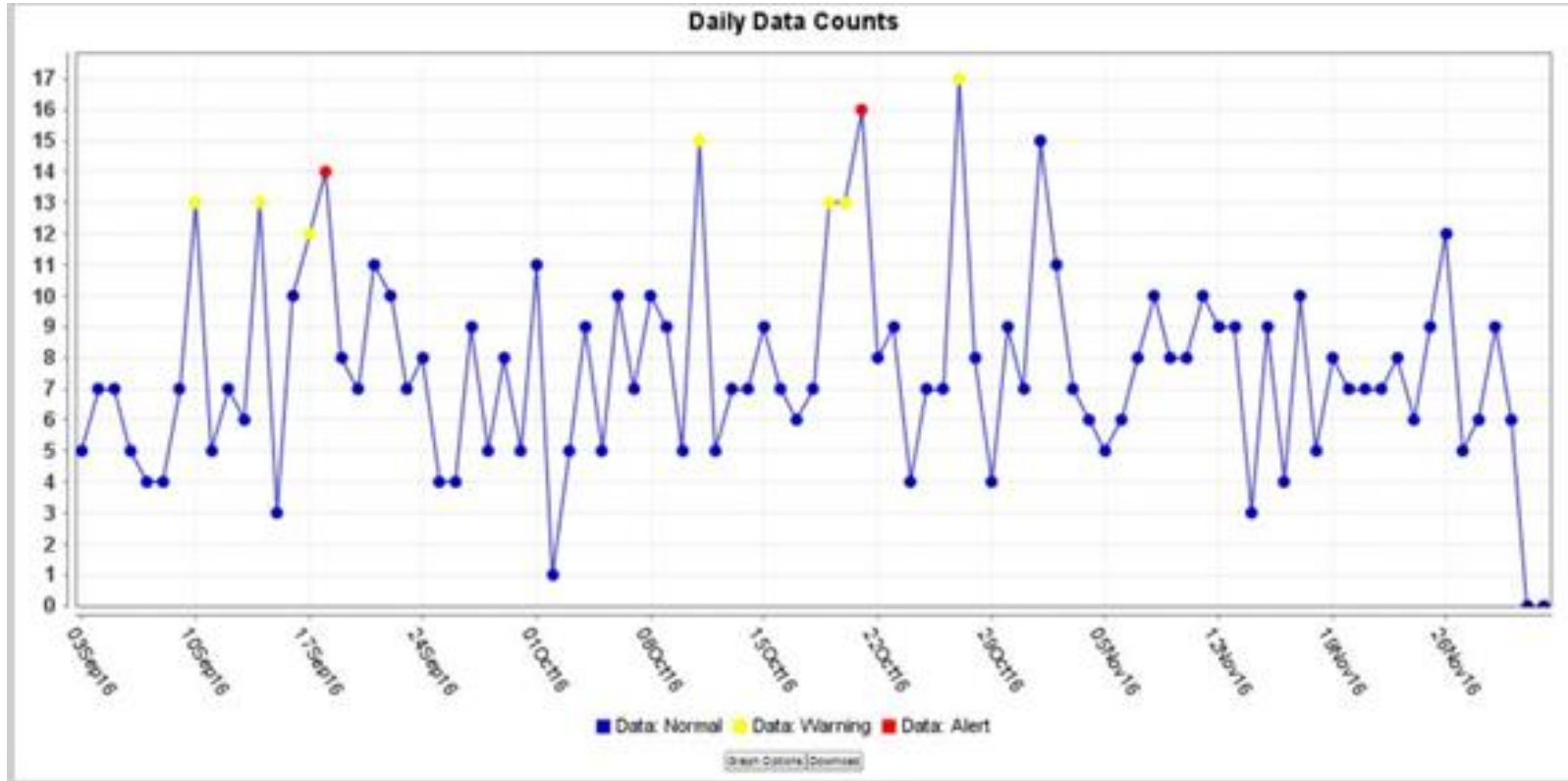


# OPIOID (RX DRUG AND HEROIN)

- Region 9 data sharing workgroup
- Opioid SyS to include Rx pain killers and heroin. Goal to develop reports on overdose and/or visits with demographic information
  - Using CDC SAS code (from Matt Gladden) to pull from chief complaint and ICD-10-CM diagnosis codes
    - Modifying SAS code to customize for each jurisdiction
  - Developing queries within ESSENCE to create alerts



# EXAMPLE QUERY: OPIOID CHIEF COMPLAINT



Search terms used in initial opioid query:

^opioid^,OR,^opoid^,OR,^opiat^,OR,^oxyco^,OR,^oxyi^,OR,^percoc^,OR,^vicod^,OR,^fentan^,OR,^narcan^,OR,^naloxo^,OR,^hydrocod^,OR,^codeine^,OR,^codiene^,OR,^codene^,OR,^morphin^,OR,^oxymor^,OR,^dilaud^,OR,^hydromor^,OR,^tramad^,OR,^analgesic^,OR,^analgsc^,OR,^opium^,OR,^methadone^,OR,^metadone^,OR,^narcotic^,OR,^heroin^,OR,^dope^,OR,^herion^,OR,^speedball^,OR,^speedball^,OR,^bupren^,OR,^suboxone^,OR,^subutex^



# EXAMPLE: OUTPUT FROM SAS CODE

Type of Visit	No. visits	% of visits between 6/1/2016 - 8/31/2016 (N=100,924)
Heroin	138	0.14%
-Acute Heroin	31	0.03%
-Chronic Heroin	107	0.11%
Any Opioid	365	0.36%
-Acute Opioid	97	0.10%
-Chronic Opioid	268	0.27%

# FUTURE USE OF SYS

- Exploring usefulness as a tool in:
  - Broader injury surveillance
    - Falls, drowning, traumatic brain injury, overexertion
  - Event-based/tourism
    - Identifying most common ED visits among tourists
    - Holidays, large-scale events, etc.

