Center for Interventions, Treatment & Addictions Research

Boonshoft School of Medicine
WRIGHT STATE UNIVERSITY

The Opioid Epidemics in Montgomery County, Ohio: Past, Present, Future

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Grand Rounds
Kettering Hospital
March 18, 2016

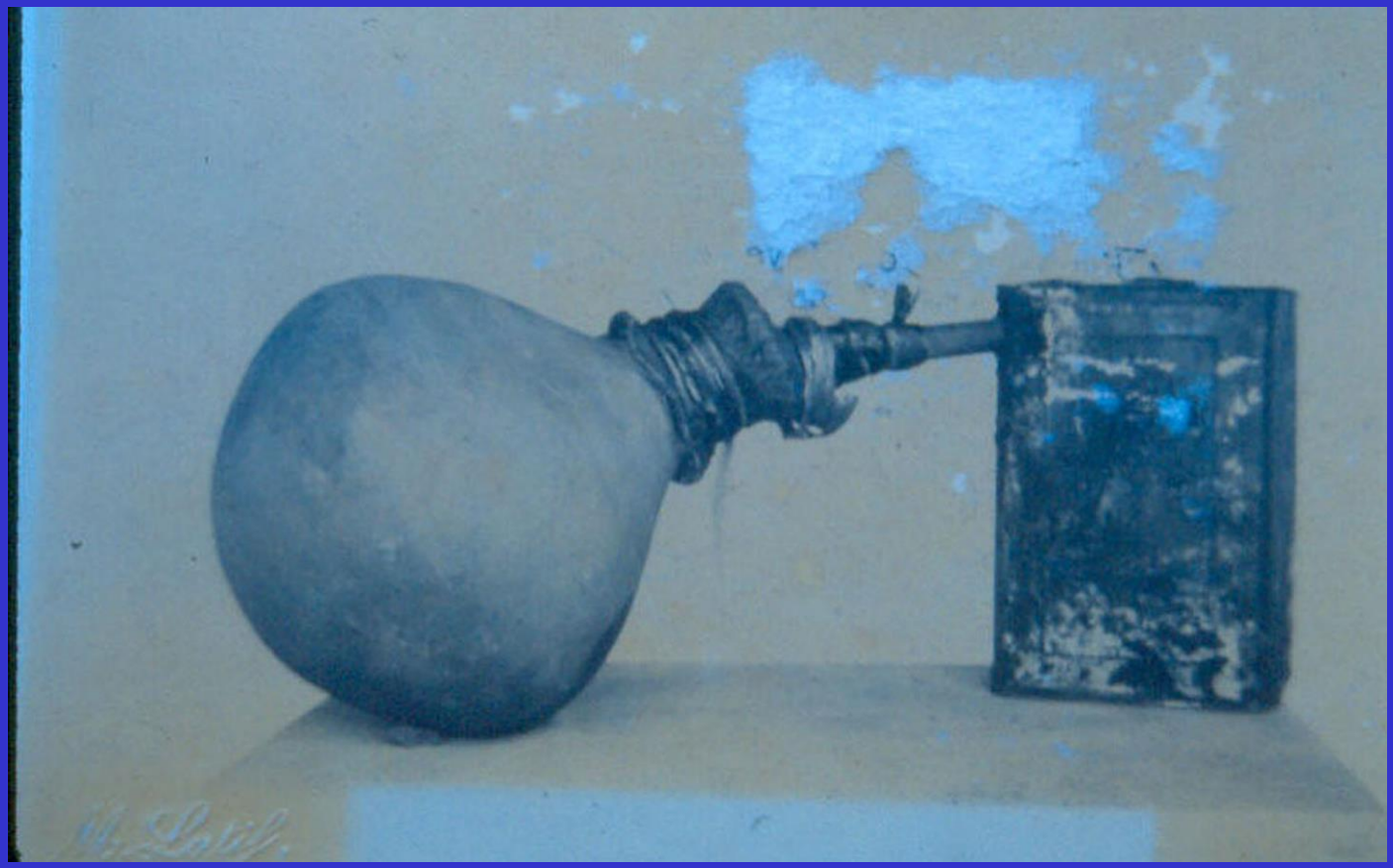
Today's Agenda

- a. Opioid use trends in Montgomery County;
- b. The inter-relationship between non-medical pharmaceutical opioid use and heroin;
- c. Predictors of heroin initiation;
- d. Unintentional overdose trends in Montgomery County.

Crushing Bananas in Beer Canoe

Adding Sorghum to Ferment

Distilling Banana Beer: French White Fathers



Hanging Out in Drug Copping Areas in Dayton: 1990s

Opioid Doses Dispensed to Ohio Patients, by year

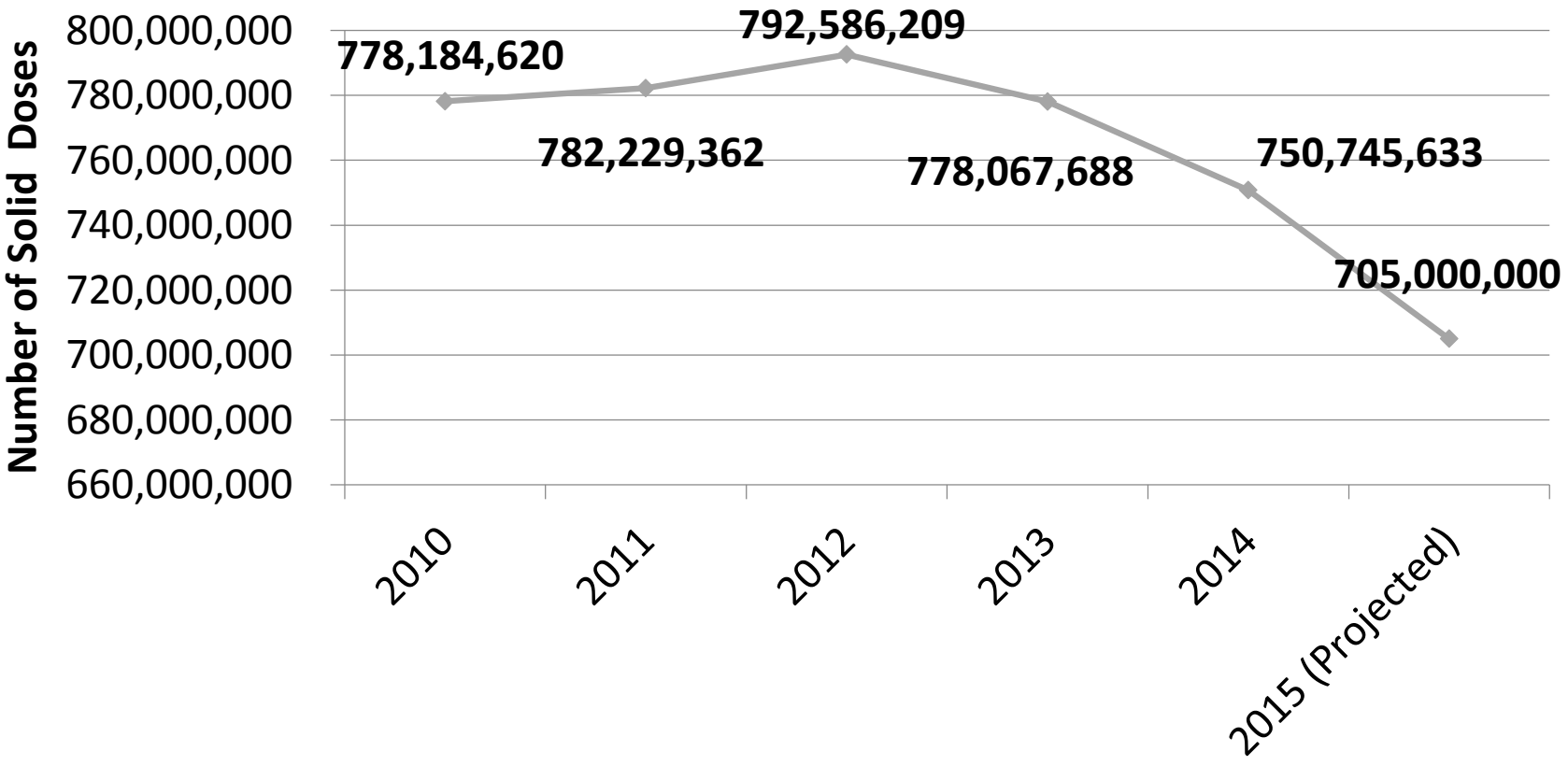
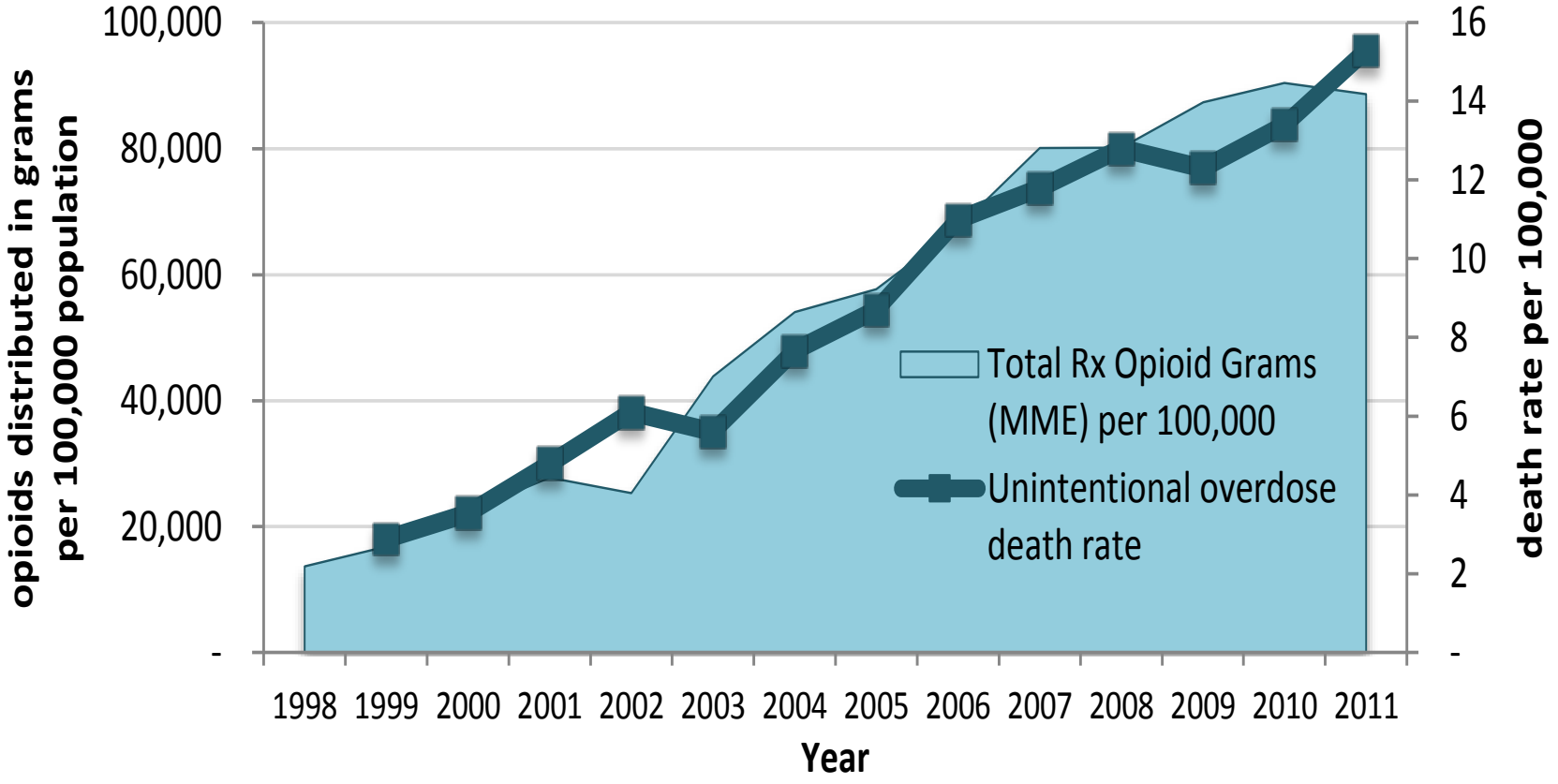


Figure 6. Unintentional Drug Overdose Death Rates and Distribution Rates of Prescription Opioids in Grams per 100,000 Population by Year, Ohio, 1998-2011[1-3]



Heroin: Trends Over Time

- 2000-2001:
  - Some reports about increasing availability of heroin in most areas of the state except Athens and Cincinnati
  - Increasing in purity, and selling for $200 - $250 per gram or more
  - Some reports about increasing abuse among white suburban youth and young adults who may start off inhaling the drug

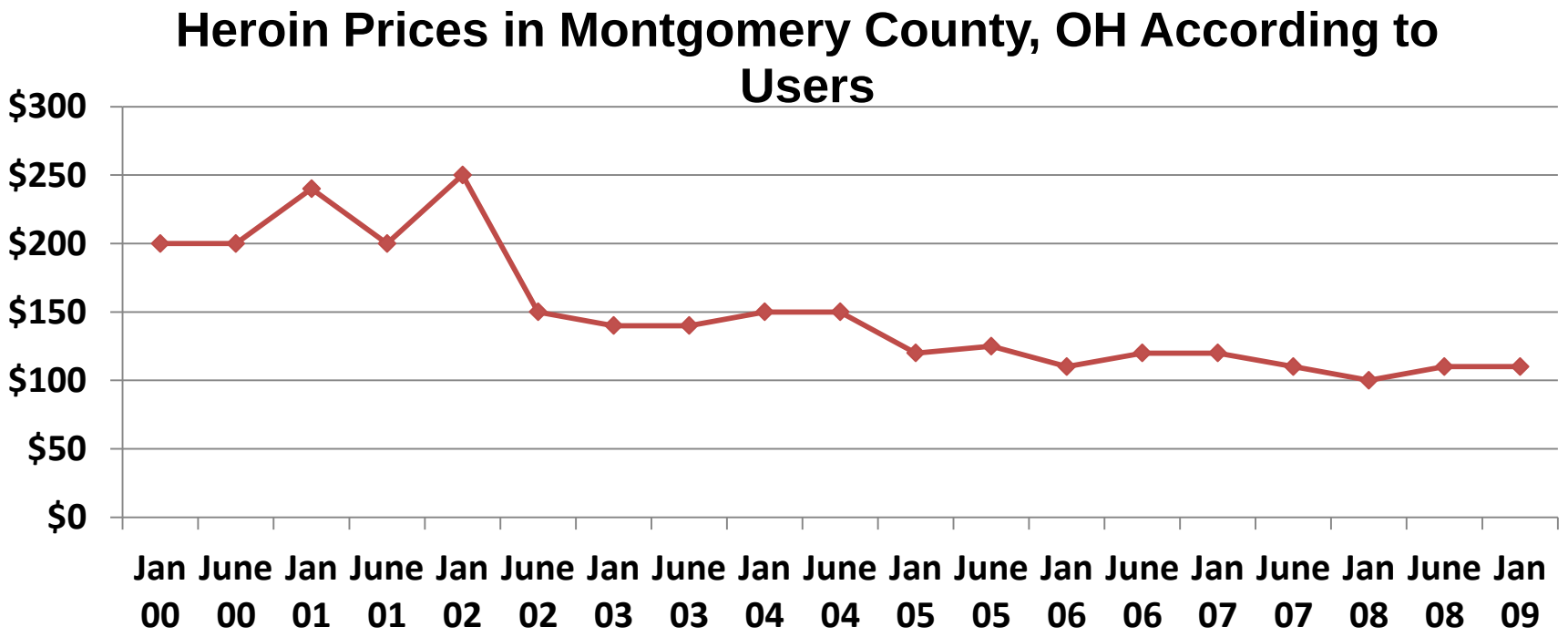
Heroin: Trends Over Time

- 1990s, heroin "Boy" was referred to as "dog food" due to low purity. The vast majority of clients in the local methadone clinic were African American. Whites who did inject strongly preferred using Dilaudiid.
- Similar to OxyContin, Dilaudid sold for about $1/mg. (Since, Dilaudid seems to have fallen to obscurity)
- 2002-2004:
  - Heroin availability continues to increase in most areas of the state.
  - Prices of heroin are decreasing: 2003 $150-$180/gram

-- Young adults primarily white, are the fastest growing groups of new heroin users.

- This was a tremendous "heads up" that was largely ignored, or acknowledged, by public health, but no significant action early.

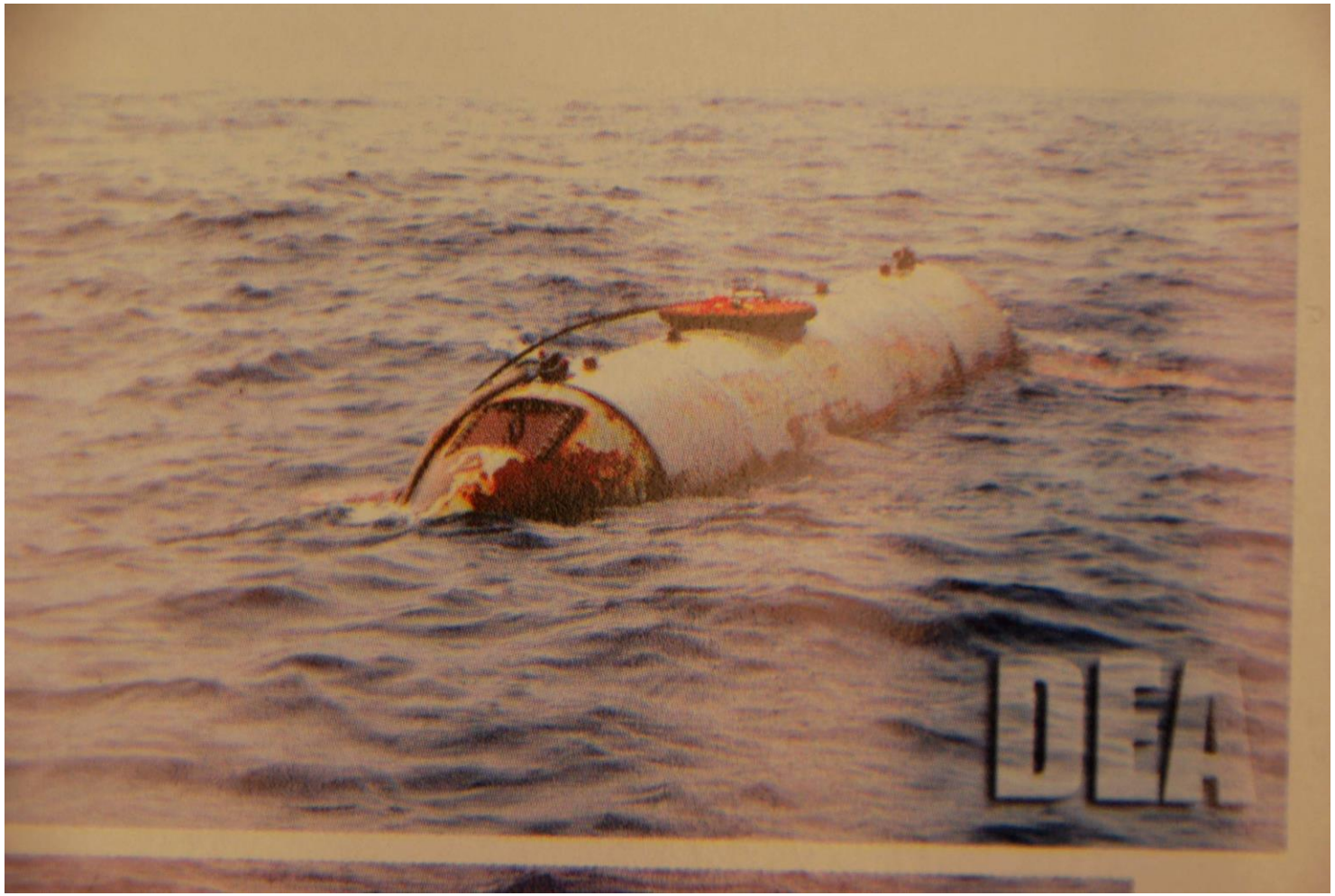
Trends in Heroin Prices Per Gram



--Huge increases in heroin availability and use across the state.

--Declining prices. Prices as low as $70-$90 per gram 2007 - present.

Increases in Heroin Availability



The OxyContin® – Heroin Connection: An Emerging Trend: June 2001

- Abuse of OxyContin® prior to heroin initiation first documented in 2001 in Dayton.
- An 18-yr old woman in Dayton said,

A: I think if, um, all my friends had never tried OxyContins, it would have never led to the heroin, never.

Interviewer: Do you know of anybody who went straight to shooting heroin?

A: No.

Interviewer: Everybody that you know who uses heroin…

A: …started out with OxyContins.

The Relationship Between OxyContin® and Heroin Abuse

1. Siegal, H.A., Carlson, R.G., Kenne, D.R., and Swora, M. (2003) Probable relationship between opioid abuse and heroin use. American Family Physician 67: 943-944.

2. **People on the streets talked about "the NEW HEROIN," "OC's." Initially, we were, "what are OC's"?**

3. **Pattern of becoming dependent on PO before heroin initiation was new in 2001. This is not something that happened to any extent previously.**

4. **The pattern became statewide over time and was documented in other parts of the nation.**

5. **2006, we interviewed 58 heroin users across the state; about 65% believed they were addicted to pharmaceutical opioids (mostly OxyContin®) before using heroin for the first time.**

Predictors of Transition to Heroin Use among Non-Opioid Dependent Illicit Pharmaceutical Opioid Users

NIH/NIDA Grant No. 1 R01 DA 023577

OBJECTIVES

- **Natural History study using mixed-methods approach to describe pharmaceutical opioid use trajectories over 36 months.**
- **Structured interviews every 6 months with participants over 3 years to identify characteristics associated with transition to opioid dependence, and/or heroin use.**

- **Carlson, R.G., Nahhas, R.W., Martins, S.S., Daniulaityte, R. (2016) Predictors of transition to heroin use among initially non-opioid dependent illicit pharmaceutical opioid users: A natural history study. Drug and Alcohol Dependence 160:127-134.**

Eligibility Criteria

1) 18–23 years old, Columbus, OH area
2) Self-report non-medical use of pharmaceutical opioids on at least 5 occasions in the past 90 days
3) Show no lifetime dependence on opioids based on DSM-IV criteria
4) Have no history of heroin use or drug injection. Assessed by self-report and visual inspection of arms for track marks

- Using respondent-driven sampling, we recruited 383 eligible participants between April 2009 and May 2010.
- *Informed Consent Approved by WSU IRB.*
- *Certificate of Confidentiality*

Methods:
Survival Analysis (Time to Heroin Use)

- Cox regression model
  - Hazard of transition to heroin use as a function of covariates

- Adjusted for covariates
  - Demographics
  - Use of PO to self-medicate (lifetime)
  - Non-oral use (lifetime)
  - Other drug use (lifetime)
  - Other drug dependence (lifetime)
  - Psychiatric comorbidity (lifetime)
  - Time-dependent covariates were *lagged*

- Time measured from initiation of PO use to 1st report of heroin use

Baseline Sociodemographics

- About 50% of the sample were white
- Of the non-whites, about 93% were African American
- About 54% were male
- About 40% had some post-high school education
- Almost 100% used immediate-release oxycodone
- About 90% returned for 6-month follow-up, 74% for 36 month.
- Overall, 362 (94.5%) returned for at least one follow-up interview.

Baseline Frequency of PO Use (n=362)

Variable	Level	(n=362) N	%
Freq of PO Use	≤ 1 day/week	163	45.0%
	About 2 days/week	26	31.0%
	3-7 days/week	1	24.0%

Results: Heroin Initiation

- **27 (7.5%) participants initiated heroin use. Rate 2.8% per year**
- **Mean time to heroin use: 6.2 years** (SD = 1.9 years)
  - **Range = 1.8 to 9.8 years**
- **Route of heroin administration**
  - **15 (55.5%) injected, 8 snorted only, 4 smoked only**
  - **3 of the 15 injectors snorted heroin first**

Demographics at Event or Censoring Time (n=362)

Variable	Level	Used Heroin (n=27)		Did Not Use Heroin (n=335)	
		Mean or N	SD or %	Mean or N	SD or %
Age of initiation of PO use (years)		15.8	1.6	17.1	2.0
Time from PO initiation to heroin/censoring (years)		6.2	1.9	6.7	2.1
Age 6m prior to event time (years)		21.4	1.8	23.3	1.7
Gender	Male	12	44.4%	153	45.5%
	Female	15	55.6%	183	54.5%
Race/Ethnicity	Black	0	0.0%	167	49.7%
	White	27	100%	153	45.5%
	Asian	0	0.0%	4	1.2%
	Native American	0	0.0%	9	2.7%

Multivariate adjusted associations between lagged predictors and hazard of transition to heroin

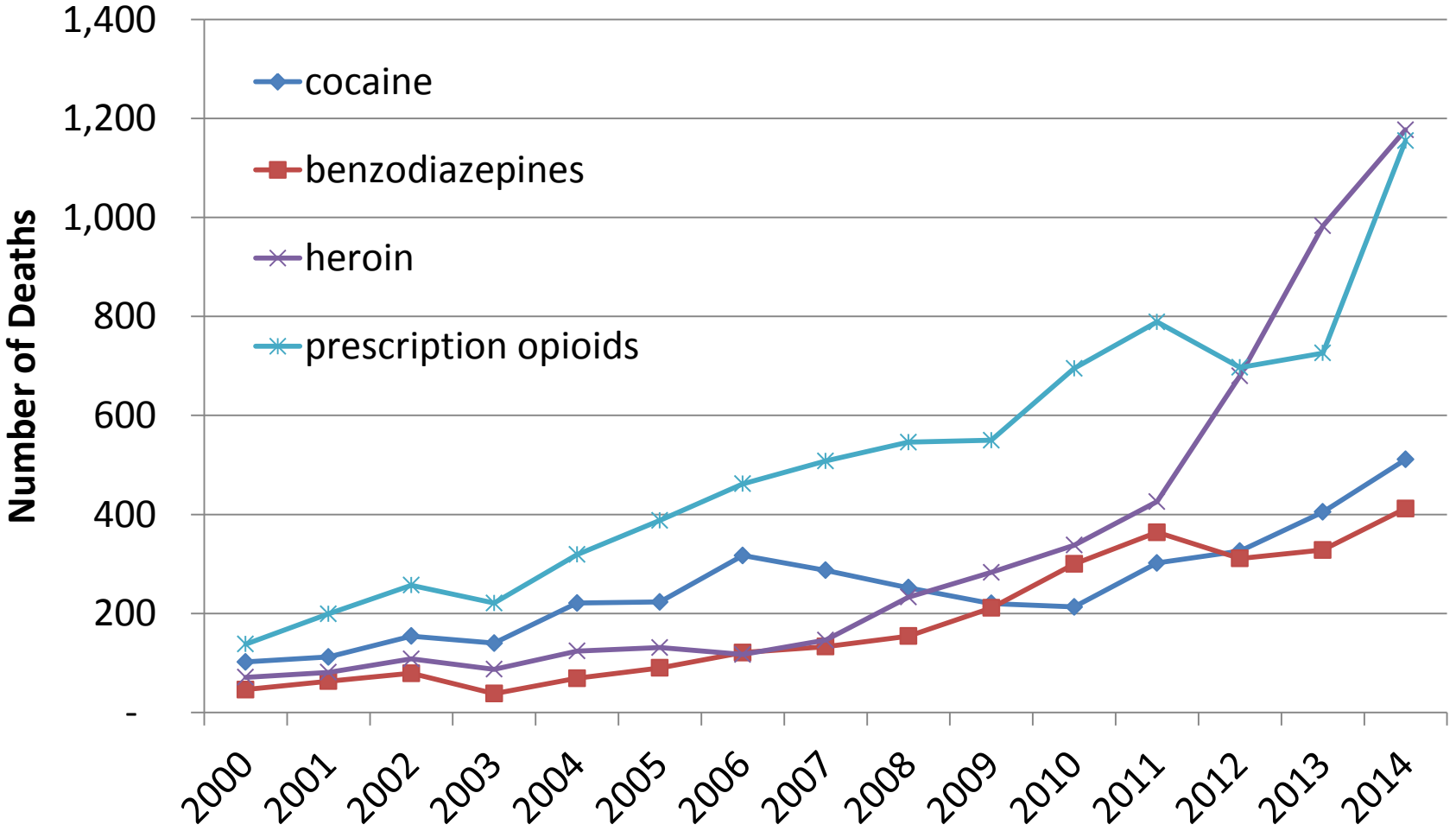
Predictor	AHR	95% CI	*p*-value
PO dependence (lifetime)	2.39	(1.07, 5.48)	.0345
Early age PO Initiaton ≤15	3.08	(1.26, 7.47)	.0139
Has never used PO to self-medicate (only to get high)[1]	4.83	(2.11, 11.0)	.0003
Non-oral PO use (lifetime)	6.57	(2.81. 17.2)	<.0001

100% of heroin initiates used OxyContin, so it could not be included in model.

Conclusions and Limitations

- Study conducted in one Midwest region where the opioid epidemics continue full bore.
- Limited, emerging, adult age range.
- Self-reported data.
- Possible some lost to follow-up transitioned to heroin use as well.
- First prospective study confirming findings from qualitative and retrospective structured research.
- Findings have substantial implications for intervention design.

Unintentional Drug Overdose Deaths of Ohio Residents by Specific Drug(s) Involved, by Year, 2000-2014[1,2]



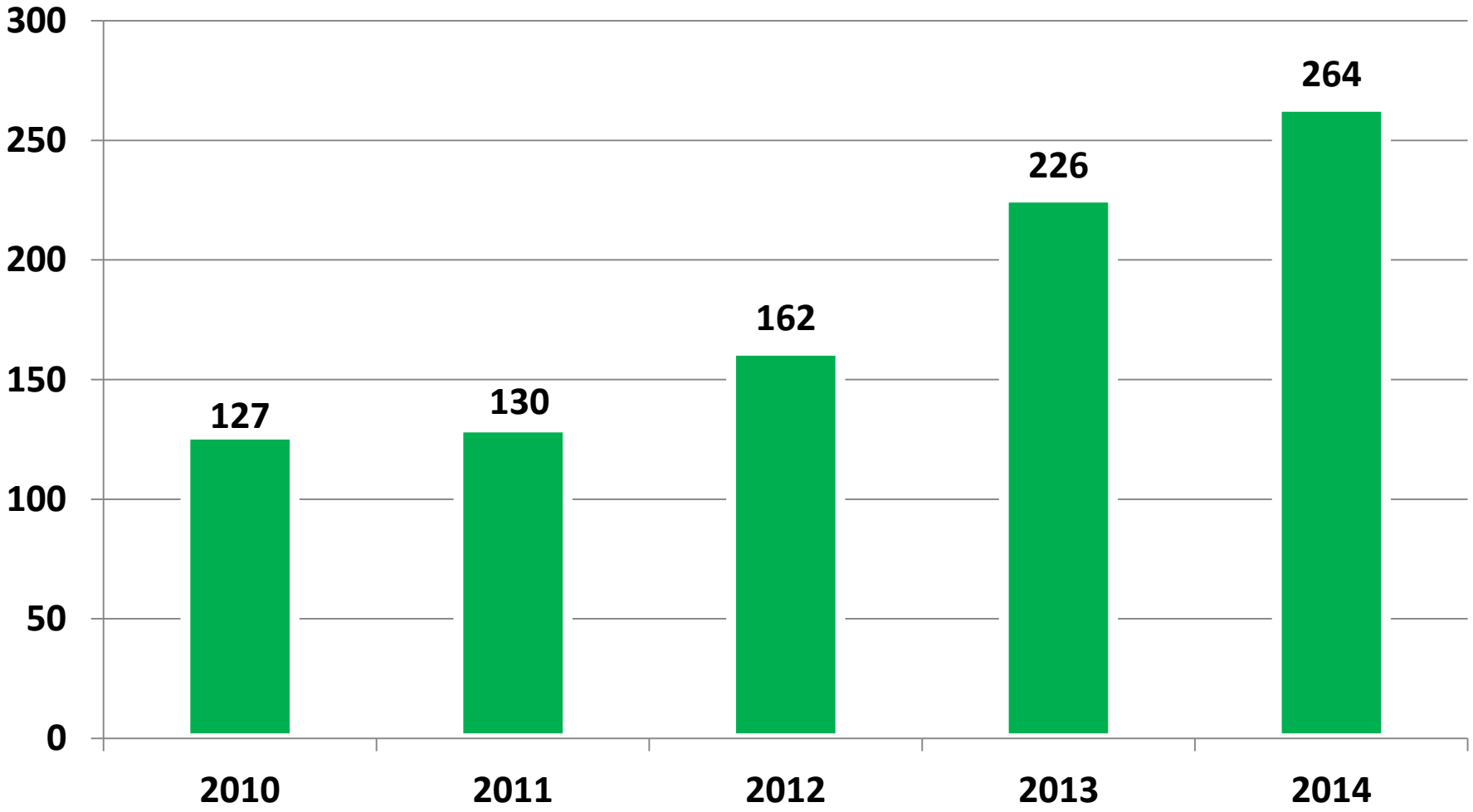
Accidental Drug Overdose Deaths in Montgomery County, Ohio 2010—2014

Center for Interventions, Treatment, and Addictions Research

Public Health—Dayton & Montgomery County

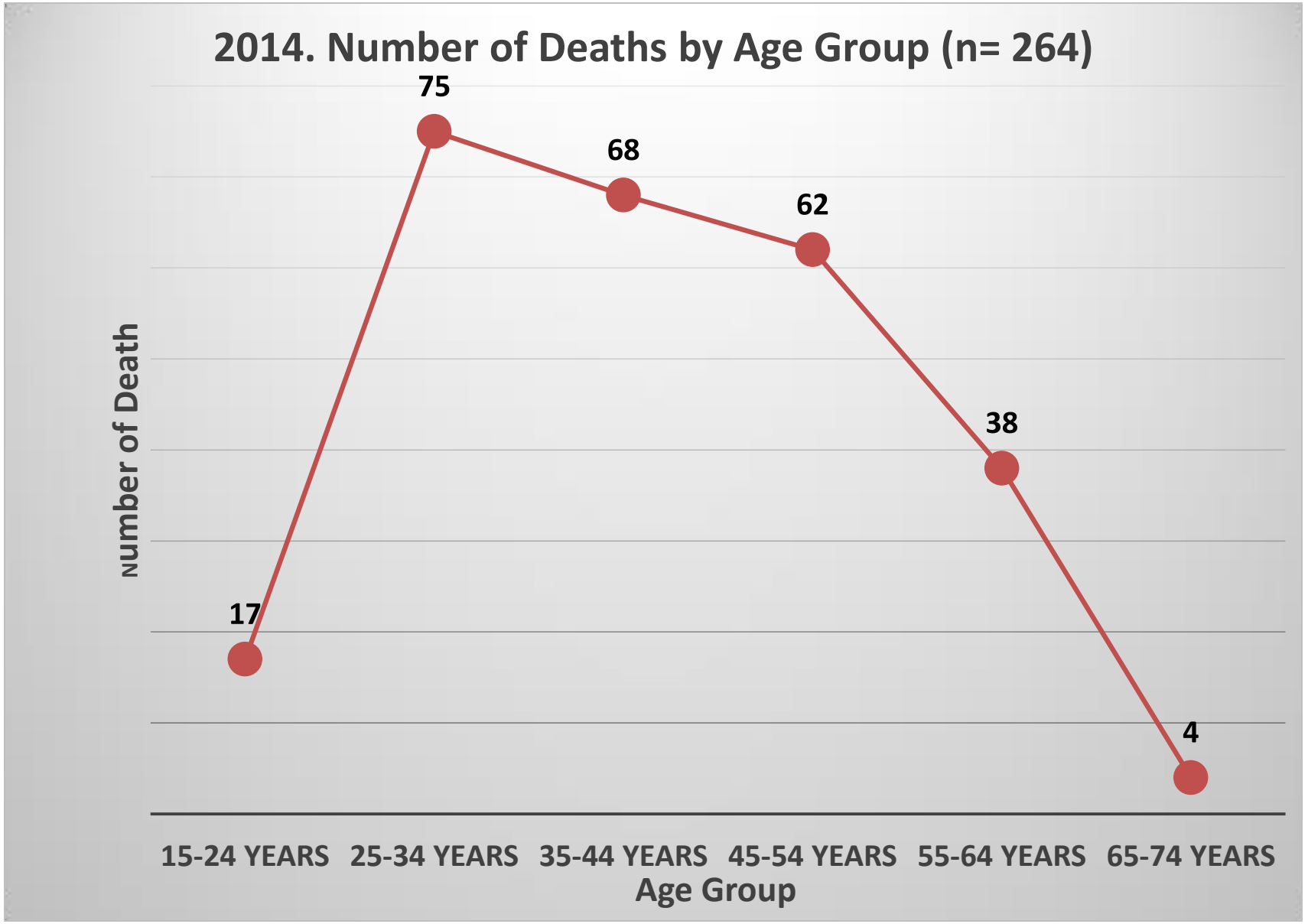
Montgomery County Coroner's Office

Accidental Drug Overdose Deaths in Montgomery County, 2010—2014



Source: Montgomery County Coroner's Office

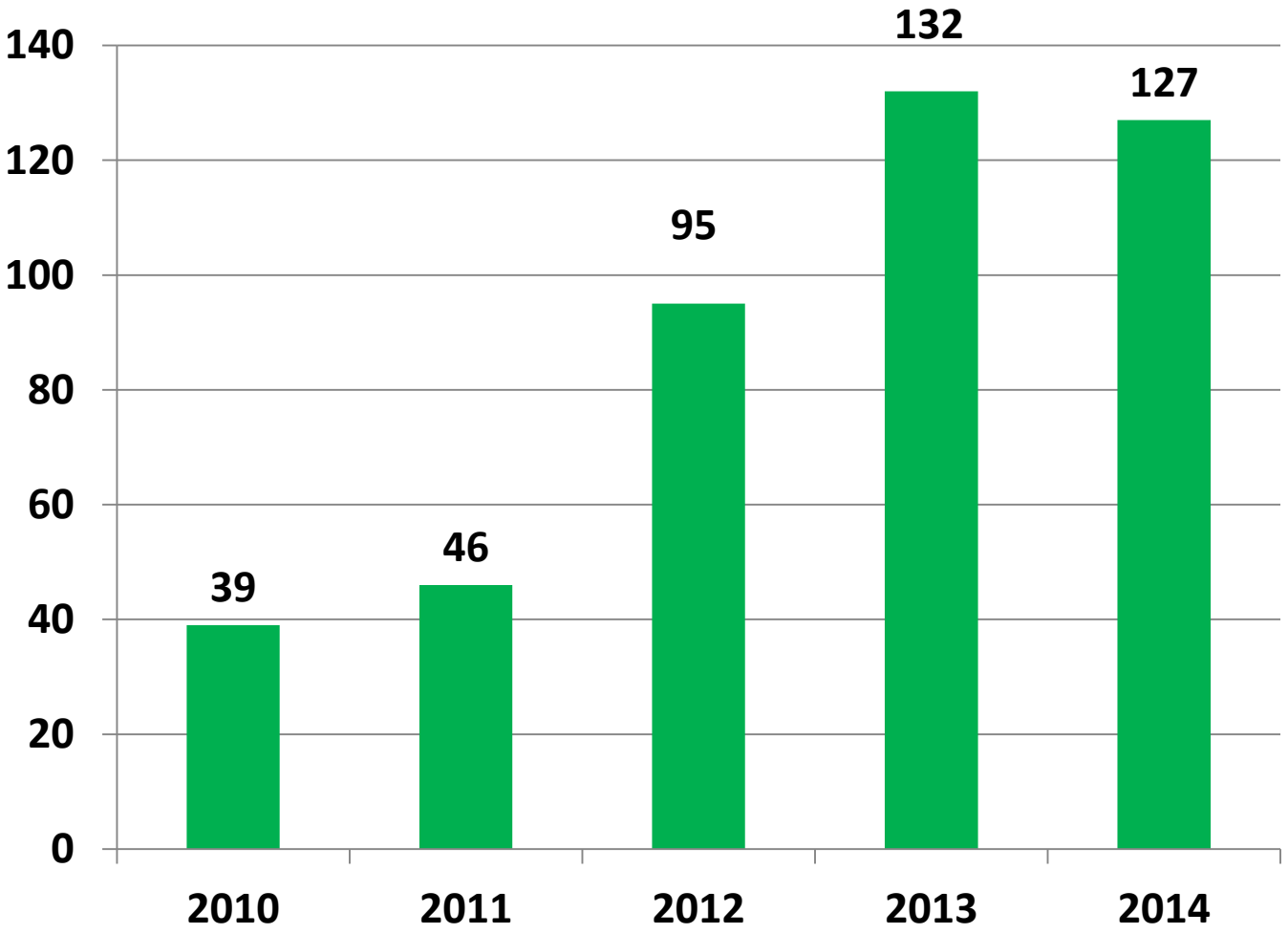
POISONING DEATH REVIEW SUMMARY REPORT, 2014							
[27 not Montgomery County Residents]	Total Cases 2014	264		2013 Cases: 226	2012 Cases: 162	2011 Cases: 130	2010 Cases: 127
DEMOGRAPHICS							
Characteristic							
	Category	**Freq**	**%**	2013	2012	2011	2010
Gender	**Male**	**164**	**62%**	67%	60%	59%	**57%**
	Female	**100**	**38%**	33%	40%	41%	43%
Race	**White**	**234**	**89%**	87%	85%	87%	**90%**
	Black	**29**	**11%**	11%	14%	13%	10%
	Other	**1**	**0%**	2%	1%	0%	0%
Education	**<High School**	**62**	**23%**	29%	27%	28%	20%
	HS graduate	**194**	**74%**	65%	69%	69%	**76%**
	College graduate	**7**	**3%**	4%	2%	2%	2%


2014. Number of Deaths by Age Group (n= 264)
Number of Death
75
68
62
38
17
4
15-24 YEARS
25-34 YEARS
35-44 YEARS
45-54 YEARS
55-64 YEARS
65-74 YEARS
Age Group

TOXICOLOGY REPORT											
	Total Cases 2014	264		2013 Cases: 226		2012 Cases: 162		2011 Cases: 130		2010 Cases: 127	
Characteristic	Category	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Prescription Opioids	Any	98	37%	100	44%	75	46%	81	62%	94	74%
	Oxycodone	28	11%	24	11%	25	15%	25	19%	29	23%
	Hydrocodone	43	16%	22	10%	15	9%	19	15%	31	24%
	Methadone	13	5%	31	14%	20	12%	43	33%	41	32%
	Fentanyl	7	3%	14	6%	9	6%	8	6%	9	7%
	Hydromorphone	4	2%	1	0%	0	0%	0	0%	1	1%
	Morphine	28	11%	16	7%	10	6%	10	8%	11	9%
Benzodiazepines	Any	134	51%	118	52%	70	43%	84	65%	87	69%
Any Prescription Opioid + Any Benzodiazepine		61	23%	67	30%	43	27%	64	49%	73	57%
Any Opiate		245	93%	204	90%	148	90%	114	88%	117	92%

Heroin

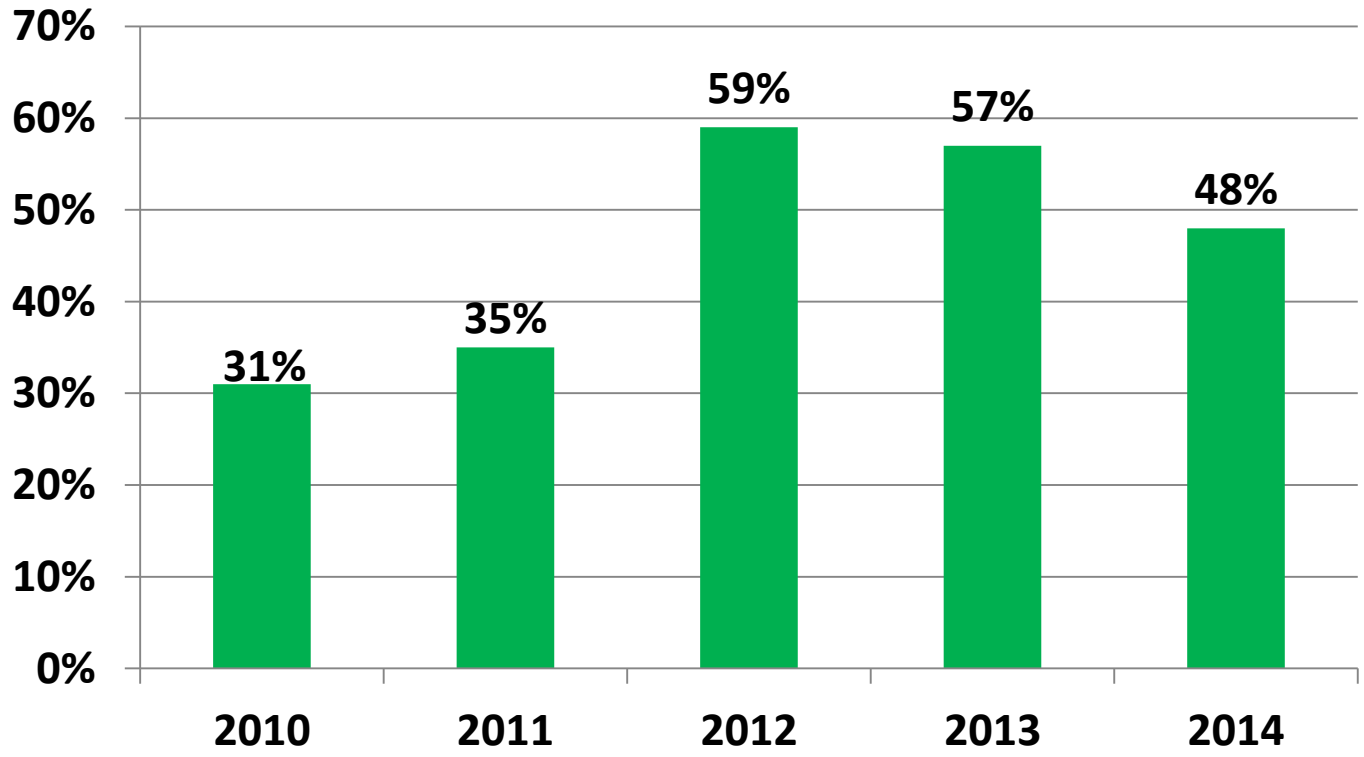
Mentions in Toxicology Reports 2010—2014



Source: Montgomery County Coroner's Office

Heroin

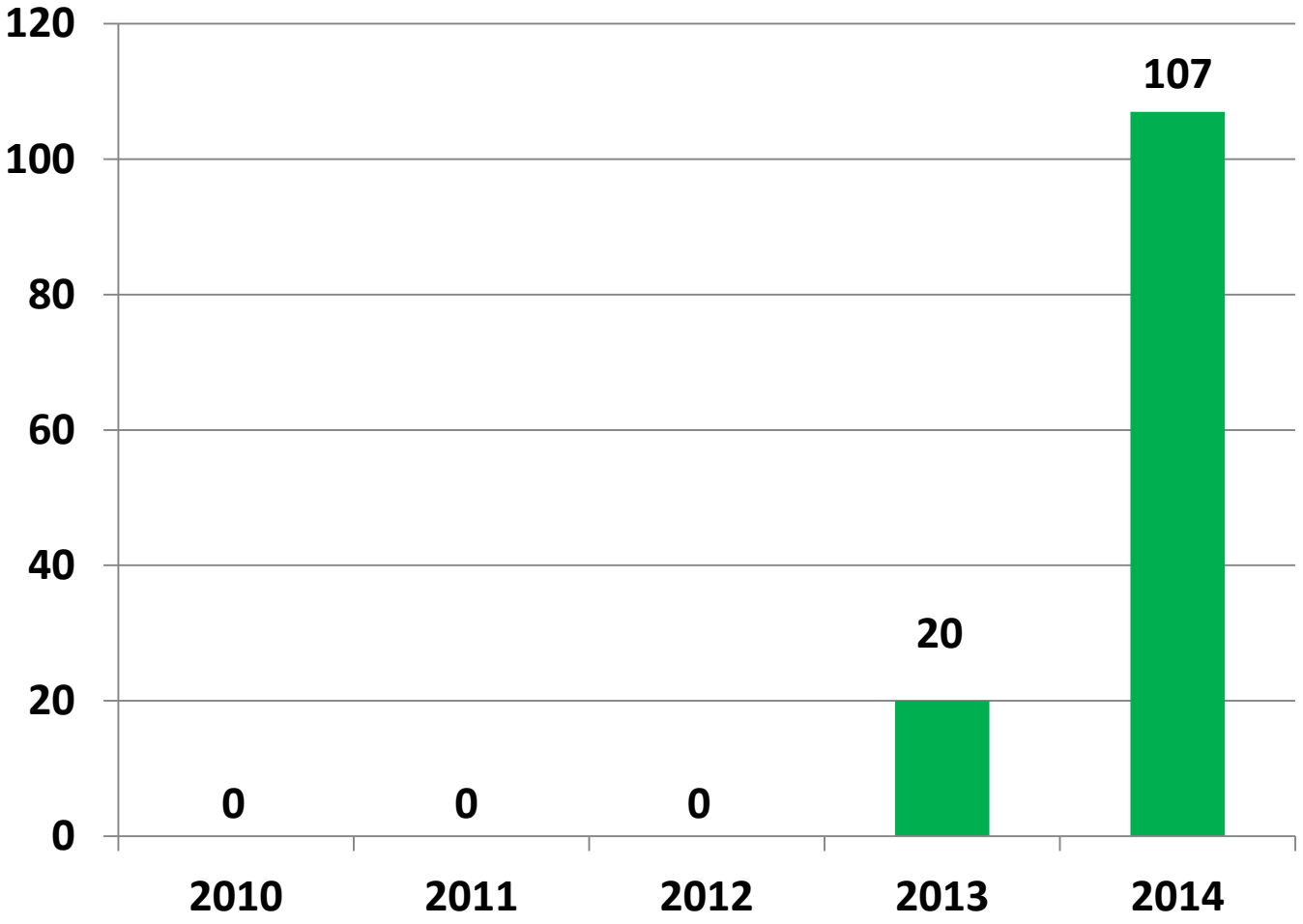
Percent Mentions in Toxicology Reports, 2010-2014



Source: Montgomery County Coroner's Office

Illicit Fentanyl

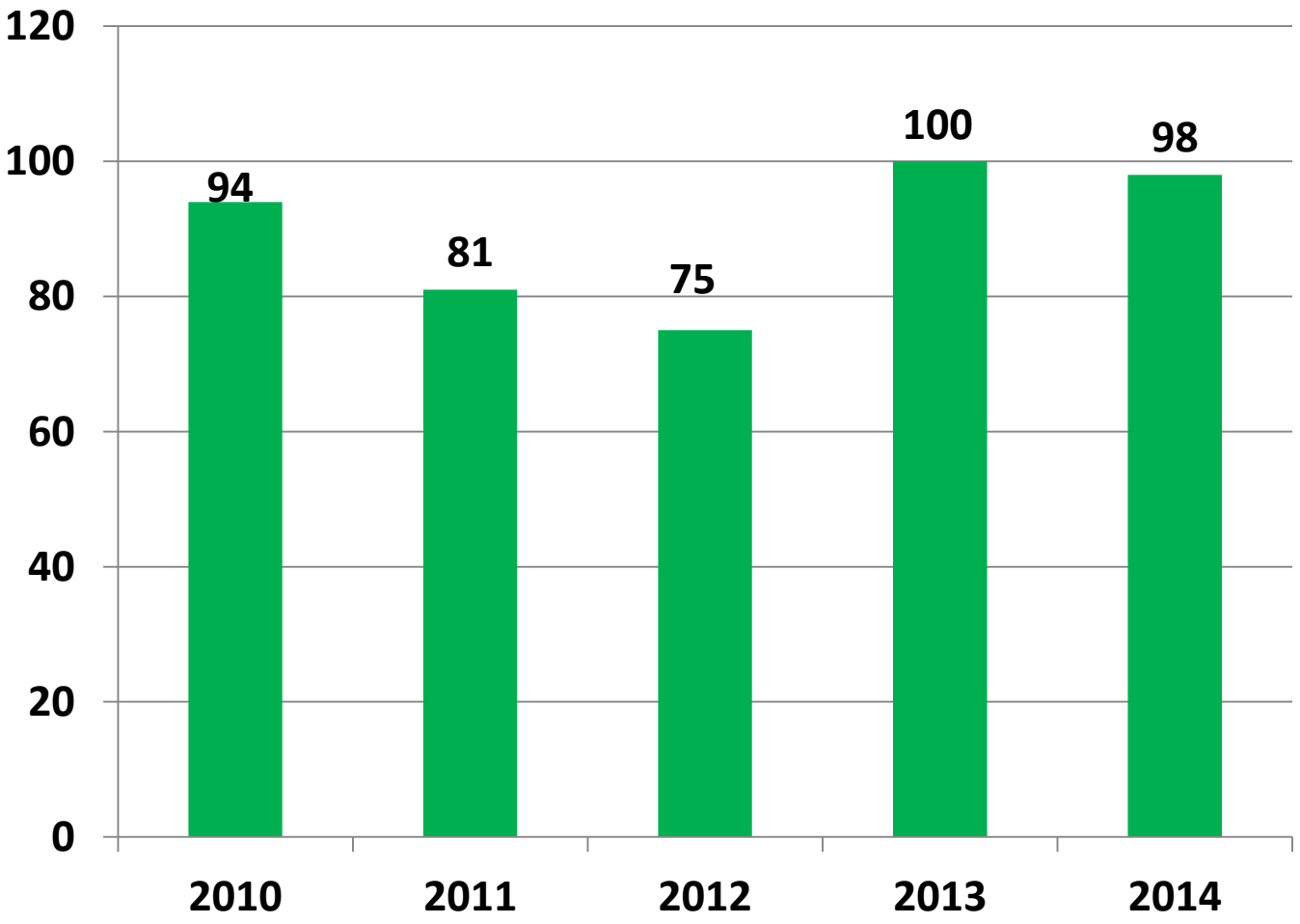
Mentions in Toxicology Reports 2010—2014



Source: Montgomery County Coroner's Office

Prescription Opioids

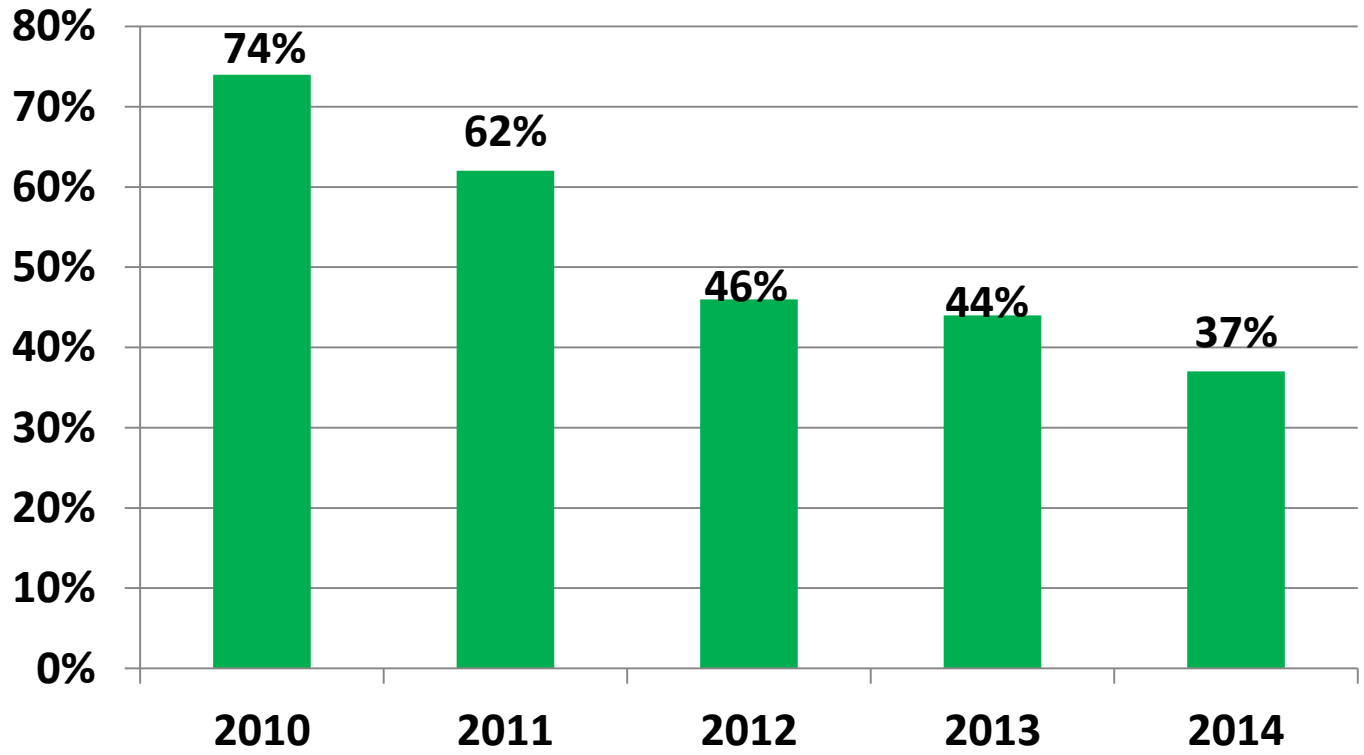
Mentions in Toxicology Reports 2010—2014



Source: Montgomery County Coroner's Office

Prescription Opioids

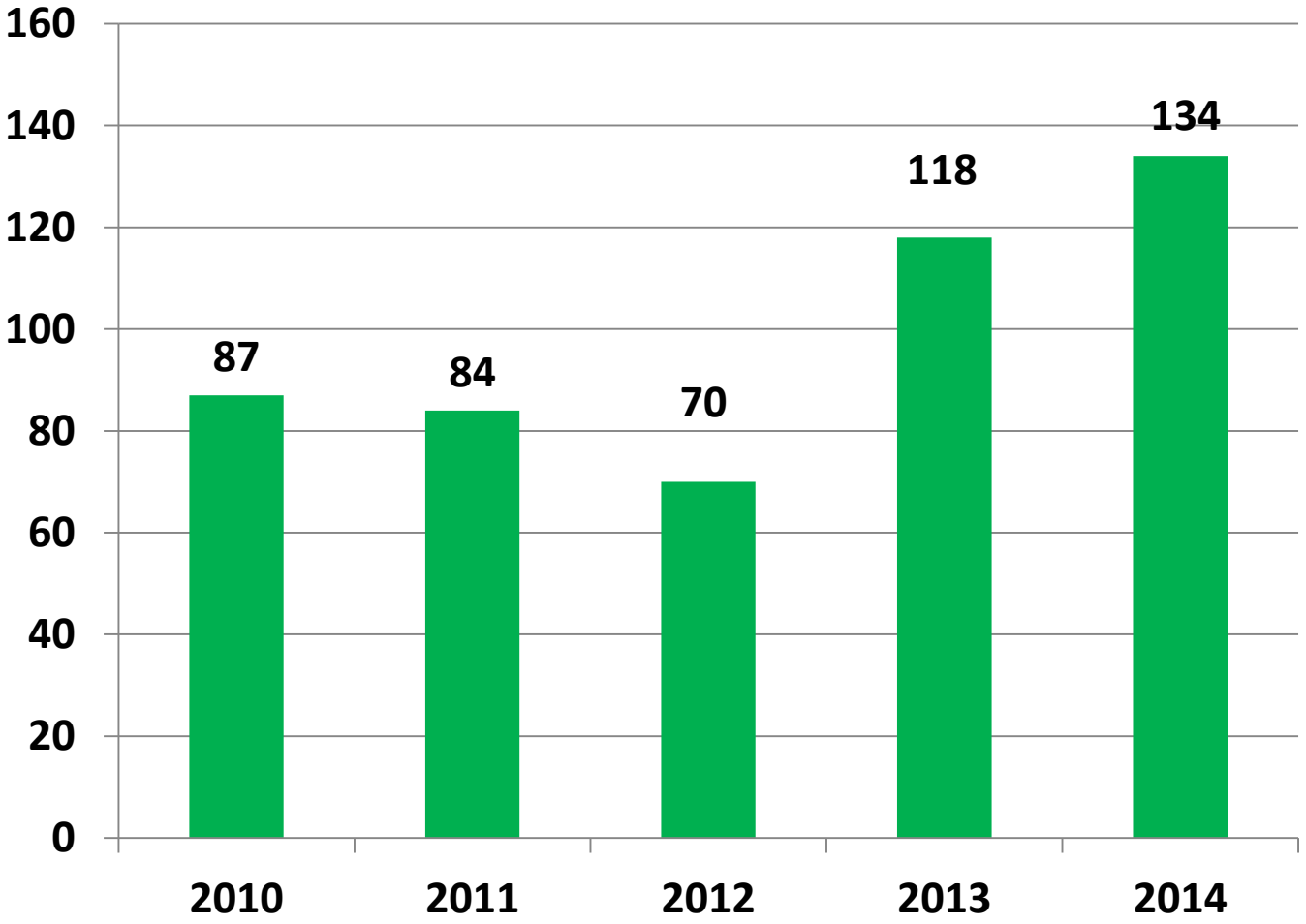
Percent Mentions in Toxicology Reports, 2010-2014



Source: Montgomery County Coroner's Office

Benzodiazepines

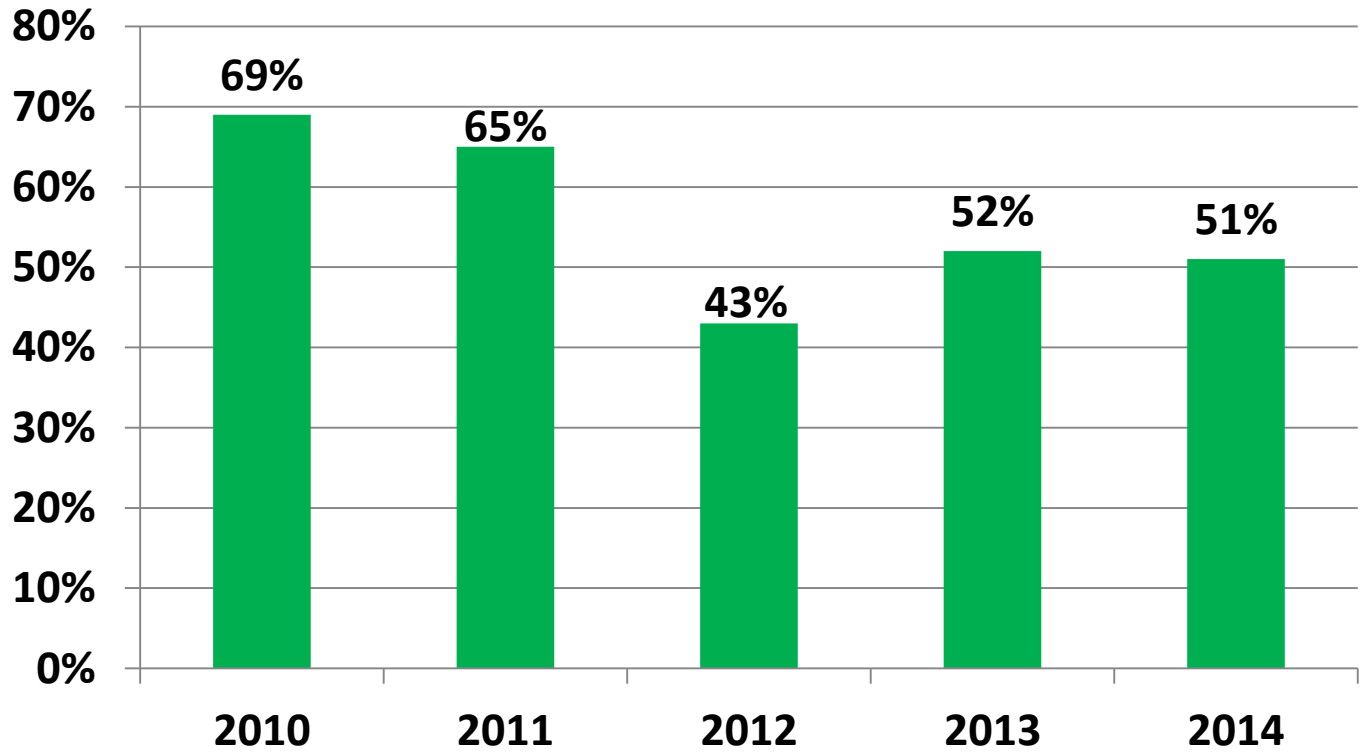
Mentions in Toxicology Reports 2010—2014



Source: Montgomery County Coroner's Office

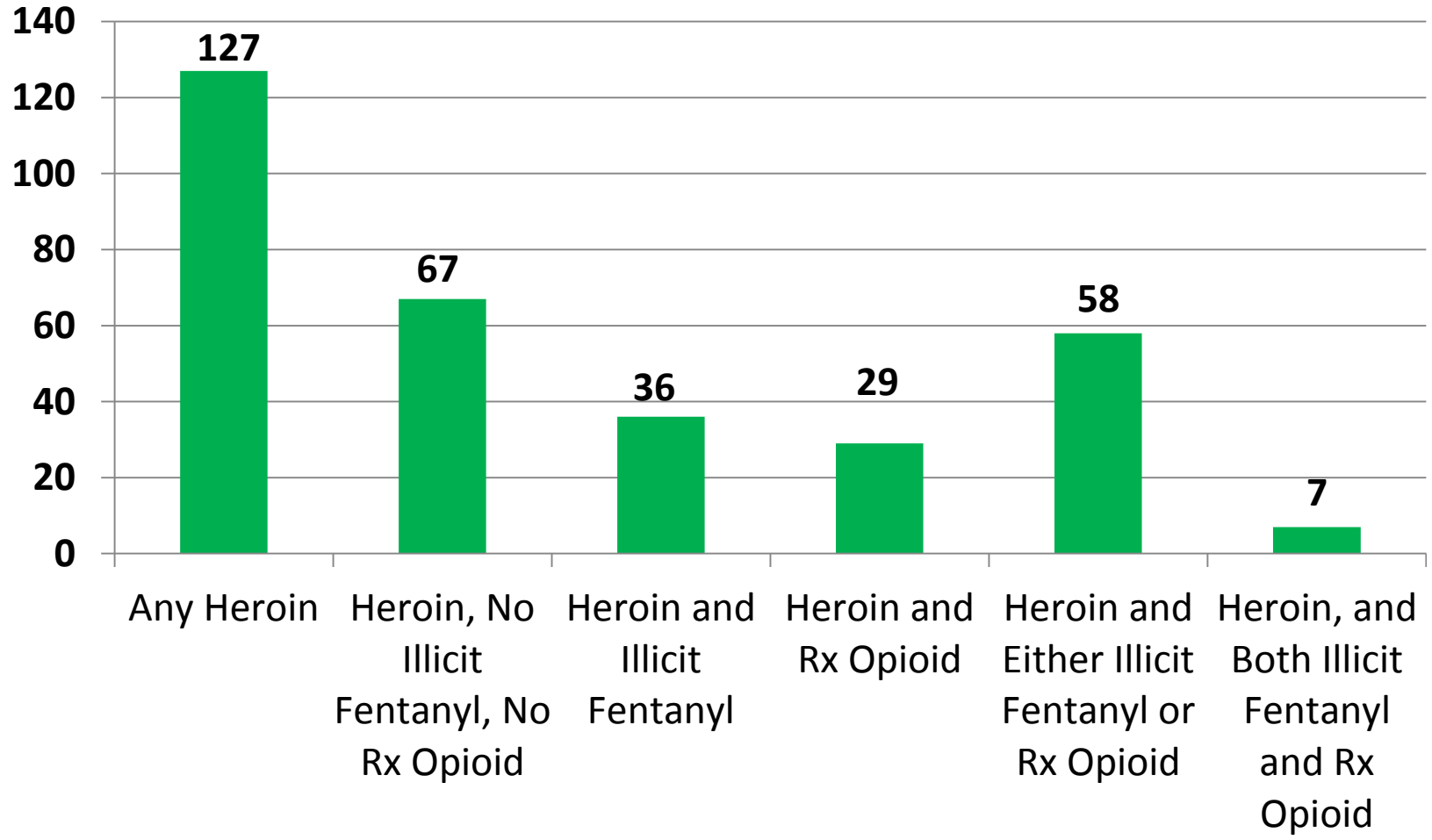
Benzodiazepines

Percent Mentions in Toxicology Reports, 2010-2014



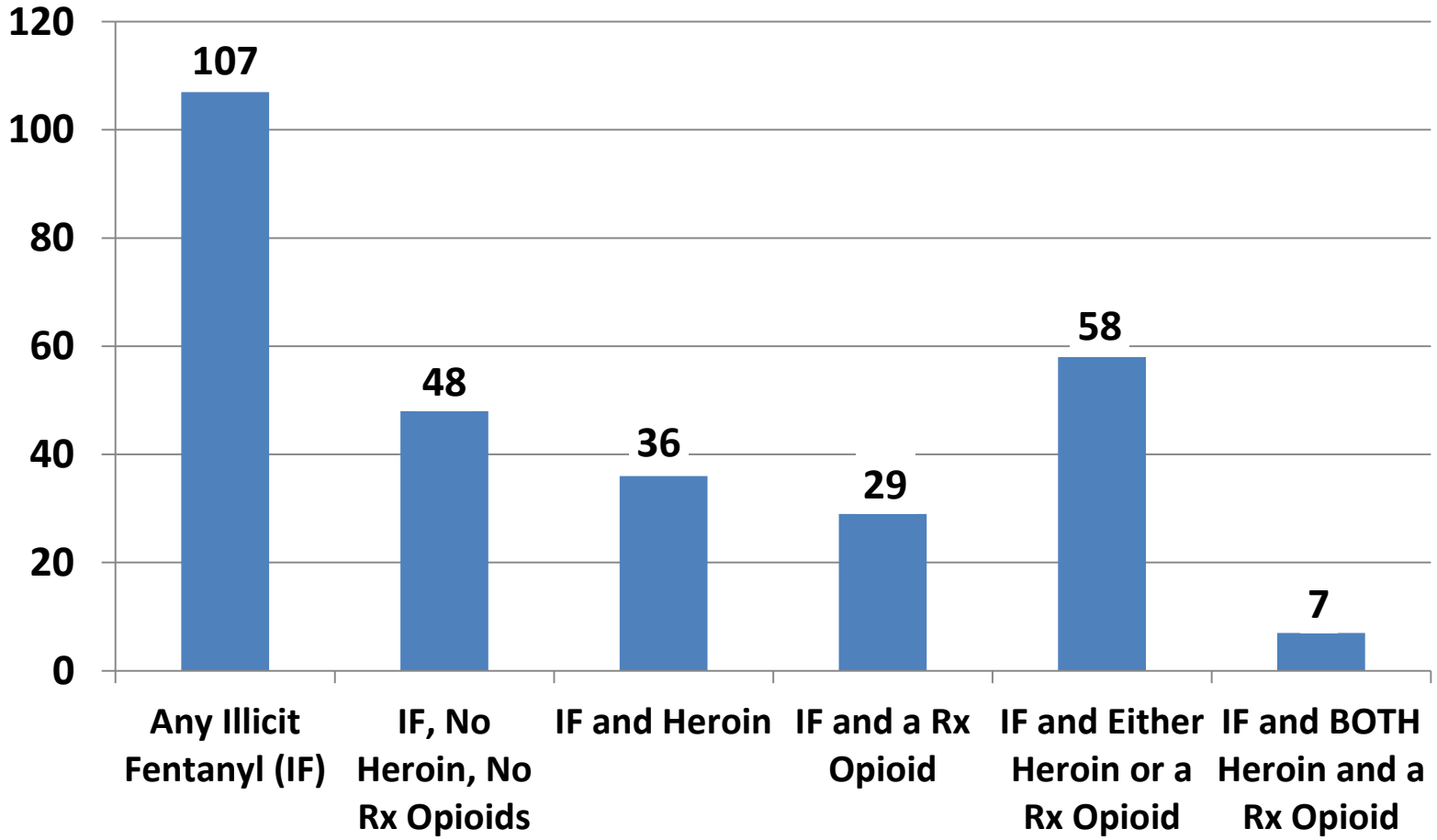
Source: Montgomery County Coroner's Office

Heroin, with Illicit Fentanyl and Prescription Opioids in Toxicology Reports 2014



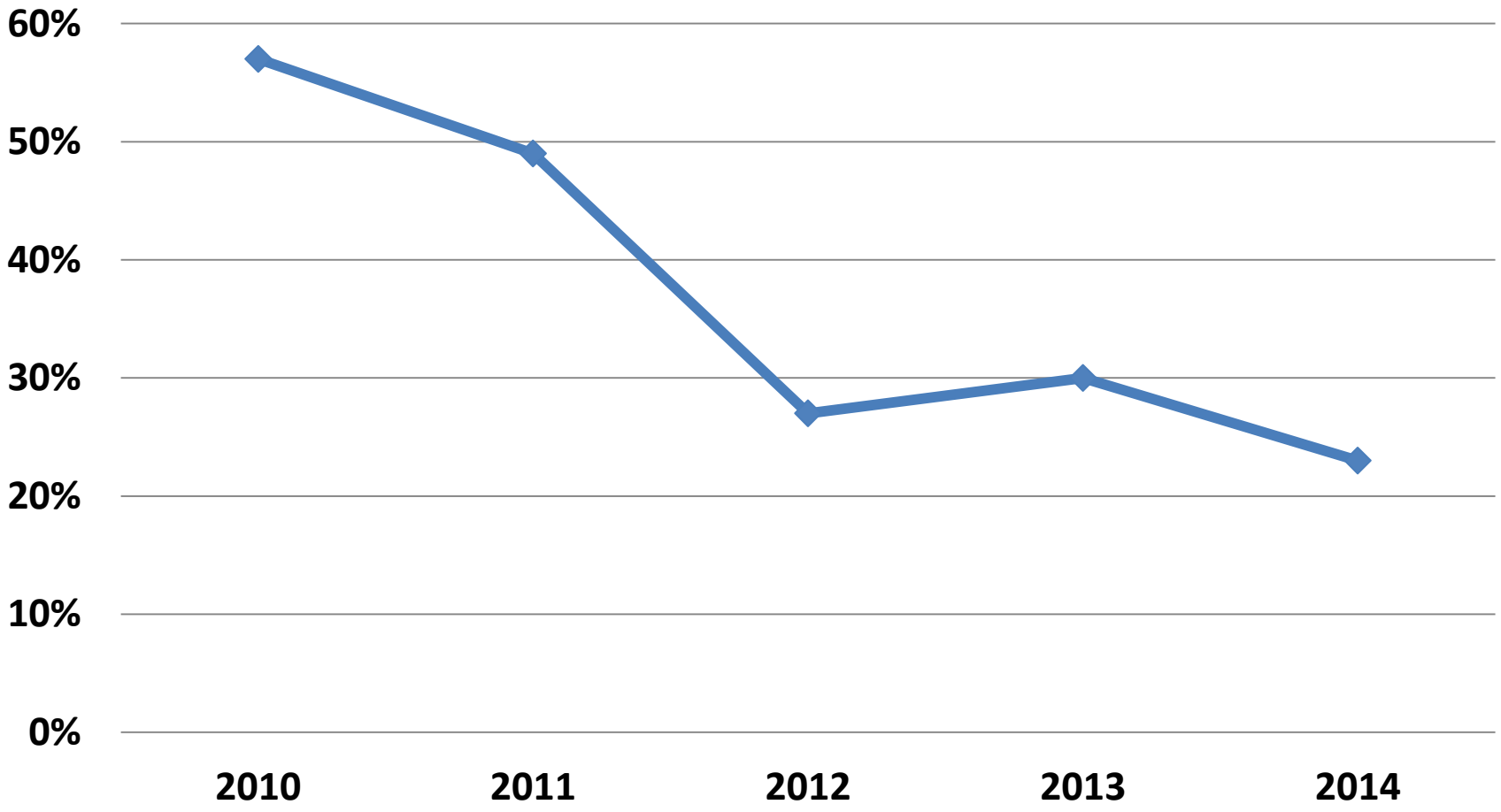
Source: Montgomery County Coroner's Office

Illicit Fentanyl with Heroin and Prescription Opioids in 2014 Toxicology Reports



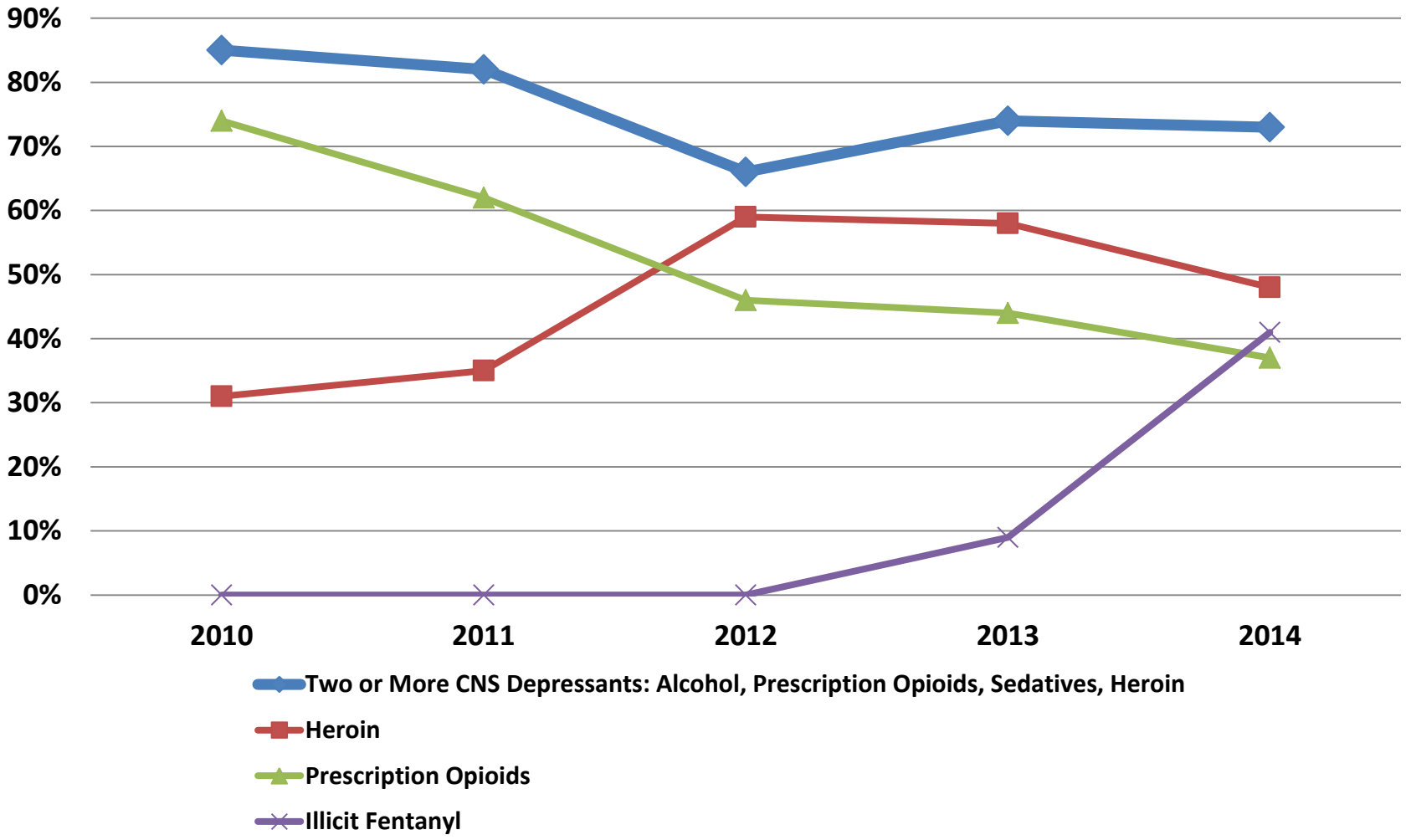
Source: Montgomery County Coroner's Office

Percentage of Cases with Both a Prescription Opioid and a Benzodiazepine



Source: Montgomery County Coroner's Office

More Than One Central Nervous System Depressant



Source: Montgomery County Coroner's Office

The Future?

- Unfortunately no crystal ball.
- There is no indication of a dramatic reversal in the impacts of the opioid epidemics in the near future.
- Change in trends will require a collaborative effort for years.
- Addressing the consequences will take much longer.

Promising comments by the State Attorney General DeWine

- "The problem, which has permeated virtually every single community," is beyond law enforcement or lawmakers. We cannot arrest our way out of this problem."
- "Combatting the state's heroin epidemic will require grassroots efforts on a community level …[and] has to include education, prevention and an effort to change the culture."
- "Mr. DeWine also discussed … another major problem facing the nation and state: the lack of opportunity for certain segments of the population."
- Evoking Robert Putnam's latest book, *Our Kids: The American Dream in* Crisis, [DeWine] said "the lack a chance to achieve the American Dream is the "challenge of society."

Gongwer Ohio. Volume #84, Report #210, Article #4--Friday, October 30, 2015

Thank You!

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http://www.med.wright.edu/citar/osam.html