

Statewide Trends in Out-of-Hospital Cardiac Arrest Related to Drug Overdose

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SAMUEL BEGER DISCLOSURES

- None

CO-AUTHORS & RELEVANT DISCLOSURES

- Gabriella Smith, MD Candidate - No Disclosures
- Vatsal Chikani, MPH - No Disclosures
- Daniel W. Spaite, MD - No Disclosures
- Samuel M. Keim, MD - No Disclosures
- Robyn McDannold - No Disclosures
- Margaret Mullins - No Disclosures
- Bentley J. Bobrow, MD - No Disclosures

INSTITUTIONAL REVIEW BOARD APPROVAL

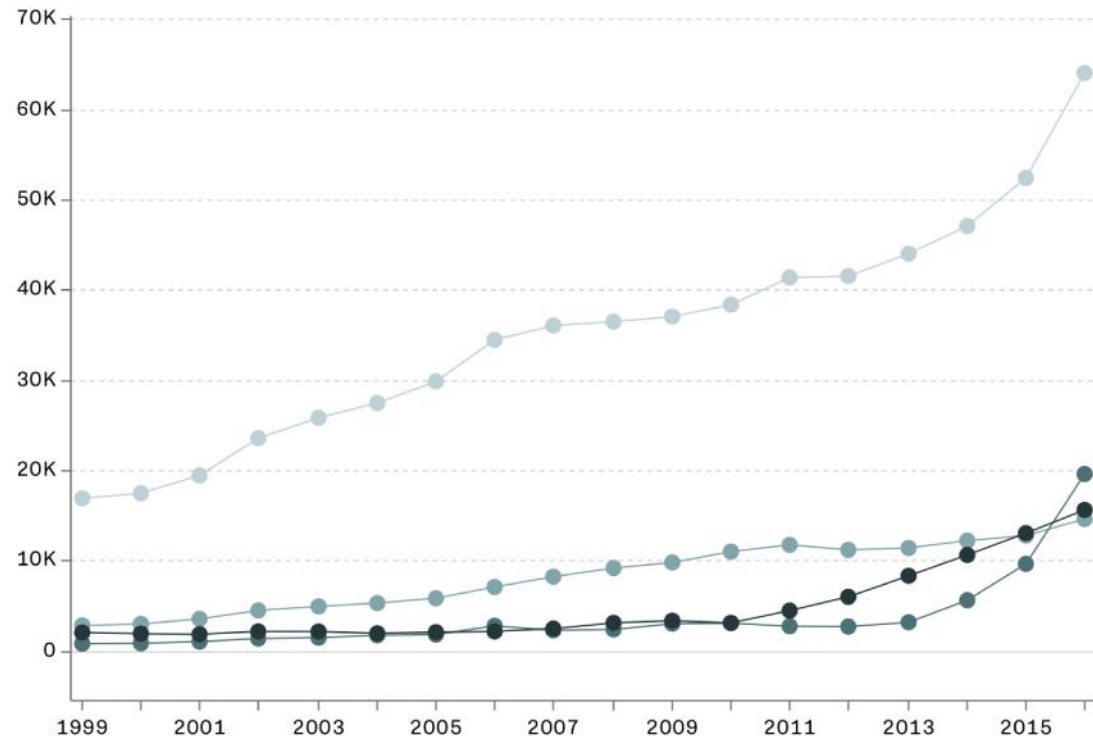
- OHCA has been designated a major public health problem in Arizona.
- Permission to publish the de-identified patient data was obtained from the ADHS HSRB and The University of Arizona IRB.

Drug overdose deaths in America

*The numbers for 2016 are preliminary estimates

**Some deaths on this chart may overlap if they involve multiple drugs

2016	
All drugs	64,026
Fentanyl and other synthetic opioids (minus methadone)	19,547
Heroin	15,564
Opioid painkillers (natural and semisynthetic)	14,550



■ All drugs
 ■ Opioid painkillers (natural and semisynthetic)

■ Fentanyl and other synthetic opioids (minus methadone)
 ■ Heroin

BACKGROUND: OVERDOSE AND OHCA

- High geographic variation in OD-OHCA proportion and incidence, varying up to 5-fold^{1,2,3}
- May be related to differing methodologies (Naloxone administration, hospital determination vs EMS determination, etc.)
- Demographic studies see younger median age, increased survival rates of OD-OHCA victims and lower bystander CPR rates.^{1,2,3}
- There is a paucity of literature after 2013, (As opioid problem has increased).

1. Salcido et al. 2016.
2. Koller et al. Resuscitation 2014
3. Orkin et al. *PLoS One*. 2017.

STUDY AIM

- Assess the latest trends in incidence, process of care, and outcomes of OD-OHCAs compared to presumed cardiac etiology arrests (C-OHCAs) in the state of Arizona.

METHODS

Data Source:

Statewide observational study utilizing a mature Utstein-style database Save Hearts in Arizona Registry & Education (AZ SHARE).

Study Population:

Adults (18 +) - Five Years: January 1st 2010 - December 31st 2015.

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Detailed review of EMS first care reports linked with hospital records/outcomes, and vital statistics data.

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C-OHCA Cohort: Aggregate of non-traumatic/respiratory presumed cardiac etiologies

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Outcome: OD-OHCA incidence and survival to hospital discharge.

Demographics included age, gender, location of arrest and bystander CPR.

Outcomes included survival, initial shockable rhythm.

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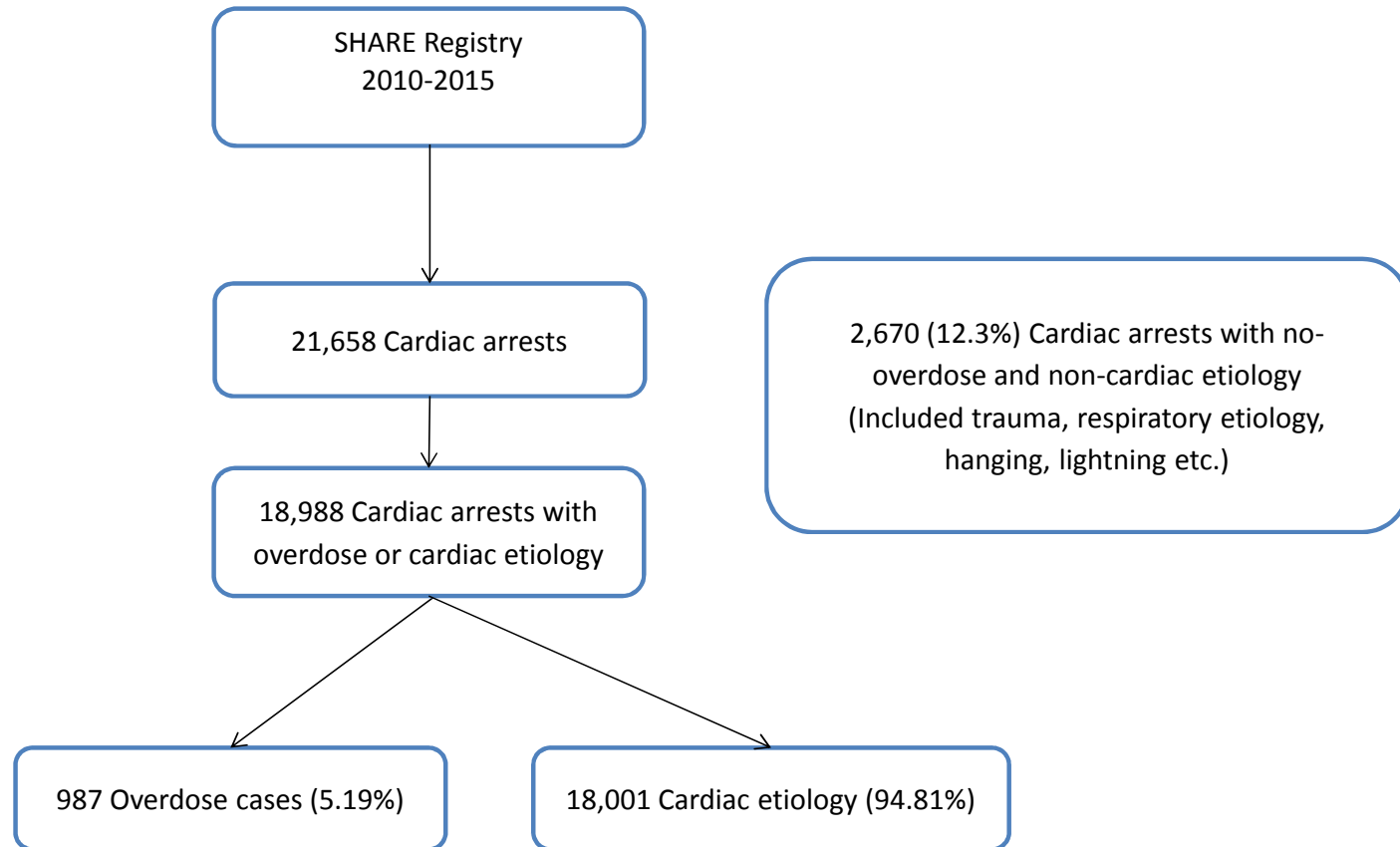
Analysis:

Incidence, outcomes and demographic differences between OD-OHCA and C-OHCA cohorts

STATISTICAL METHODS

- Multivariate logistic regression was carried out to compare survival between the two groups.
- Difference in bystander CPR and survival between the OD-OHCA and C-OHCA were compared using the Chi-square test.
- All of the tests were two-tailed and a p-value of <0.05 was considered statistically significant.
- All statistical analyses were performed using the SAS software package, version 9.4 (SAS Institute, Inc., Cary, USA).

RESULTS: ENROLLMENT



RESULTS



Incident year	Overdose		Cardiac etiology	
	N	% (95% CI)	N	%
Overall	987	5.1%	18,001	94.8%
2010	121	4.6% (3.8-5.4)	2,467	95.3%
2011	131	4.4% (3.7-5.2)	2,823	95.5%
2012	126	4.1% (3.5-4.9)	2,877	95.8%
2013	154	4.6% (3.9-5.3)	3,177	95.3%
2014	212	6.3% (5.5-7.1)	3,145	93.6%
2015	243	6.4% (5.7-7.3)	3,512	93.5%

RESULTS: DEMOGRAPHICS

	Overdose (n=987)	Cardiac etiology (n=18,001)	p-value
Age (Mean, SD)	38.8 yrs (14.6)	64.2 (18.4)	<0.0001*
Gender - Male	63.65 (628)	64.6% (11,630)	0.5157
Shockable rhythm	7.0% (69)	22.6% (4,065)	<0.0001*
Location- residential	65.3% (644)	53.9% (9,707)	<0.0001*
Bystander CPR Performed	49.4% (369)	48.32% (6,800)	0.5231
Missing data	24.3% (240)	21.6% (3,893)	
Survived	18.6% (181)	11.9% (2,097)	<0.0001*
Missing data	1.6% (16)	2.3% (410)	

RESULTS: BYSTANDER CPR

	Overdose		Cardiac etiology	
Survival	Simple OR	Adjusted OR	Simple OR	Adjusted OR
Bystander CPR performed	1.6 (1.1-2.3)	1.6 (1.0-2.4)	1.3 (1.2-1.4)	1.2 (1.0-1.3)

**Adjusted for witnessed arrest, shockable rhythm, gender, age, response time

DISCUSSION

- First statewide study that we are aware of analyzing OD-OHCAs in U.S.
- We found that OD-OHCA victims were younger and more likely to survive than C-OHCA.
- In contrast to previous studies, we found that BCPR rates were nearly identical.
- BCPR appeared to have a significant impact on survival in both groups.

LIMITATIONS

- Missing data was present, MI to minimize risk of bias.
- Do not know for sure exact cause of death.
- The structure of the AZ-SHARE prevents identification of exact drug implicated in the OD.
- Because of local variability, these findings may be different in other regions.

CONCLUSIONS

- This statewide study found a significant increase in the proportion of OD-OHCAs over time as well as differences in population demographics and epidemiology.
- Bystander CPR was associated with survival for both OD-OHCA and C-OHCA.
- Tracking local OD-OHCAs may provide opportunities for prevention strategies and guide resuscitation efforts.

We are grateful for the Arizona EMS system
for their dedication and excellence.

