

Ethnicity, Marital Status, and Neighborhood Poverty Influence Resuscitation of Out-of-Hospital Sudden Unexpected Deaths

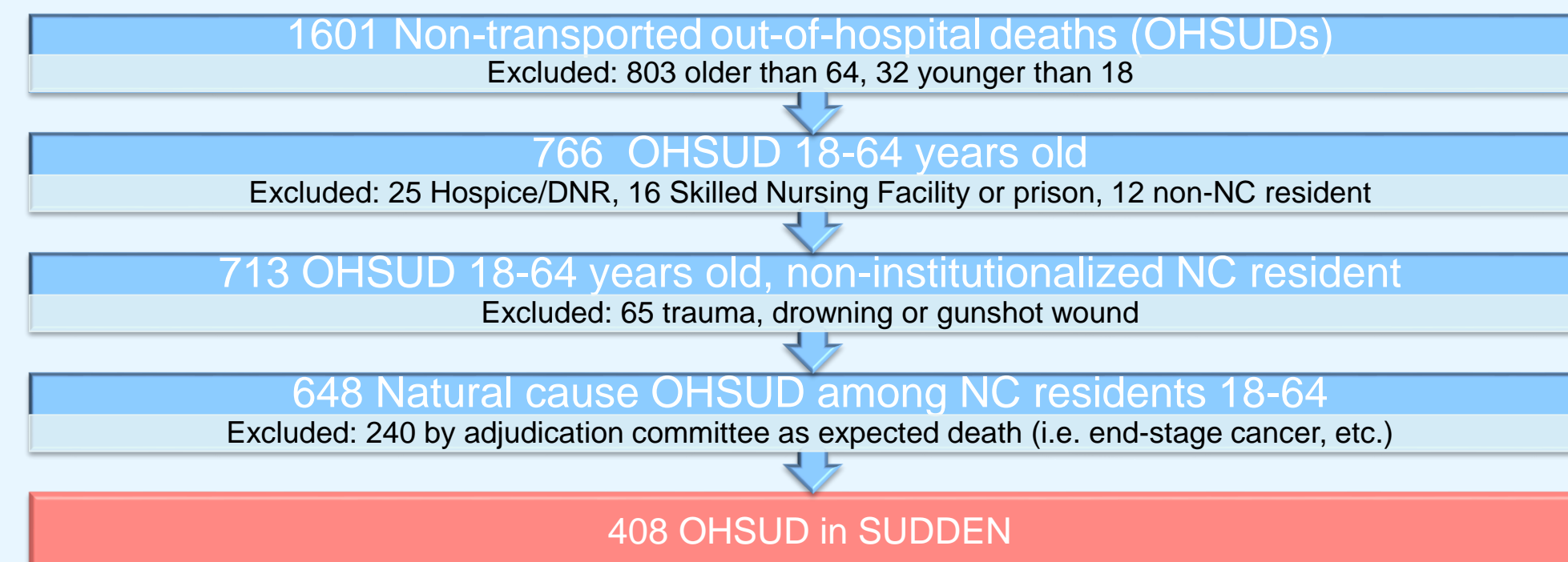
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Background

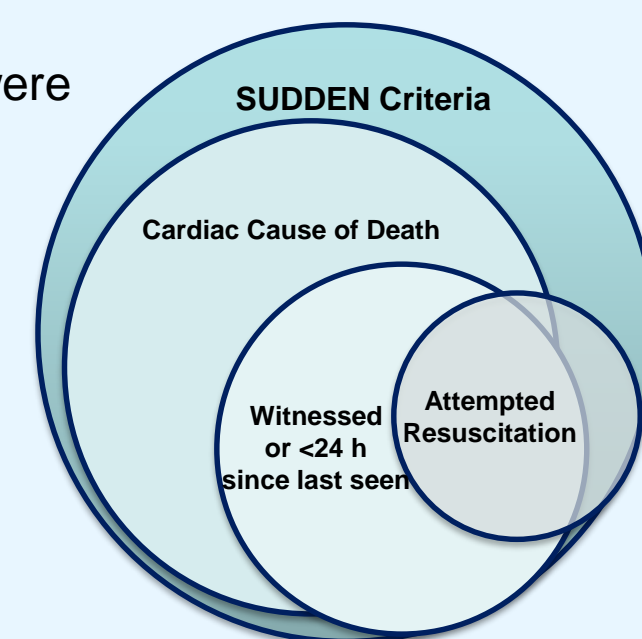
- Out-of-hospital cardiac arrest outcomes vary across communities.
- While these outcomes are known to be largely dependent on initiation of cardiopulmonary resuscitation (CPR), the effect of individual and neighborhood socioeconomic characteristics on CPR initiation is less clear.
- The Sudden Unexpected Death in North Carolina (SUDDEN) study aims to clarify risk factors and characteristics of out-of-hospital sudden unexpected death (OHSUD) victims.
- Distinct from other definitions of sudden unexpected death (WHO, Oregon SUDS), SUDDEN aims to capture all sudden unexpected deaths, regardless of last time seen normal.
- Our population based registry of OHSUD victims captures a diverse group of victims that may be excluded from other registries.
- We examined the association between socioeconomic characteristics and the initiation of CPR in the SUDDEN cohort.

Methods

- From 2013-2015, all EMS attended out-of-hospital deaths in Wake County, NC (population 974,289) were screened.
- North Carolina residents age 18-64 were included in this study.
- Expected or traumatic deaths or survival to hospital were excluded.
- A committee of three board certified cardiologists adjudicated each case to be included in this study.



- Individual level data, including gender, race, age, occupational status, years of education, and co-existing medical conditions were collected from death certificates, Emergency Medical Services (EMS) referrals, and medical records. Initiation of CPR was determined by EMS records.
- Census tract data, including neighborhood poverty and overcrowding, were determined using home address.
- Poverty area was defined as tracts with > 20% population below the poverty line.
- Overcrowding was defined as tracts with > 5.7% overcrowding.
- Univariate and multivariate regression was performed.



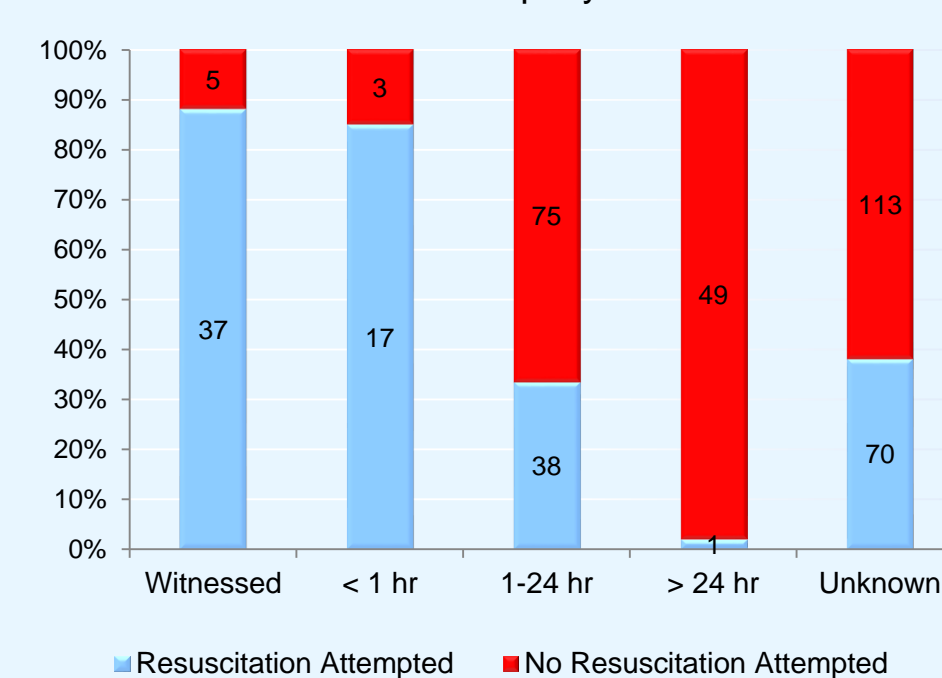
Results

- We adjudicated 408 OHSUD cases between 18-64 years old, representing 14% of all deaths in this age range.

Table 1: Demographic Characteristics of OHSUD Victims

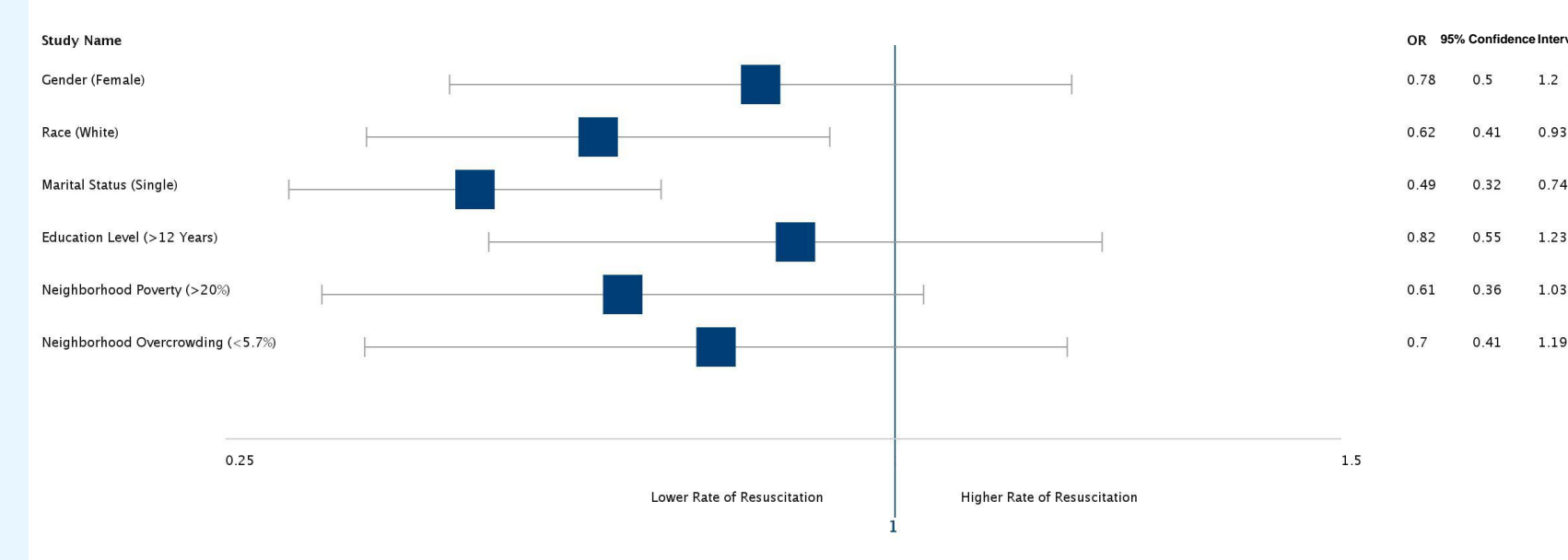
| | Total n (%) | Women n (%) | Men n (%) |
|-----------------------------|-------------|-------------|------------|
| Sex | 408 (100.0) | 127 (31.1) | 281 (68.9) |
| Age (mean [SD]) | 54.3 (8.6) | 54.2 (8.5) | 54.3 (8.6) |
| 18-44 years | 76 (18.6) | 21 (16.5) | 55 (19.6) |
| 45-64 years | 332 (81.4) | 106 (83.5) | 226 (80.4) |
| White | 241 (59.1) | 73 (57.5) | 168 (59.8) |
| Medical History | | | |
| Coronary artery disease | 103 (25.2) | 28 (22.0) | 75 (26.7) |
| Diabetes | 108 (26.5) | 38 (29.9) | 70 (24.9) |
| Dyslipidemia | 151 (37.0) | 47 (37.0) | 104 (37.0) |
| Hypertension | 226 (55.4) | 76 (59.8) | 150 (53.4) |
| Smoking | 174 (42.6) | 49 (38.6) | 125 (44.5) |
| Stroke | 28 (6.9) | 9 (7.1) | 19 (6.8) |
| Chronic kidney disease | 45 (11.0) | 11 (8.7) | 34 (12.1) |
| Chronic respiratory disease | 129 (31.6) | 49 (38.6) | 80 (28.5) |

Chart 1: Resuscitation Attempt by Time Last Seen



- CPR was attempted in 159 victims (39%)
- Whites (OR: 0.61, 95% CI 0.4-0.92) and non-married victims (OR: 0.48, 95% CI 0.32-0.73) were less likely to receive CPR.
- Although not significant, women, higher education, residence in areas with high poverty, and less overcrowding received CPR less frequently.

Table 2: Relative Rate of Resuscitation



- In multivariate analysis, being white (OR: 0.58, 95% CI 0.37-0.91), not married (OR: 0.53, 95% CI 0.35-0.82) and living in a poor neighborhood (OR: 0.52, 95% CI 0.29-0.91) were associated with no CPR attempted.

Table 3: Multivariate analysis results for rate of attempted resuscitation

| | Odds Ratio | Lower 95% Confidence Interval | Upper 95% Confidence Interval |
|-----------------------------|------------|-------------------------------|-------------------------------|
| Race (White) | 0.587 | 0.377 | 0.913 |
| Marital Status (Unmarried) | 0.537 | 0.351 | 0.823 |
| Neighborhood Poverty (>20%) | 0.521 | 0.298 | 0.912 |

Conclusions

- Socioeconomic characteristics are associated with resuscitation attempts in out-of-hospital sudden unexpected death.
- Resuscitation attempts are influenced by delayed identification of cardiac arrest.
- Socioeconomic characteristics such as marital status, race, and living in a poor neighborhood likely impact time to identification of cardiac arrest.

Implications

- Socioeconomic characteristics need to be recognized and accommodated for in community outreach programs to improve cardiac resuscitation efforts.

Limitations

- No adjustments were made to our data for co-morbid medical conditions or missing data.
- Though our data finds an association between socioeconomic characteristics and attempted resuscitation, causality cannot be inferred.

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Disclosures:
 Primary Author Brian Simpson, MD: Nothing to Disclose
 Lead Investigator Ross J Simpson Jr., MD, PhD, FACC:
 CONSULTANT FEES/HONORARIA - Liposience, Merck, Pfizer;
 SALARY - Carolina Center for Medical Excellence

