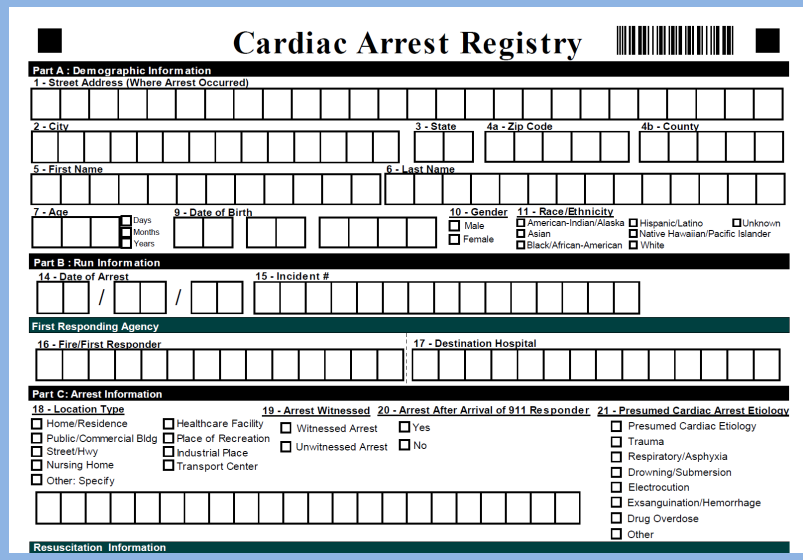
2018 EMS STATE OF THE SCIENCE

Gathering of Eagles

Registry-ing the Buckeyes

Instituting a Statewide CARES Program



Cardiac Arrest Registry

Part A : Demographic Information

1 - Street Address (Where Arrest Occurred)

2 - City | 3 - State | 4a - Zip Code | 4b - County

5 - First Name | 6 - Last Name

7 - Age (Days / Months / Years) | 9 - Date of Birth | 10 - Gender (Male / Female) | 11 - Race/Ethnicity (American-Indian/Alaska / Asian / Black/African-American / Hispanic/Latino / Native Hawaiian/Pacific Islander / White / Unknown)

Part B : Run Information

14 - Date of Arrest (/ /) | 15 - Incident #

First Responding Agency

16 - Fire/First Responder | 17 - Destination Hospital

Part C: Arrest Information

18 - Location Type: Home/Residence; Public/Commercial Bldg; Street/Hwy; Nursing Home; Other: Specify; Healthcare Facility; Place of Recreation; Industrial Place; Transport Center

19 - Arrest Witnessed: Witnessed Arrest; Unwitnessed Arrest

20 - Arrest After Arrival of 911 Responder: Yes; No

21 - Presumed Cardiac Arrest Etiology: Presumed Cardiac Etiology; Trauma; Respiratory/Asphyxia; Drowning/Submersion; Electrocution; Exsanguination/Hemorrhage; Drug Overdose; Other

Resuscitation Information

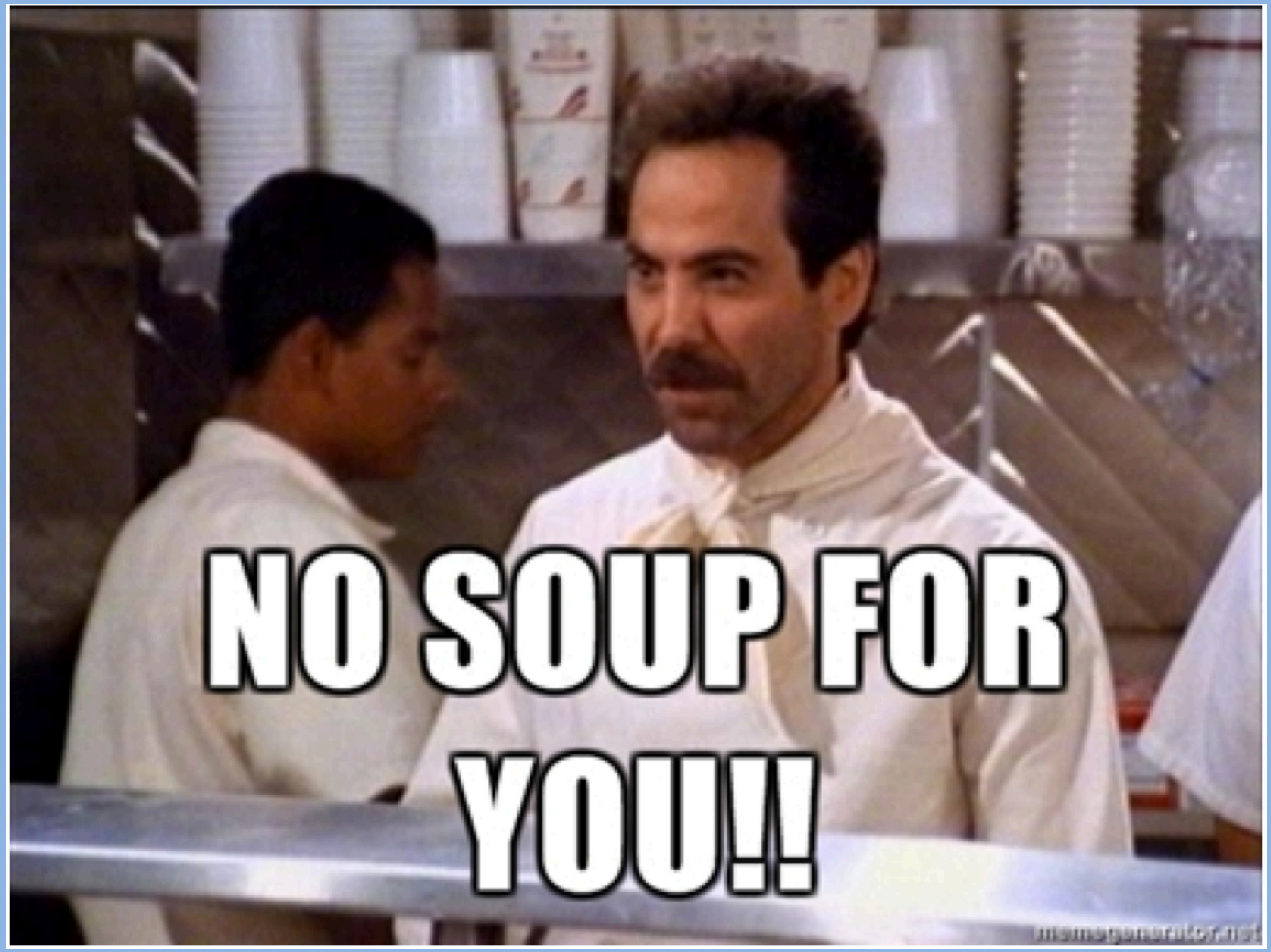
THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER

Dr. David P. Keseg M.D. FACEP

Medical Director Columbus Division of Fire

Adjunct Professor Ohio State University Wexner Medical Center

Disclosures



What are the challenges in establishing a state wide CARES program and what are some of the benefits?

Why collect OHCA data?

You can't manage what you don't measure!

"Most cities don't measure their performance effectively, if at all. They don't know how many lives they are losing, so they can't determine ways to increase survival rates."

- Bob Davis, "Six Minutes to Live" *USA Today*, 2005

Quality Improvement Elements of a Resuscitation System

Developing a culture of high quality resuscitation.
Travers AH, et al. (2010) Circulation;122:S676-S684

Measurement

Benchmark

Feedback & Change

IOM Recommendations

Establish a National Cardiac Arrest Registry

Foster a Culture of Action Through Public Awareness and Training

Enhance the Capabilities and Performance of Emergency Medical Services (EMS) Systems

Set National Accreditation Standards Related to Cardiac Arrest for Hospitals and Health Care Systems

Adopt Continuous Quality Improvement Programs

Accelerate Research on Pathophysiology, New Therapies, and Translation of Science for Cardiac Arrest

Accelerate Research on the Evaluation and Adoption of Cardiac Arrest Therapies

Create a National Cardiac Arrest Collaborative

What is CARES?

Cardiac Arrest Registry to Enhance Survival

CARES Mission Statement

To help communities determine standardized outcome measures for out-of-hospital cardiac arrest allowing for quality improvement efforts and benchmarking capability to improve care and increase survival.

CARES "Beginnings"

Need for a registry

- Original idea "sparked" from AED placement in the community
- Began in Atlanta with Grady EMS
- Slowly expanded nationally and then internationally with PAROS


Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION

American Heart Association.
Learn and Live.

Essential Features of Designating Out-of-Hospital Cardiac Arrest as a Reportable Event: A Scientific Statement From the American Heart Association Emergency Cardiovascular Care Committee; Council on Cardiopulmonary, Perioperative, and Critical Care; Council on Cardiovascular Nursing; Council on Clinical Cardiology; and Quality of Care and Outcomes Research Interdisciplinary Working Group

Graham Nichol, John Rumsfeld, Brian Eigel, Benjamin S. Abella, Darwin Labarthe, Yuling Hong, Robert E. O'Connor, Vincent N. Mosesso, Robert A. Berg, Barbara "Bobbi" Leeper and Myron L. Weisfeldt

Circulation 2008;117:2299-2308; originally published online Apr 14, 2008;
DOI: 10.1161/CIRCULATIONAHA.107.189472

Circulation is published by the American Heart Association. 7272 Greenville Avenue, Dallas, TX 72514

 Print ISSN: 0009-7322. Online ISSN: 1524-4539

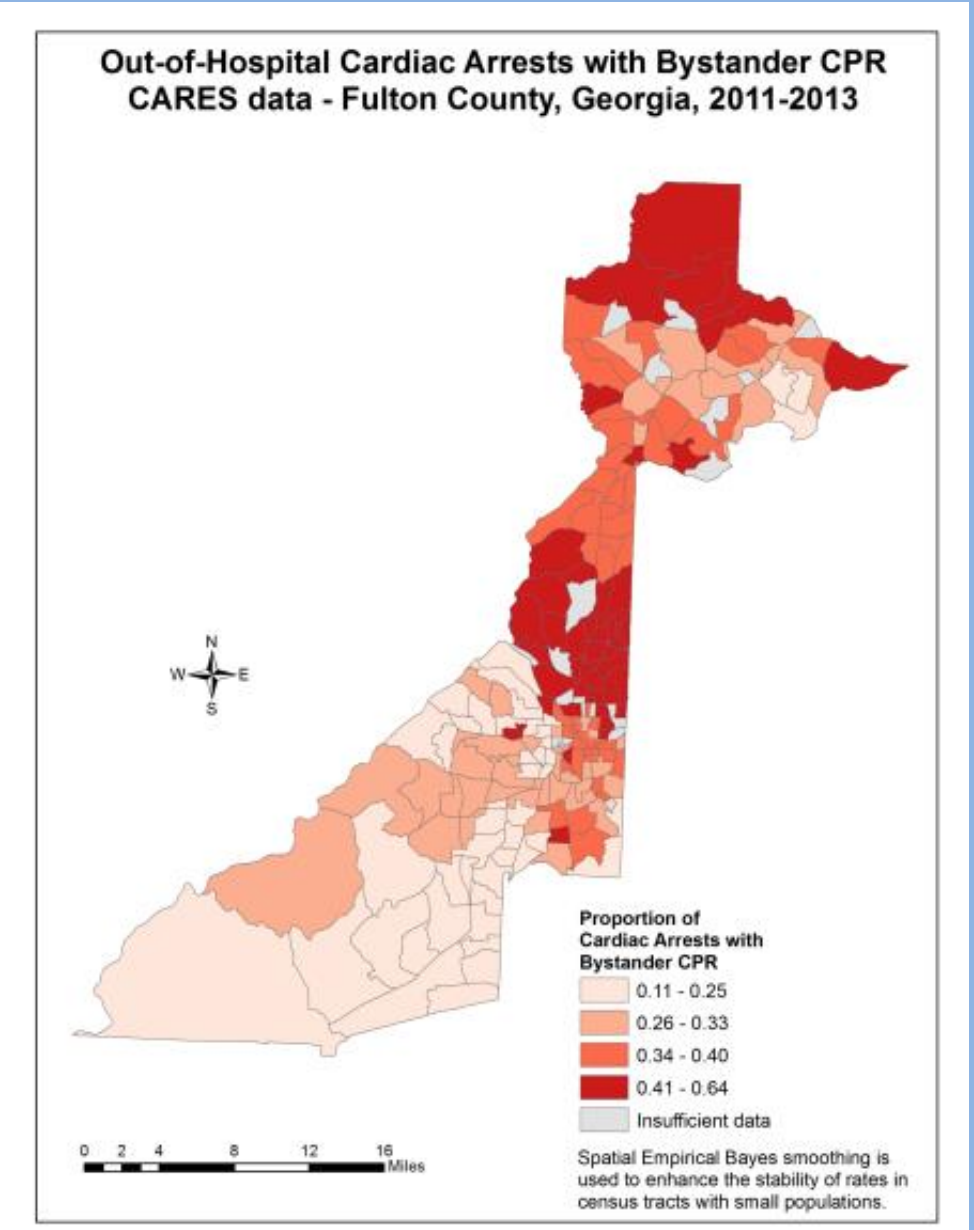
CARES as the solution

CARES is the data collection mechanism that could:

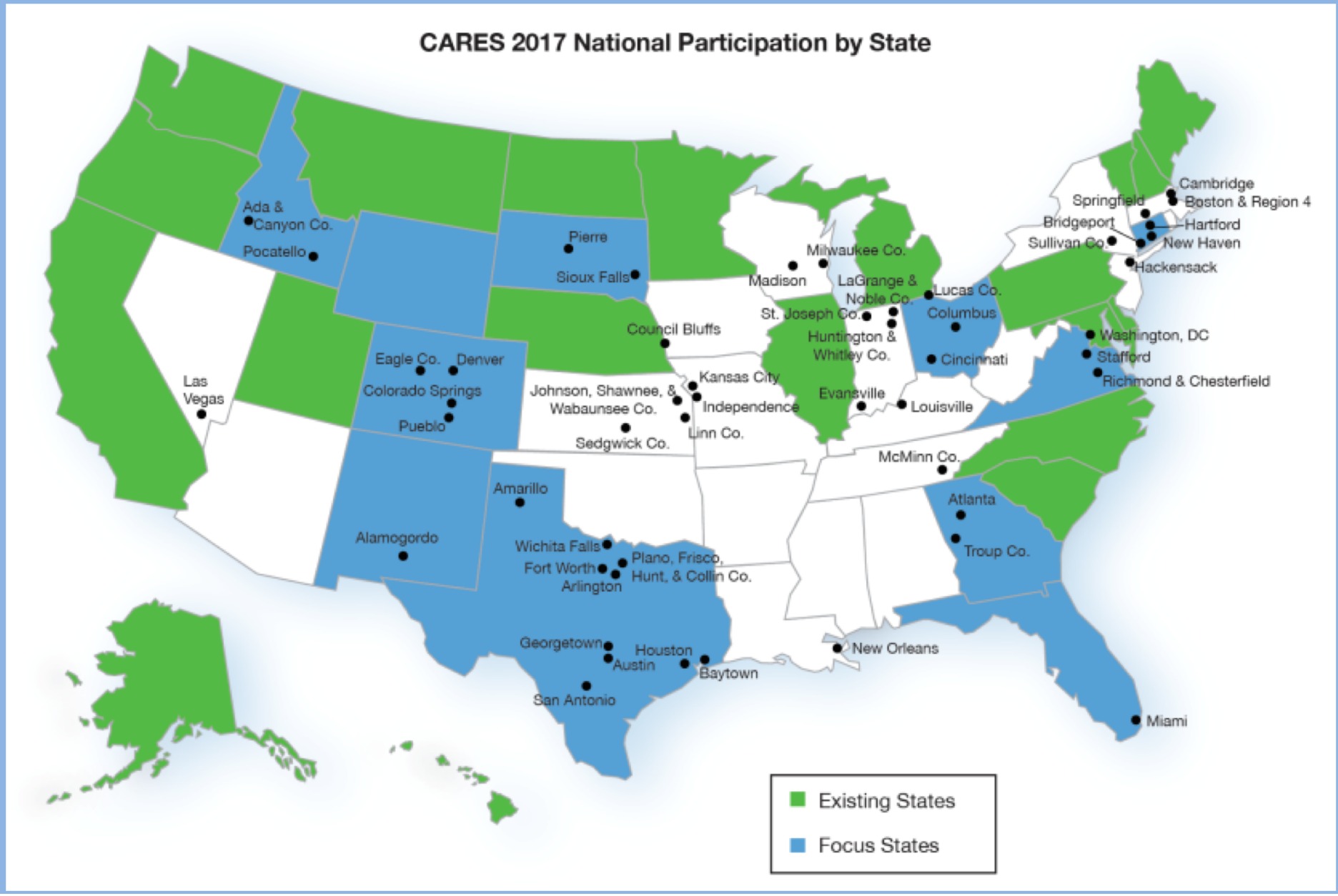
- Make the data collection process more efficient
- Provide the ability to:
  - Identify strengths and weaknesses to improve care
  - Benchmark outcomes with other communities

COLUMBUS FIRE GO-LIVE DATE 9-1-2007

Geo-coded CARES data

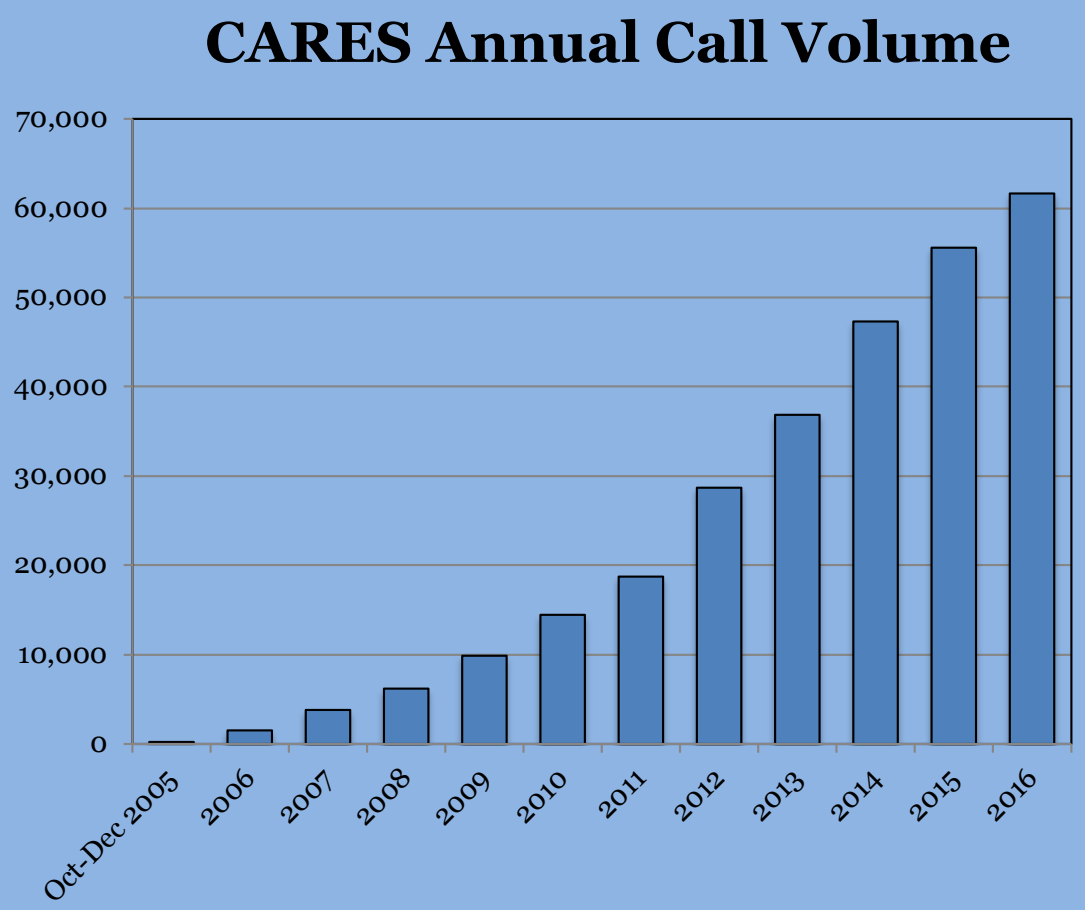


CARES Participant Map



2016 Footprint

- 106 million catchment area
- 33% US pop covered
- More than 1,400 EMS Agencies
- More than 2,000 Hospitals
- 64 communities in 23 states
- 19 statewide participants



What information does CARES collect?

CARES has Two Methods for EMS data collection

Direct entry online and ePCR extraction

Direct Entry Online

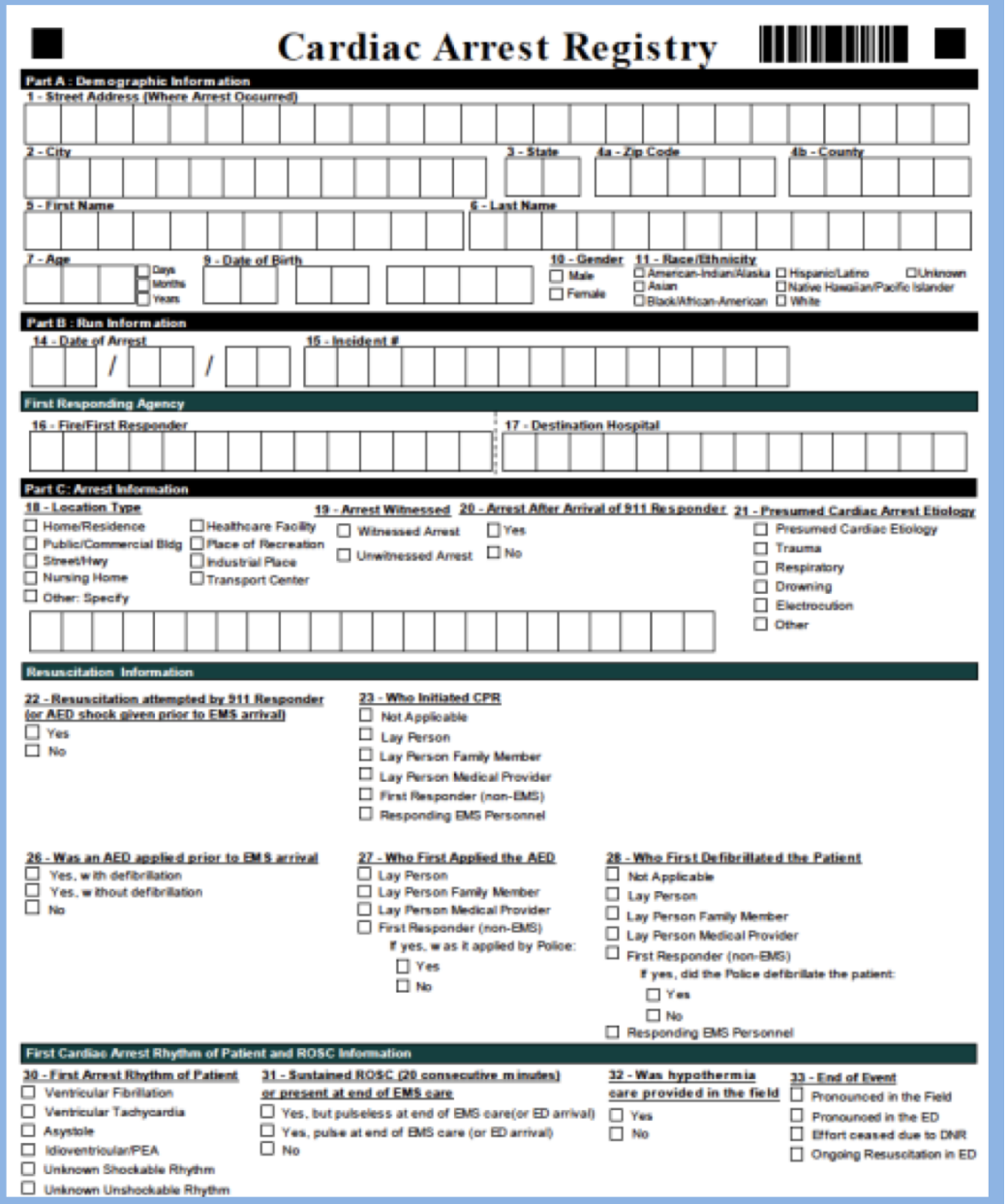
- Data can be entered anywhere there is internet access
- Designated EMS contact
- Data is audited by CARES staff

ePCR Extraction

- CARES compliant vendors:
  - Physio-Control/HealthEMS
  - ImageTrend
  - Open/SafetyPad
  - ESO Solutions
  - Zoll

Required EMS Dataset

- CARES event is:
  - Non-traumatic cardiac arrest
  - Resuscitation attempted by 911 responder
- EMS entry “initiates” the event
- Majority multiple choice fields
- KEEP IT SIMPLE philosophy



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19 - Arrest Witnessed ☐ Witnessed Arrest ☐ Unwitnessed Arrest

20 - Arrest After Arrival of 911 Responder ☐ Yes ☐ No

21 - Presumed Cardiac Arrest Etiology ☐ Presumed Cardiac Etiology ☐ Trauma ☐ Respiratory ☐ Drowning ☐ Electrocution ☐ Other

Resuscitation Information

22 - Resuscitation attempted by 911 Responder (or AED shock given prior to EMS arrival)
☐ Yes ☐ No

23 - Who Initiated CPR
☐ Not Applicable ☐ Lay Person ☐ Lay Person Family Member ☐ Lay Person Medical Provider ☐ First Responder (non-EMS) ☐ Responding EMS Personnel

26 - Was an AED applied prior to EMS arrival
☐ Yes, with defibrillation ☐ Yes, without defibrillation ☐ No

27 - Who First Applied the AED
☐ Lay Person ☐ Lay Person Family Member ☐ Lay Person Medical Provider ☐ First Responder (non-EMS)
If yes, was it applied by Police: ☐ Yes ☐ No

28 - Who First Defibrillated the Patient
☐ Not Applicable ☐ Lay Person ☐ Lay Person Family Member ☐ Lay Person Medical Provider ☐ First Responder (non-EMS)
If yes, did the Police defibrillate the patient: ☐ Yes ☐ No
☐ Responding EMS Personnel

First Cardiac Arrest Rhythm of Patient and ROSC Information

30 - First Arrest Rhythm of Patient
☐ Ventricular Fibrillation ☐ Ventricular Tachycardia ☐ Asystole ☐ Idioventricular/PEA ☐ Unknown Shockable Rhythm ☐ Unknown Unshockable Rhythm

31 - Sustained ROSC (20 consecutive minutes) or present at end of EMS care
☐ Yes, but pulseless at end of EMS care(or ED arrival) ☐ Yes, pulse at end of EMS care (or ED arrival) ☐ No

32 - Was hypothermia care provided in the field ☐ Yes ☐ No

33 - End of Event ☐ Pronounced in the Field ☐ Pronounced in the ED ☐ Effort ceased due to DNR ☐ Ongoing Resuscitation in ED

Supplemental EMS Dataset

Part D: EMS Interventions (check all that apply)

38 - Mechanical CPR device used: ○ Yes ○ No

If 'Yes', please specify:
- ○ Load-Distributing Band (AutoPulse)
- ○ Active Compression Decompression (LUCAS™ Device)
- ○ Mechanical Piston
- ○ Other

39 - Automated CPR feedback device used: ○ Yes ○ No

40 - Advanced airway successfully placed in the field: ○ Yes ○ No

If 'Yes', please specify:
- ○ Combitube
- ○ King airway
- ○ LMA
- ○ Oral/Nasal ET
- ○ Other

41 - ITD used: ○ Yes ○ No

If 'Yes', select how:
- ○ Bag valve mask
- ○ Endotracheal tube
- ○ Combitube
- ○ King Airway
- ○ LMA
- ○ Oral/Nasal ET
- ○ Other

42 - Were drugs administered: ○ Yes ○ No

If 'Yes', select drugs given:
- ☐ Epinephrine
- ☐ Atropine
- ☐ Amiodarone
- ☐ Bicarbonate
- ☐ Dextrose
- ☐ Lidocaine
- ☐ Vasopressin
- ☐ Other

43 - Vascular access: ☐ No IV ☐ IV ☐ IO

44 - 12 Lead: ○ Yes ○ No

45 - STEMI: ○ Yes ○ No ○ Unknown

If 'Yes', select location: ○ Anterior ○ Inferior

CARES Hospital Dataset: Required & Supplemental

Part E: Hospital Section - Please complete the following questions

46 - ER Outcome
- ◯ Resuscitation terminated in ED
- ◯ Admitted to hospital
- ◯ Transferred to another acute care facility from the ED

47 - Was hypothermia care initiated or continued in the hospital
- ◯ Yes
- ◯ No

48 - Hospital Outcome
- ◯ Died in the hospital
- ◯ Discharged alive
- ◯ Patient made DNR

If yes, choose one of the following:

- ◯ Transferred to another acute care hospital
- ◯ Not yet determined

49 - Discharge From The Hospital
- ◯ Home/Residence
- ◯ Rehabilitation facility
- ◯ Skilled Nursing Facility/Hospice

50 - Neurological Outcome At Discharge From Hospital
- ◯ Good Cerebral Performance (CPC 1)
- ◯ Moderate Cerebral Disability (CPC 2)
- ◯ Severe Cerebral Disability (CPC 3)
- ◯ Coma, Vegetative State (CPC 4)

Hospital procedures

51 - Was the final diagnosis acute myocardial infarction: ◯ Yes ◯ No

52 - Coronary Angiography Performed: ◯ Yes ◯ No ◯ Unknown

If yes, provide date and time: - hh : mm

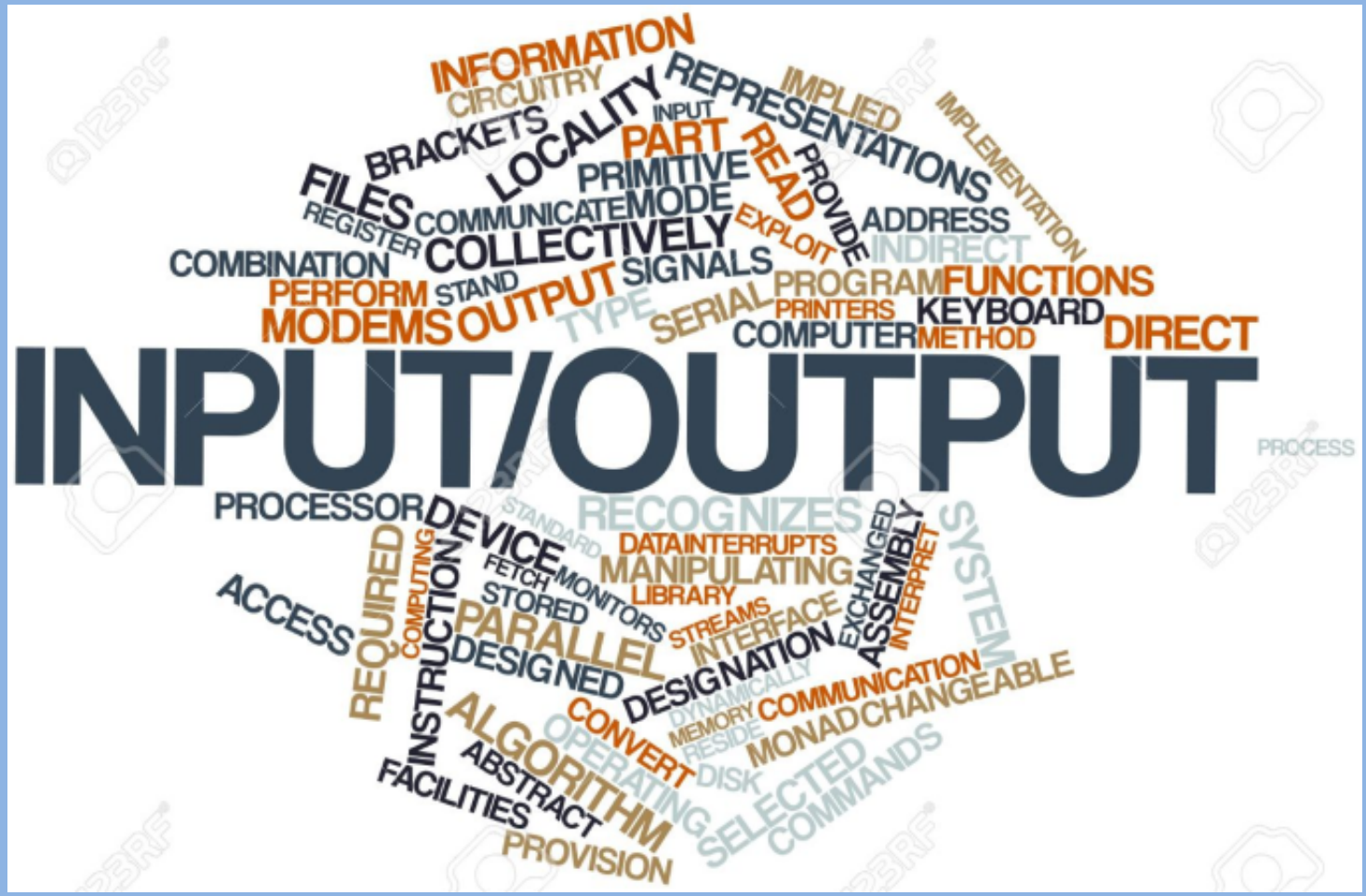
53 - Was a cardiac stent placed: ◯ Yes ◯ No ◯ Unknown

54 - CABG performed: ◯ Yes ◯ No ◯ Unknown

55 - Was an ICD placed and/or scheduled: ◯ Yes ◯ No ◯ Unknown

Hospital Comments

What is the output?



CARES Summary Report

Demographic and Survival Characteristics of OHCA

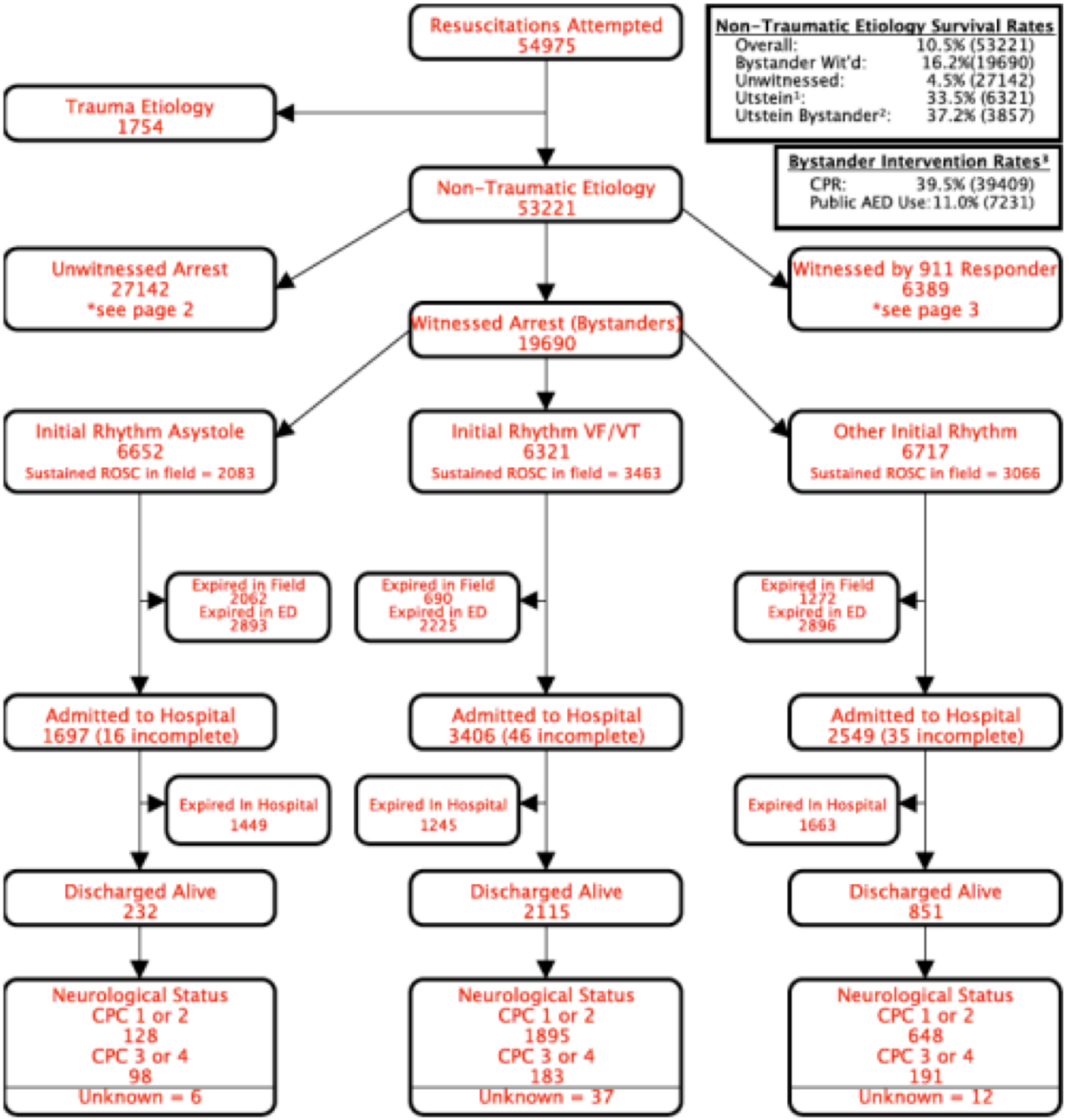
End of the Event: Dead in Field, Pronounced Dead in ED, Ongoing Resuscitation in ED | Arrest Witness Status: All | Resuscitation Attempted by 911 Responder: Yes | Presumed Cardiac Arrest Etiology: Presumed Cardiac Etiology, Respiratory/Asphyxia, Drowning/Submersion, Electrocution, Other, Drug Overdose, Exsanguination/Hemorrhage | Service Date: From 1/1/15 Through 1/31/15

Data	EMS Agency N=42	State N=510	National N=4993
Age	**N=42**	**N=510**	**N=4991**
Mean	57.8	67.3	63.8
Median	61.5	69.0	65.0
Gender (%)	**N=42**	**N=510**	**N=4993**
Female	10 (23.8)	180 (35.3)	2008 (40.2)
Male	32 (76.2)	330 (64.7)	2985 (59.8)
Race (%)	**N=42**	**N=510**	**N=4993**
American-Indian/Alaskan	0 (0.0)	2 (0.4)	23 (0.5)
Asian	2 (4.8)	27 (5.3)	121 (2.4)
Black/African-American	30 (71.4)	24 (4.7)	1065 (21.3)
Hispanic/Latino	0 (0.0)	50 (9.8)	299 (6.0)
Native Hawaiian/Pacific Islander	0 (0.0)	3 (0.6)	40 (0.8)
White	8 (19.0)	180 (35.3)	2294 (45.9)
Unknown	2 (4.8)	224 (43.9)	1151 (23.1)
Location of Arrest (%)	**N=42**	**N=510**	**N=4993**
Home/Residence	27 (64.3)	377 (73.9)	3533 (70.8)
Nursing Home	0 (0.0)	37 (7.3)	563(11.3)
Public Setting	15 (35.7)	96 (18.8)	897 (18.0)
Arrest witnessed (%)	**N=42**	**N=510**	**N=4993**
Bystander Witnessed	9 (21.4)	185 (36.3)	1829 (36.6)
Witnessed by 911 Responder	5 (11.9)	65 (12.7)	579 (11.6)
Unwitnessed	28 (66.7)	260 (51.0)	2585 (51.8)
Who Initiated CPR? (%)	**N=42**	**N=510**	**N=4993**
Not Applicable	0 (0.0)	0 (0.0)	6 (0.1)
Bystander	15 (35.7)	193 (37.8)	2027 (40.6)
First Responder	10 (23.8)	146 (28.6)	1416 (28.4)
Emergency Medical Services (EMS)	17 (40.5)	171 (33.5)	1544 (30.9)
Was an AED applied prior to EMS arrival? (%)	**N=42**	**N=510**	**N=4993**
Yes	10 (23.8)	75 (14.7)	1469 (29.4)
No	32 (76.2)	435 (85.3)	3524 (70.6)
Who first applied automated external defibrillator? (%)	**N=10**	**N=87**	**N=1481**
Bystander	2 (20.0)	14 (16.1)	268 (18.1)
First Responder	8 (80.0)	62 (71.3)	1202 (81.2)
Who first defibrillated the patient?* (%)	**N=38**	**N=510**	**N=4772**
Not Applicable	24 (63.2)	352 (69.0)	3261 (68.3)
Bystander	0 (0.0)	6 (1.2)	82 (1.7)
First Responder	6 (15.8)	26 (5.1)	281 (5.9)
Responding EMS Personnel	8 (21.1)	126 (24.7)	1148 (24.1)
First Arrest Rhythm (%)	**N=42**	**N=510**	**N=4992**
Vfib/Vtach/Unknown Shockable Rhythm	11 (26.2)	95 (18.6)	912 (18.3)
Asystole	26 (61.9)	259 (50.8)	2457 (49.2)
Idioventricular/PEA	4 (9.5)	136 (26.5)	1049 (21.0)
Unknown Unshockable Rhythm	1 (2.4)	21 (4.1)	574 (11.5)
Sustained ROSC (%)	**N=42**	**N=510**	**N=4993**
Yes	13 (31.0)	150 (29.4)	1592 (31.9)
No	29 (69.0)	360 (70.6)	3401 (68.1)
Was hypothermia care provided in the field? (%)	**N=42**	**N=507**	**N=4987**
Yes	2 (4.8)	19 (3.7)	504 (10.1)
No	40 (95.2)	488 (96.3)	4483 (89.9)
Pre-hospital Outcome (%)	**N=42**	**N=510**	**N=4993**
Pronounced in the Field	5 (11.9)	207 (40.6)	1492 (29.9)
Pronounced in ED	10 (23.8)	51 (10.0)	876 (17.5)
Ongoing Resuscitation in ED	27 (64.3)	252 (49.4)	2625 (52.6)
Overall Survival (%)	**N=42**	**N=510**	**N=4993**
Overall Survival to Hospital Admission	14 (33.3)	128 (25.1)	1359 (27.2)
Overall Survival to Hospital Discharge	7 (16.7)	54 (10.6)	508 (10.2)
With Good or Moderate Cerebral Performance	5 (11.9)	45 (8.8)	399 (8.0)
Missing hospital outcome	1	2	16
Utstein[1] Survival (%)	**N=4**	**N=53**	**N=544**
	50.0	43.4	36.8
Utstein Bystander[2] Survival (%)	**N=1**	**N=34**	**N=342**
	0.0	44.1	40.1

Utstein Survival Report

All Agencies/National Data

Service Date: From 1/1/15 Through 12/31/15



CARES Funding "History" & Subscription Fee Overview

- CDC funded CARES from 2004-2012
- In 2012, CARES transitioned to private funding
  - Funders asked CARES to pursue a more sustainable funding model
- CARES implemented a subscription model in 2016
- Participants can subscribe as an individual site/community

Site & State Fees for Subscription Model

Type of Subscription	Population	Annual Cost
Site	< 300,000	$1,000
Site	300,001-750,000	$2,500
Site	750,001+	$5,000
State	Not Applicable	$15,000


CANADA
Michigan
Lake Erie
N
Toledo
W
E
S
Cleveland
Youngstown
Ohio
Akron
"Buckeye State"
Canton
Indiana
Miami River
Pennsylvania
Columbus
Dayton
Scioto River
Cincinnati
Key
State Capital
City
Water
West Virginia
Kentucky
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What Do Sites/States Get for their Participation?

- A customized CARES account with 24/hours a day access to the registry
- As many unique users as needed for your account
- Real-time automated reporting features that allow for benchmarking against a national de-identified dataset and state de-identified dataset (as applicable)
- The ability to export your raw dataset into Excel at anytime
- Training and ongoing support from CARES staff
- An annual, finalized national report generated in April each year
- Access to CARES optional dataset modules: Dispatcher Assisted CPR Training, Targeted Temperature Management and CPR Quality Metrics
- Access to all CARES ongoing software updates
- An established network and community of high performing EMS agencies
- Legitimacy with hospitals and the community by participating and reporting through a neutral third party national database


UT
Cleveland Clinic
NEOUCOM
NORTHEASTERN OHIO UNIVERSITIES
COLLEGE OF MEDICINE
Boonshoft
School of Medicine
WRIGHT STATE UNIVERSITY
THE OHIO STATE
UNIVERSITY
COLLEGE OF MEDICINE
OHIO
UNIVERSITY
Heritage
College of
Osteopathic
Medicine
UNIVERSITY OF
Cincinnati

Two years of conference calls


Success.


CARES

$15,000 ANNUAL SUBSCRIPTION FEE

- Key stakeholders identify a person who is the designated “state coordinator”
  - 1 FTE or a portion of an FTE
- Key stakeholders identify pilot agency/city/county and eventually develop a plan for state roll-out
- CARES trains and provides ongoing support to the state coordinator
  - Training is organized into “modules”
  - Conducted via web meetings & phone calls
  - Ability for in-person “crash course”
- State coordinator oversees day to day implementation and operation of the registry in their state
  - Ongoing support from CARES Liaison
  - Primary contact for all participating agencies and hospitals
  - Participates in CARES State Coordinator User Group

In order to engage in statewide participation, key stakeholders in the state must identify a *local coordinator* who oversees CARES operations in the state. This role can be a full FTE or a portion thereof depending on the state population and plans for expansion.

Urban and Rural Partnerships

HeartRescue
UNITED STATES

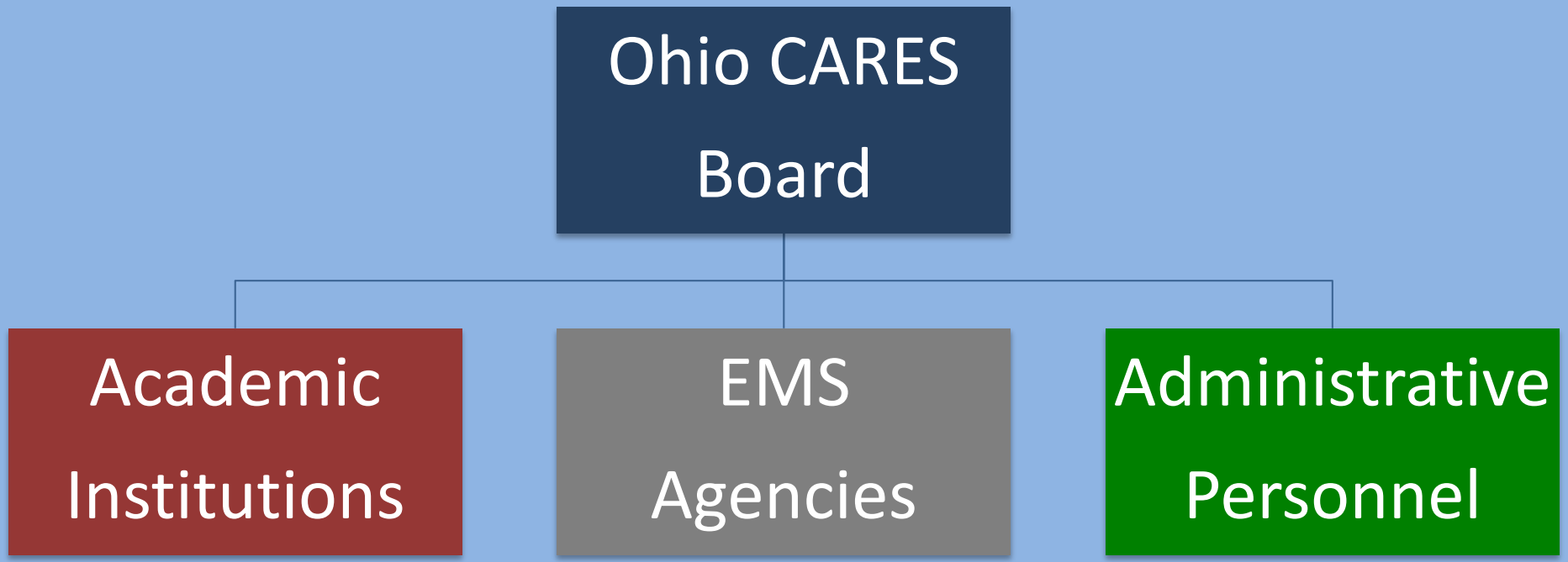
Key goals:

Improve care and outcomes for out-of-hospital cardiac arrest through the "measure and improve" strategy.

Measure cardiac arrest care through the use of CARES

Improve SCA survival rates through use of the Resuscitation Academy model to educate providers and stakeholders on best practices.

State of Ohio CARES Board



Benefits of CARES Participation

"What a community can gain from measuring & truly understanding the quality of its cardiac arrest care and cardiac arrest patient outcomes is invaluable – and I think CARES is the best way to do that."

Douglas Kupas, MD
Commonwealth EMS Medical Director, PA Department of Health

ULTIMATE GOAL