



American  
Heart  
Association.

# Reducing Disparities

for Out-of-Hospital  
Cardiac Arrest



*A Toolkit for Engaging Communities*



**ASSESS**



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**INFLUENCE**

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# Reducing Disparities for Out-of-Hospital Cardiac Arrest

## A Toolkit for Engaging Communities

With Special Thanks to the Following Authors:



Jeanette Previdi, MPH, RN



José Cabañas, MD



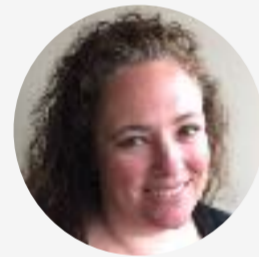
Tia Raymond, MD



William Dillon, MD



Jon Rittenberger, MD



Amber Hoover, RN, MSN



Monique Starks, MD



Adam Kessler, DO



LaToya Stewart, MPH



Timmy Li, PhD, CPI, EMT-B



Anezi Uzendu, MD



Ryan Morgan, MD



Carolyn Zelop, MD

### In Collaboration With:

- AHA's Emergency Cardiovascular Care's (ECC) Systems of Care (SOC) Committee
- Health Disparities Task Force
- AHA's National Community Health Team
- Community and Impact Committees  
Regional Volunteerism

## Major areas addressed in this toolkit include:



- A Mission for Change
- Background data on disparities in incidence, treatment and outcomes in sudden cardiac arrest (SCA)



- Evidence-based guidelines for community response to sudden cardiac arrest (SCA)
- Community response and system of care that should be routine in all communities for sudden cardiac arrest care to optimize the AHA Chain of Survival



- Tools to design and implement a community-driven intervention
- Guidance for using Community Needs Assessment to understand barriers and opportunities before program implementation



- Ways to utilize local Cardiac Arrest Registry to Enhance Survival (CARES) data to guide new community efforts to improve outcomes from SCA
- Identifying and engaging stakeholders in the development of an individualized Community Cardiac Arrest Program
- Outlining a strategic program implementation plan



- Developing strategic partnerships with survivor networks and community organizations
- Supporting strategies that will connect local donors to tangible needs in their communities (i.e. CPR Anywhere kit purchase, AED sponsorships, sponsored community CPR events, etc.)
- Sharing successes and creating a sustainability plan

## Section 1: Introduction – A Mission for Change

A Personal  
Charge from  
Anezi Uzendu, MD



“ I recovered ... not because of an inherent strength or resilience of my own but because of multiple scientific break-throughs, an effective system of care, and excellent training of lay-personnel and healthcare providers.”

**Section Content:** Dr. Uzendu articulates the challenges and inspirational opportunities to improve survival for everyone.

## Cardiology Fellow Inspires Hope and Change – Anezi Uzendu’s Story

My name is Anezi Uzendu and I am a cardiac arrest survivor and cardiology fellow who is writing this statement under the guidance of a leader in resuscitation science and patient care who took care of me in the hospital.

I share this at the onset to openly present my conflict of interest, and in the same breath, substantiate my ability to speak to this topic as few others can.

“...had I been the emergency physician on call the night I was rolled in as a patient, I would not be alive today.”

### Cardiac Arrest During Medical Residency

On November 28th, 2016 as a third-year internal medicine resident, I suffered an out-of-hospital cardiac arrest while playing basketball at a local gym after work.

#### **My odds of survival and full recovery - about 1%. Here’s how the system worked well - *this time*.**

- Bystanders were quick to start CPR.
- I was defibrillated twice on the gym floor for refractory ventricular tachycardia (VT).
- EMS arrived within ten minutes and continued resuscitative efforts, defibrillating another two times en route to the hospital.
- Still in refractory VT, the emergency department staff decided to go another thirteen rounds until I attained return of spontaneous circulation.



At the time in which these decisions were made — based on the length of CPR, and the location of my arrest — my likelihood of survival to hospital discharge with relatively fair neurologic function was **near 1%**.

## Low Expectations for Survival Can Perpetuate Poor Outcomes

Even under optimal circumstances – witnessed arrest, bystander CPR, early defibrillation, short EMS arrival time, etc. – the patient is already more likely to die. Because the majority of arrests do not occur in optimal circumstances, it is easy to see how despair can set in.

This despair leads to self-fulfilling prophecies that survival and reasonable neurologic outcomes are out of reach. These thoughts are shared by not only the patient but also scientists, policy-makers and others.

- **Scientists may relinquish their pursuits** feeling as though their efforts are in vain.
- **Policy-makers may surrender their zeal** when a law does not achieve the outcomes that were envisioned.
- **Decisions to palliate and relieve suffering may be too hastily made** when there are perceived poor prognostic signs like an initial loss in brain stem reflexes, or a prolonged arrest.

These decisions are made by intelligent, compassionate health care professionals that take their sacred Hippocratic oath seriously and above all will “do no harm.” I know this is the case because I was one of those physicians, and I realize that had I been the physician on call in the Emergency Department the night I rolled in, I would not be here today.

## Recovery Brings A New Perspective

I went on to be discharged within 3 weeks, graduate internal medicine residency, and am on the verge of completing cardiology fellowship. I have taken care of other patients who have suffered cardiac arrests, providing more informed and optimistic care than I once would have. One of my past patients has also joined with industry to continue to the fight against sudden cardiac death, and the chain of survivors will hopefully continue. I am involved at the local and national level with efforts to improve outcomes and reduce disparities in out-of-hospital cardiac arrest management.



I am able to do these things, not because of an inherent strength or resilience of my own but because of multiple scientific break-throughs, an effective system of care, and excellent training of lay-personnel and healthcare providers.

I extend gratitude to people who are making a difference.



- **Scientists** – you are making a difference. Discoveries — such as targeted temperature management — are producing survivors who recover to become capable members of society able to again contribute to their communities. Because you've helped them survive, they're now building networks across the country, harnessing their shared experience and passion to further contribute to and catalyze change.



- **Healthcare providers** – your efforts are making a difference. Optimal management of hospitalized patients is returning children home to their parents and parents home to their children.



- **Lay rescuers** – you are making a difference. By starting CPR and using an automated external defibrillator (AED) if available before EMS arrives, you are doubling or tripling the chances that a victim of cardiac arrest will survive.



- **Policy makers and advocates** – you are making a difference. Advances like tele-CPR and requiring CPR training in schools are equipping communities to save the lives of their loved ones.



- **Survivors** – you are making a difference. When you join the movement, your zeal leads to policy implementation and community education. Even if you decide against active work in the sudden death space, your life in the face of death bears witness to the effectiveness of past advancements and inspires the next wave of progress. Survivorship begets survivors. Beyond the measurable outcomes, I believe the most important contribution that survivors have to the cardiac arrest dynamic is inspiring hope.

Recent strides to change the out-of-hospital cardiac arrest paradigm are making substantial improvements in outcomes. From the moment a person suffers a cardiac arrest the cards are stacked against them. But today, all stakeholders have a critical role to play in shaping the future and empowering communities to save more lives.

– Anezi Uzendu, MD





## We Salute Programs Where Survivors, Policy-makers, Community Leaders and Medical Professionals Join Together To Save Lives

Communities can reduce deaths with prevention programs for sudden cardiac deaths. Because of impassioned volunteers, we see successful rollouts like this one deployed in communities. Lindsay’s Law protects student athletes in Ohio by teaching students, parents, and coaches when to screen for risks and how to save lives with CPR.



Lindsay Love Davis,  
SCA Survivor

**Lindsay’s Law**, recently passed in Ohio, requires all prospective athletes under the age of nineteen and their parents to receive information regarding sudden cardiac death, and basic resuscitation.

Lindsay Davis, for whom the law is named, was a former Miss Ohio and dancer. After suffering a sudden cardiac arrest due to hypertrophic cardiomyopathy, she became an unrelenting force for the advancement of this law and other efforts to improve recognition and survival of out-of-hospital sudden cardiac death.

Beyond advocacy many survivor groups work in their communities to provide education and increase awareness of this disease entity. Many put on regular events to teach CPR or hands-only CPR to its constituents.

**All student athletes and their parents receive a two-page hand-out and [sixteen-minute video](#)** focused on educating, empowering and protecting those interested in sport participation. ([View content](#) for Lindsay’s Law.) Stipulations for coaches and return-to-play protocols are included as well.



## Section 2: Background - Out-of-Hospital Cardiac Arrest



Understanding Sudden Cardiac Arrest

“

Cardiac arrest is reversible for most victims if it's treated within a few minutes.

”

**Key content in this section:**

- About Cardiac Arrest
- Disparities
- Causes and Contributing Factors

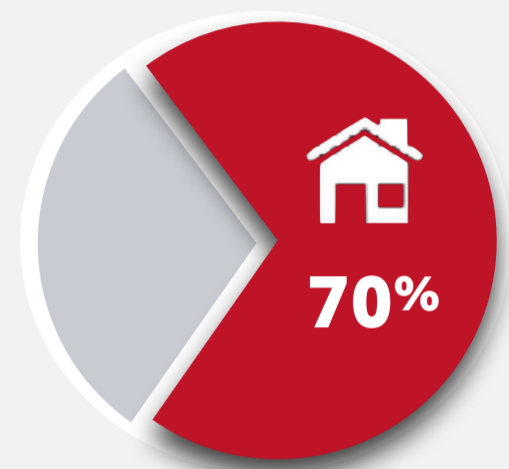
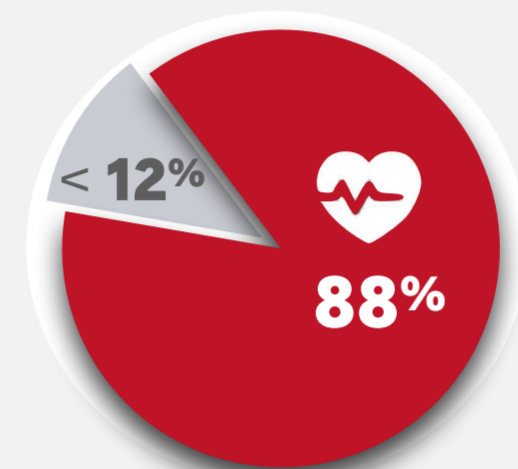
## Section 2: Background - Out-of-Hospital Cardiac Arrest

### The Urgency for Quick Action from Trained Bystanders

- **Sudden cardiac arrest is a leading cause of death.**
- Some **350,000 cases** happen each year outside of a hospital, and the survival rate is less than 12 percent.
- **CPR can double or triple the chances of survival.**
- About **70% of cardiac arrests happen in homes**, and many are not prepared for a cardiac emergency.

CPR yields 2x to 3x better odds for survival which are currently at < 12%.

70% happen in homes, and many people are unprepared.

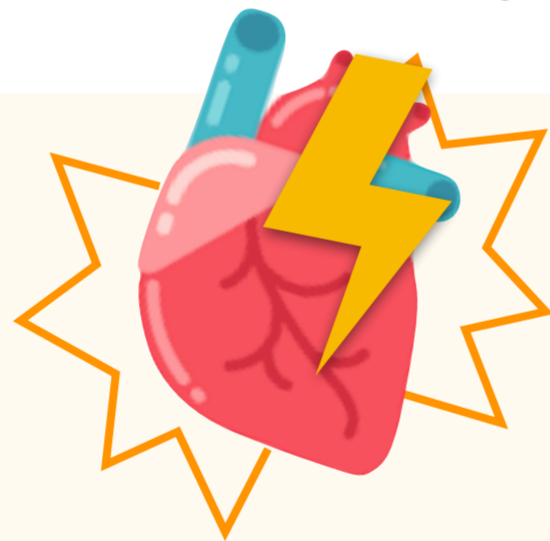


### Understanding Heart Attack and Sudden Cardiac Arrest

People often use these terms interchangeably, but they are not the same.

#### Sudden Cardiac Arrest

An electrical problem that causes the heart to stop.



**Sudden cardiac arrest** is triggered by an electrical malfunction in the heart that causes an irregular heartbeat (arrhythmia).

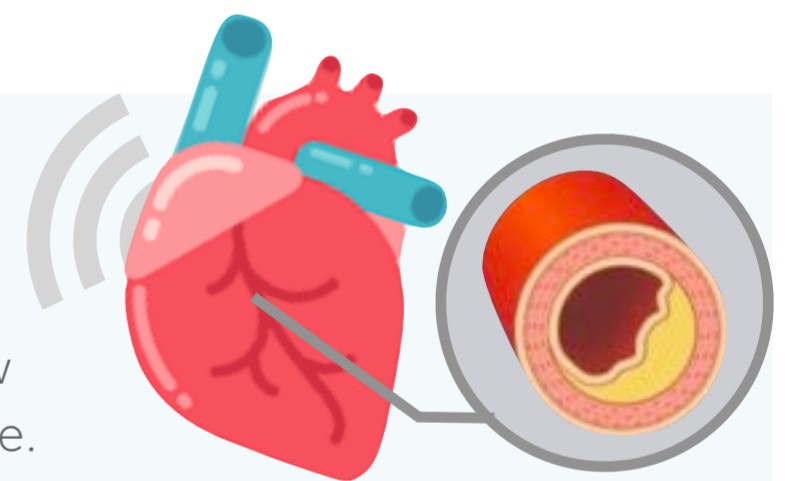
**SCA occurs suddenly and often without warning.**

With its pumping action disrupted, the heart cannot pump blood to the brain, lungs and other organs. Seconds later, a person loses consciousness and has no pulse.

Without a heartbeat or pulse, death occurs within minutes if the victim does not receive treatment.

#### Heart Attack

A blockage that reduces blood flow to the heart muscle.



A **heart attack** is when blood flow to the heart is blocked, and is a “circulation” problem.

Symptoms of a heart attack *may* be immediate and intense.

**However, it is more common for symptoms to start slowly** and persist for hours, days or weeks before a heart attack.

Unlike a sudden cardiac arrest, during a heart attack the heart usually continues to beat.

## Section 2: Background - Out-of-Hospital Cardiac Arrest

**When sudden cardiac arrest occurs, heart attack is sometimes a cause.**



### **Other causes of cardiac arrest include:**

- Scarring of the heart tissue
- Thickened heart muscle (cardiomyopathy)
- Heart medications
- Electrical abnormalities
- Blood vessel abnormalities
- Recreational drug use

**Cardiac arrest is reversible in most victims if it's treated within a few minutes.**



- **First, call 911** for emergency medical services.
- **If an automated external defibrillator is available use it** as soon as possible.



- **Begin CPR immediately** and
- **Continue CPR** until professional emergency medical services arrive.



- If two people are available to help, one should begin CPR immediately while the other calls 911 and finds an AED.

### **Surviving and Recovering After Cardiac Arrest**

The majority of cardiac arrest survivors have some degree of brain injury and impaired consciousness. Some remain in a persistent vegetative state. Determining the survivor's prognosis and deciding whether to treat or withdraw care is complicated and based on many variables (many of which haven't been thoroughly studied).



### **Factors that Influence Survival Before the Event**

- Age
- Ethnicity
- Poor health including diabetes, cancer, infection, kidney disease and stroke

## Section 2: Background - Out-of-Hospital Cardiac Arrest

### CPR Factors that Influence the Odds of Surviving Cardiac Arrest



- **Quick response of bystanders** between collapse and start of CPR/defibrillation



- **The quality and skill of CPR/defibrillation**



- **Loss of neurological function** during or immediately after CPR



# Section 2: Background - Out-of-Hospital Cardiac Arrest

## Disparities and Cardiac Arrest

Sudden cardiac arrest can occur both in and out of the hospital; it can have both cardiovascular and non-cardiovascular underlying causes.



- As previously noted, out-of-hospital cardiac arrest (OHCA) occurs in over 350,000 Americans each year with low survival rates, making it one of the most important public health problems and a top cause of death from cardiovascular disease. <sup>1, 2, 3</sup>



Early  
CPR



Early  
Defibrillation



Improved  
Outcomes

## Early CPR and early AED Use Can Improve Outcomes for Cardiac Arrest, Yet Missed Opportunities Persist

- OHCA is associated with low survival, but early cardiopulmonary resuscitation (CPR) and early defibrillation can improve outcomes. <sup>4, 5</sup>
- Bystander CPR has been shown to improve OHCA survival in multiple studies. <sup>6, 7, 8</sup>



Only 1/3 of OHCA victims receive bystander CPR. Rates for Blacks and other minorities are even lower.

- Unfortunately, less than half of OHCA patients receive CPR from either professionals or bystanders.
- Bystander CPR is only performed in an estimated one-third of U.S. OHCA victims, despite the widespread availability of community classes.
- Bystander CPR rates are lower for Blacks and other minority groups. <sup>8, 9, 10</sup>

- Bystander CPR does not require mouth to mouth ventilation. Even chest compressions alone improve outcome.
- In addition, bystander use of automated external defibrillators (AEDs) is rare.
- OHCA response with CPR and defibrillation can radically improve survival if administered within the 3-minute time window, but often neither emergency medical services (EMS) nor trained first responders from police or fire departments can routinely get to the scene within that time-frame.



## Section 2: Background - Out-of-Hospital Cardiac Arrest

### Disparities and Cardiac Arrest

**Not only do disparities exist in development and treatment of cardiovascular disease (CVD); similarly, they exist in the incidence, recognition, and treatment of sudden cardiac arrest (SCA).**



- SCA incidence is higher in those with lower socioeconomic status (SES).<sup>11</sup>
- Similarly, lower SES is associated with an increased risk of out-of-hospital coronary heart disease (CHD) death and SCD.<sup>12</sup> This is not merely an American phenomenon; similar disparities exist in other countries.<sup>13</sup>
- Lower SES is also an independent predictor of long-term mortality in survivors of SCA.<sup>14</sup>
- Despite national SCA treatment guidelines, not all patients receive evidence-based therapies, with racial and ethnic minorities and women at particularly high risk for under-treatment.<sup>15 16</sup>

### Neighborhood and ZIP Code Risks - The Likelihood of Bystander CPR

A Cardiac Arrest Registry to Enhance Survival (CARES) study demonstrated that specific neighborhood characteristics are associated with a higher likelihood that bystanders will use an AED in response to OHCA. Bystander AED use is associated with an increase in favorable functional outcome.<sup>17, 18</sup>



- **People at greater need are less likely to get bystander CPR.** Citizens from primarily poor, Hispanic, or African American neighborhoods are more likely to need life-saving bystander CPR for an OHCA and are less likely to receive it.<sup>19, 20, 21</sup>
- **Blacks have the highest incidence of OHCA** and are significantly less likely to survive the cardiac arrest.<sup>22</sup>



- **OHCA in black neighborhoods is associated with alarmingly low treatment and survival rates.** Studies have shown lower rates of both bystander CPR and bystander AED use in these neighborhoods.<sup>22</sup>

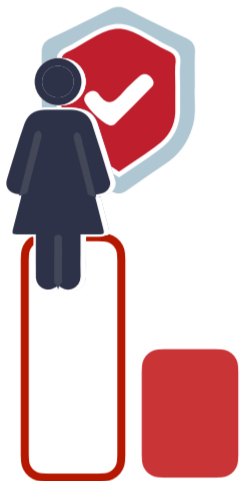
## Section 2: Background – Out-of-Hospital Cardiac Arrest



- While annual rates of CPR training in the United States are low, they also vary widely across communities. Counties located in the south, those with higher proportions of rural areas, black and Hispanic residents, and those with lower median household incomes all have lower rates of CPR training than other communities.



- These data contribute to known geographic disparities in survival of cardiac arrest and offer opportunities for future community interventions.<sup>17</sup>



- In a study in Los Angeles using CARES data, Latinos in Los Angeles received bystander CPR at approximately half the rate of Caucasians.<sup>25</sup>
- Compounding this problem is a lack of availability, knowledge of, and/or ability to afford CPR programs in minority and low-income neighborhoods.

### Other Contributing Factors that Lower the Likelihood of Bystander CPR



- **Socio-economic Factors:** Older age, less education, and lower income are associated with reduced likelihood of CPR training.<sup>26</sup>



- **Communication Slow-downs:** Language barriers and English limitations create challenges for 9-1-1 callers during dispatcher-identified cardiac arrest. These communication slow-downs are associated with less frequent bystander CPR, as well as delays in both recognition of cardiac arrest and implementation of telephone-guided CPR. <sup>23, 24</sup>



## Section 2: Background – Out-of-Hospital Cardiac Arrest

### **The AHA Supports Local Initiatives to Customize CPR Training**

Especially in minority and low-income neighborhoods, communities need novel, evidence-based programs to help citizens prepare to effectively respond to cardiac arrest and improve OHCA treatments and outcomes.

In a study analyzing two cities in Texas, Root E.D., et al concluded: “a geographically targeted CPR training strategy which is tailored to individual and neighborhood population characteristics may be effective in reducing existing disparities in the provision of bystander CPR for out-of-hospital cardiac arrest.”<sup>27</sup> Thus, high-risk neighborhoods can be identified and CPR training can be targeted in the neighborhoods in which it is most likely to be needed.<sup>9, 10, 28, 29, 30, 31, 32</sup>

The American Heart Association and community leaders are uniquely positioned to improve survival in high-risk neighborhoods as AHA seeks to achieve its goals of increasing bystander CPR and survival from OHCA and reducing disparities so that everyone can have the opportunity to enjoy a healthy life.<sup>4</sup>

### **Strengthening the Chain of Survival for High-Risk Communities**

This toolkit is targeted towards strengthening the chain of survival for OHCA in high-risk, minority, and low-income communities. To create impactful and sustainable community interventions, it combines data from sources such as:



- Geospatial location information



- Cardiac Arrest Registry to Enhance Survival (CARES)



- Evidence-based interventions



- Key process and outcomes metrics



- Other research study data

## Section 2: Background – Out-of-Hospital Cardiac Arrest

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## Section 2: Background – Out-of-Hospital Cardiac Arrest

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## Section 3: Chain of Survival – Systems of Care & Community Response



“

The single most impactful intervention is early initiation of CPR and appropriate use of Automated External Defibrillators (AEDs).

”

**Section Content:**

- Why survival odds are often low
- Key links in the Chain of Survival
- Why entire communities should be involved in improvements

## Section 3: Chain of Survival – Systems of Care & Community Response

### **AHA Guidelines and Interventions for Community-Based Cardiac Arrest, Care, and Treatment of SCA**

Summary of Current Evidence-based Guidelines for the Community Treatment of SCA

#### **Data for SCA Demonstrates History of Low Odds of Survival**

Sudden cardiac arrest, specifically out-of-hospital cardiac arrest (OHCA), affects more than 350,000 people in the United States annually. This frequently happens without warning and without prior knowledge of cardiac disease. Historically, the outcome of those who suffer from this disease is very poor, with upwards of 90% not surviving to hospital discharge, despite the best post-cardiac arrest care delivered in the receiving hospitals.



#### **Lack of Blood Flow to the Brain Causes Severe Damage**

Post-cardiac arrest syndrome, specifically anoxic brain injury, is frequently the cause of death in patients who suffer from OHCA. The lack of blood flow to the brain leads to irreversible brain damage prompting families to withdraw life support measures.

#### **Keys to Improving Survival: CPR and AED Use**





Despite advances in post-cardiac arrest care the single most impactful intervention is early recognition and initiation of CPR and appropriate use of Automated External Defibrillators (AEDs). Numerous studies have shown that early initiation of these community-based interventions, as well as early EMS arrival, improves survival. The Cardiac Arrest Registry to Enhance Survival (CARES) database shows this in the supplied graphs from their 2018 data.

Using the same database, researchers have shown that if AEDs were applied to all OHCA, patient survival would increase from 9% to 14%. In those where a lay rescuer witnesses the cardiac arrest and applies AEDs, survival would increase from 16% to 20%. Unfortunately, underserved communities have significantly lower rates of CPR/AED training than their neighboring communities who are not underserved.

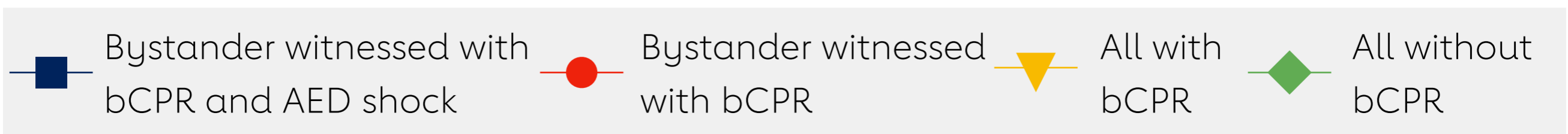
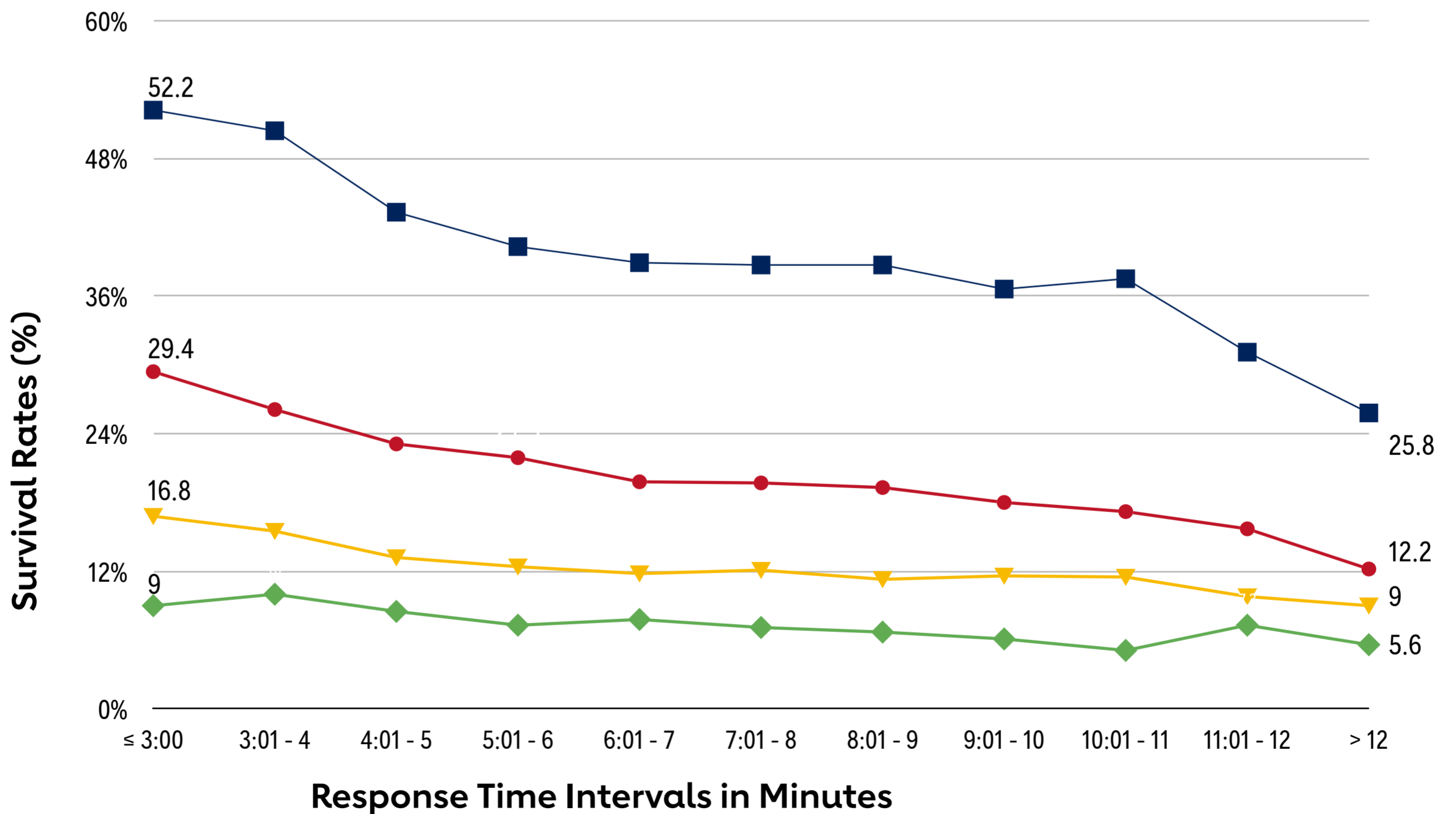
# Section 3: Chain of Survival - Systems of Care & Community Response

## Improving Survival After Out-of-Hospital Sudden Cardiac Arrest:

The most current AHA scientific statement on OHCA Resuscitation Systems of Care suggests the following critical ways to improve survival:

- 
**1) Increase CPR training, specifically in lower-socioeconomic, underserved areas**
- 
**2) Decrease time to EMS activation**
- 
**3) Universal implementation of Telephone-Assisted CPR**
- 
**4) Improve access to bystander AEDs**

## Acting Quickly Saves Lives



# Section 3: Chain of Survival – Systems of Care & Community Response

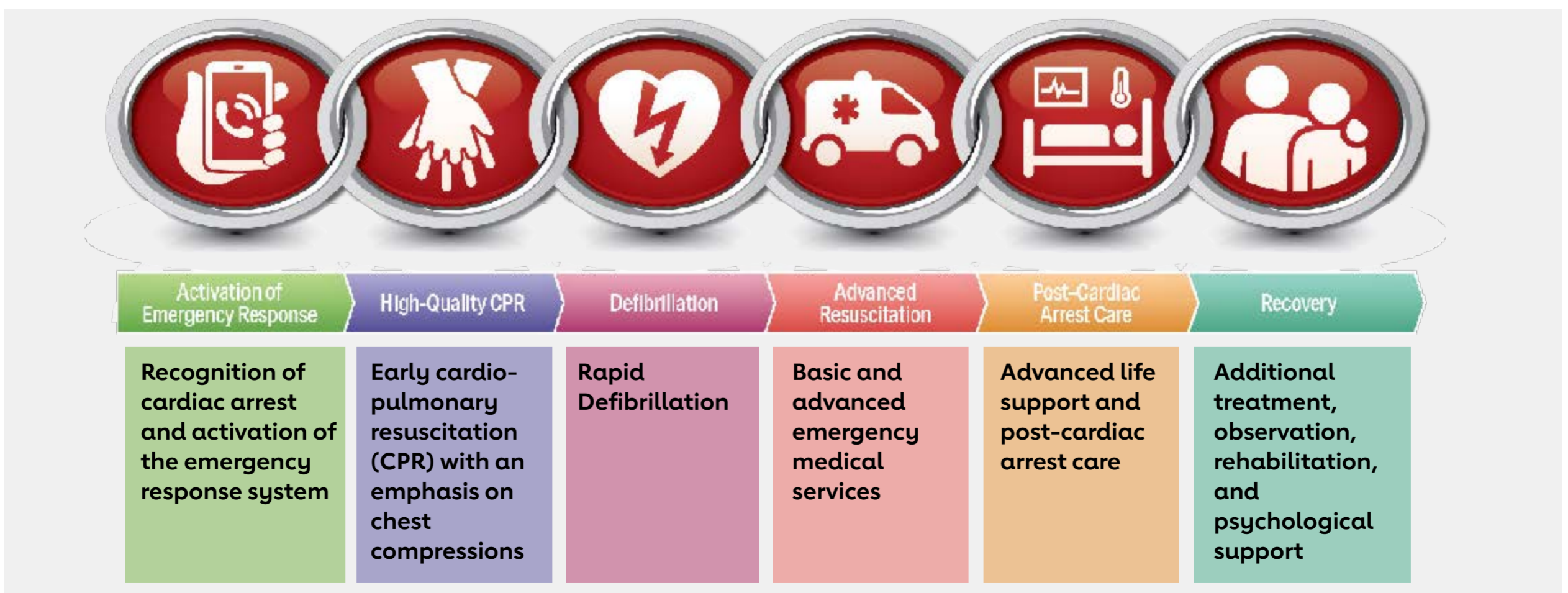
## Optimize the Chain of Survival By Ensuring SCA Treatment Routines

An effective system of care comprises these elements—structure, process, system, and patient outcomes—in a framework of continuous quality improvement.



The term “Chain of Survival” provides a useful metaphor for the elements of the Emergency Cardiac Care systems concept. Patients who have an OHCA depend on their community for support. Lay rescuers must recognize the arrest, call for help, initiate CPR and provide defibrillation (i.e., public-access defibrillation [PAD]) until a team of professionally trained emergency medical service (EMS) providers assumes responsibility and then transports the patient to an emergency department and/or cardiac catheterization lab. The patient is ultimately transferred to a critical care unit for continued care.

## The 6 Links in the Out-of-Hospital Chain of Survival are:



## Section 3: Chain of Survival – Systems of Care & Community Response

A strong Chain of Survival can improve chances of survival and recovery for victims of cardiac arrest. The first three steps — often completed by lay rescuers — are critical links in this Chain of Survival.



- **Link 1 - Recognition of symptoms of an OHCA**

Bystanders must immediately recognize that a cardiac arrest has occurred based on a victim's unresponsiveness and lack of breathing. Victims may also experience agonal breathing, or gasping, and seizures. **Activation** of the emergency response system includes notifying rescue personnel through dialing 9-1-1 or another emergency number.

Calling an emergency response system as soon as possible can give the next two steps in the chain of survival a better chance of success. Although many OHCA's occur at home, some public facilities may also have an on-site alert system that can trigger responses from a designated person or team of trained personnel. Whether or not trained responders arrive, the rescuer should also retrieve an automated external defibrillator (AED) immediately if one is available.

After symptoms have been identified and a bystander has called 9-1-1 or an equivalent emergency response system, immediately begin the next step in the chain of survival.



- **Link 2 - Begin cardiopulmonary resuscitation (CPR).**

- CPR should be started immediately.
- The American Heart Association recommends that chest compressions begin promptly regardless of a rescuer's training or available resources.
- This includes rescuers who are able to add mouth-to-mouth ventilations to chest compressions.

Ideally, the victim will receive high quality CPR, but untrained, hands-only CPR is better than no response from bystanders.





**Here are some quality indicators:**



- **TIMING** - The rate for all ages is 100-120 compressions per minute.
- The AHA advises to push hard and fast in the center of the chest to the beat of the classic disco song "Staying Alive." Another song with an appropriate beat is "Crazy in Love" by Beyonce.



## Section 3: Chain of Survival – Systems of Care & Community Response

- 
- **DEPTH -**
    -  • **For infants**, a compression depth of at least 1/3 the depth of the chest or approximately **1.5 inches** is required.
    -  • **For children**, a compression depth of at least 1/3 the depth of the chest or approximately **2 inches** is required.
    -  • **For adults and adolescents**, a compression depth of **at least 2 inches** is required.
  - **RECOIL -** Rescuers should ensure chest recoil after each compression, sustaining regular compressions without interruption, and avoiding excess ventilation. Untrained rescuers should focus on compression (hands-only) CPR.

During sudden cardiac arrest, the heart stops beating. This can be due to a rhythm disturbance called ventricular fibrillation. This causes the victim to stop breathing and lose consciousness. Administering CPR promptly can help oxygenated blood flow to the heart and brain and help to keep the victim alive until trained medical personnel arrive and until an automatic external defibrillator can be used to restore normal heart pumping.



- **Link 3 - AED - If an AED is available and a victim is not breathing normally, the AED should be used promptly.**
- A rescuer should begin immediately by turning the device on and following the built-in computer's prompts.
- The pads will have diagrams showing how to attach the electrode pads to the victim's chest.
- Once the rescuer is sure no one is touching the victim, a shock can be administered if the computer determines that a shock is needed.

An AED can provide even better survival rates when administered for sudden cardiac arrest. A shock from an AED will help to "restart" the heart by bringing it back from ventricular fibrillation to a normal heart rhythm and correcting the abnormal electrical activity which caused the cardiac arrest.



- **Link 4 - Advanced life support** generally includes high-quality CPR by trained emergency responders, early defibrillation and, if needed, the use of drugs and other devices to care for the victim.
- Along with basic life support, advanced life support works towards the goal of victims of cardiac arrest being discharged from the hospital neurologically intact.

## Section 3: Chain of Survival – Systems of Care & Community Response

While **basic life support** focuses on high-quality CPR and minimal interruptions in chest compressions, adequate ventilation and the use of an AED, advanced life support goes beyond the return of a normal heartbeat to help the patient achieve sound heart health after being discharged.

**Advanced life support procedures**, such as airway management and anti-arrhythmic medications, can help a heart in ventricular fibrillation respond better to defibrillation and help the heart to continue to maintain a normal rhythm.

- \* It's important to note, however, that the previous three steps make advanced life support possible. Without CPR at a minimum and early defibrillation preferably, as well, the likelihood of survival decreases significantly.



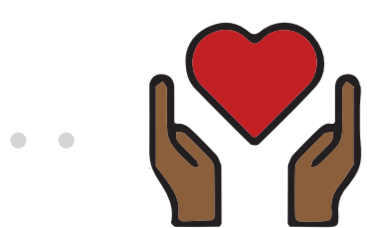
### • **Link 5 - Post Cardiac Arrest Care**

- Quality CPR and fast response can help a victim stay alive long enough to get advanced life support, but post-cardiac arrest care is equally important.
- This step usually happens in the hospital.
- This type of care refers to a multidisciplinary system providing a bundle of care including targeted temperature management, coronary angiography, aggressive intensive care, and delayed neuro-prognostication.



### • **Link 6 - Recovery**

- Discuss recovery expectations and survivorship plans.
- Address treatment, surveillance, and rehabilitation needs.
- Optimize transitions of care to home and to the outpatient setting by providing clear communications with cardiac arrest survivors and their caregivers at hospital discharge.



This link highlights the enormous recovery and survivorship journey, from the end of acute treatment for critical illness through multimodal rehabilitation (both short- and long-term), for both survivors and families after cardiac arrest.

## Section 3: Chain of Survival – Systems of Care & Community Response

This link acknowledges the need for the system of care to support recovery, discuss expectations, and provide plans that address treatment, surveillance, and rehabilitation for cardiac arrest survivors and their caregivers as they transition care from the hospital to home and return to role and social function.

### Improving Survival After OHCA Involves An Entire Community



- **The first responders to out-of-hospital cardiac arrests are generally lay people but if they take quick actions, they can increase survival.**



- **By calling 9-1-1, starting CPR and using an AED** to deliver a potentially life-saving shock, a victim's survival rate can increase by up to three times compared to waiting for the average six to ten minutes for an ambulance and EMS providers to arrive and administer care.



- **Healthcare professionals also enter the chain of survival**, so it's important for these professionals to be well versed in top-quality CPR and both basic and advanced life support.

### References

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- Panchal, A.R., Bartos, J.A., Cabañas, J.G., et al. Part 3: Adult Basic and Advanced Life Support: 2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2020;142:S366–S468.
- Web address: <https://eccguidelines.heart.org/circulation/cpr-ecc-guidelines/part-5-adult-basic-life-support-and-cardiopulmonary-resuscitation-quality>

## Section 4: Program Implementation



A Community Cardiac Arrest Program can help reduce health disparities in the prevention, recognition, and treatment from sudden cardiac arrest, especially when provided for minority and low-income communities.



### **Section Content:**

- Approaches for Successful Program Implementation
- Resources and Funding Considerations
- Recognition and Incentives
- Keeping an Eye on the Bigger Picture of Community Resilience

The toolkit also includes evidence-based cardiac arrest and disparities data, examples of previously successful community programs, and a roadmap for communities to create individualized programs to help eliminate disparities and improve survival in treatment and outcomes after cardiac arrest.

Although the toolkit focuses on secondary prevention after cardiac arrest, primary prevention is key to reducing the incidence of cardiac arrest and should be considered when developing a community program. The intended users of the toolkit are AHA Community Impact Programs across the nation; however, this toolkit is generalizable enough to be used by any community leader committed to improving cardiac arrest outcomes.



### Two Key Approaches for Successful Programs

1. **Securing community involvement in a cardiac arrest program**
2. **Customizing the program to match the community's strengths, weaknesses, barriers, and opportunities**

The committee hopes this toolkit will be helpful to assist communities, especially minority and low-income communities, to develop a Community Cardiac Arrest Program to help reduce health disparities in the prevention, recognition, and treatment from sudden cardiac arrest.

### Implementing a Community-Based Cardiac Arrest Program



Data shows that communities with lower socioeconomic status or high minority populations demonstrate lower survival from OHCA and higher disease burden. Rural communities also experience worse outcomes.<sup>1</sup> Identifying high-risk communities and those most likely to benefit from additional training and resources is important for this project. The [CARES registry](#) is a nationwide data set that could be polled to find sites with survival in the 25–50<sup>th</sup> percentiles.<sup>2</sup> These communities could be targeted for intervention.



- **Recognizing that each community has different needs and strengths, a needs assessment should be completed.** The primary focus should determine potential areas for training and intervention. Communities can utilize focus groups, surveys and key informant interviews to identify strengths and opportunities.



- **The assessment should also identify local champions** who will support the program and ensure its long-term success.
- **Local champions are needed** to build trust with community members and ensure that the intervention remains at the forefront in the community and provide critical feedback to optimize learning from each community's experience.



- **Common themes will likely emerge from the assessment. That information will help communities set individualized goals** and address concerns such as barriers to calling 9-1-1 or fear of performing bystander CPR. People may hesitate to step in when they are worried about repercussions such as deportation, financial or legal entanglement, infectious disease, and/or language concerns.



- **Active communication with the community is critical to ensure success.** These should be regular and focus on the specific needs of the community.



- **Stories and anecdotes can help call attention to the local needs or highlight episodes of everyday laypeople who knew how to respond.** Publicity resources may directly assist members in accessing specific local CPR opportunities. Similar to interventions by Bobrow et al, these communications can occur via telephone, television, or inserts in bills.<sup>3</sup>

### Community as a Classroom



Obtaining support from local celebrities may also increase buy-in from the community. Rather than the traditional approach where rescuers come to a central training center, these interventions will use the community as the classroom. This allows rapid adaptation of the intervention to address both the needs and unique environment of the community.

Many local communities have peer groups who can provide support to both patients and their families. While national survivor networks such as the Sudden Cardiac Arrest Association and Citizen CPR Foundation are commonly associated with these efforts, local communities may rely on church groups, hospital foundations and similar grassroots efforts. Leveraging these existing resources should be a focus as community based cardiac arrest efforts are initiated.

### **Funding, Resources, and a Two-Phased Approach**

Both monetary and non-monetary support can be obtained in the manner noted above. These groups may also be a source of local champions to sustain efforts long-term. Another avenue to pursue may be collaborations with Public Health Departments as an additional resource.

To determine the ultimate success of these programs, close partnership with registries, such as the CARES registry, will be necessary. Measuring both the baseline and post-intervention periods will ensure adequate tracking of the short and long-term effect of these programs.

**A two-phased implementation can be an effective approach.** In phase 1, the focus and resources can center its goals around deploying accessible training, enrolling total numbers of trainees, measuring attendees' comfort with performing CPR. In phase 2, the resources might move to gathering the patient and community success metrics. This phase two focus and goals might be organized around data collection on the rates of bystander-attempted CPR, patient survival, long-term reintegration to the community. Specific outcomes and measurement resources for local consideration are listed in the Measuring Impact section of the Community Cardiac Arrest Program.

### **Recognition and Incentives for Systemwide Improvement**

At the hospital level, rewarding levels of preparedness and quality care are commonly employed for stroke, trauma, and cardiovascular care. Driving forces for motivating hospital staff members may differ from the strategies used for the community at large. Speak with community leaders and local champions to determine how to optimally recognize their efforts and determine appropriate incentives for the community members and local hospital and healthcare professionals.

It's also important to consider how to incentivize local political and legislative bodies. One mechanism may include developing criteria to acknowledge completion of individual components of community preparedness (i.e. cardiac arrest program, or opiate overdose training). The AHA brand is internationally recognized and may also help communities apply for additional philanthropic or grant funding to support these efforts.

### **Thinking Bigger – Developing a Comprehensive Community Resilience Plan**

Finally, the development of a community cardiac arrest program is only one part of a comprehensive community resilience plan. The group should consider using the lessons learned from these efforts to develop other modules such as community training for basic first aid, opiate overdose training, bleeding control and, active shooter response, etc. Collaboration with other organizations can help ensure consistent messaging and education to the community.

### **References**

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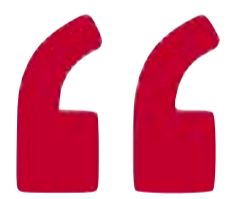
Coppler PJ, Elmer J, Rittenberger JC, Callaway CW, Wallace DJ. Demographic, social, economic and geographic factors associated with long-term outcomes in a cohort of cardiac arrest survivors. *Resuscitation* 2018;128:31-36. PMID: 29705340.

McNally, B., et al. Out-of-hospital cardiac arrest surveillance --- Cardiac Arrest Registry to Enhance Survival (CARES), United States, October 1, 2005--December 31, 2010. *MMWR*; 2011. 60(8): 1-19.

Bobrow BJ, Spaite DW, Berg RA, et al. Chest compression-only CPR by lay rescuers and survival from out-of-hospital cardiac arrest. *JAMA*. 2010;304(13):1447-1454.



## Section 5: Measuring Impact



Partnership between the community organizers, the EMS, and hospital outreach services will be critical to ensure the outcomes are recorded. Tracking outcomes data across the system of care will help all parties better understand the impact at the community level.



**Section Content:**

- The importance of measuring impact
- Determining measurement goals
- Sample metrics and measurement ideas

## Measuring the Impact of a Community Cardiac Arrest Program

As part of the implementation of the toolkit, communities may employ several methods to measure the impact of their efforts. Areas of focus may include total number of community members participating, the effect of the interventions on the participant as well as the patient and overall system of care. Participant-centered measurements may include the following measures both before and after the course.

### Determining Cardiac Arrest Community Program Goals:

Community programs should set goals that are specific, measurable, achievable, and time-sensitive in order to measure success, identify opportunities for improvement, and facilitate program sustainment. The uniqueness of the community and areas for improvement identified in the community needs assessment should help with goal setting. The program should have at least 2-3 specific goals.

#### Examples are noted below:

- Increase the percentage of bystander AED use by 10% by the end of 2024
- Increase the frequency of bystander CPR by 10% by the end of 2024
- Train a minimum of 100 community members in Hands-Only CPR by the end of 2024

The long-term measurements of outcomes represent an additional opportunity for the community to become involved as the patient re-integrates into society. Prior literature has demonstrated that return to normal living requires up to 12 months. This may allow a community member to follow up with the individual, provide outpatient resources and support, while continuing the overall effort of this community toolkit.

System assessment can incorporate both EMS and hospital measures. Ideally, these variables will be recorded prior to the implementation of community training as well as throughout the first year following community training.

See ideas on the following pages to help determine measurement criteria.

Consider Deploying Surveys such as this Likert Scale (1-5 scale):

- Comfort with performing CPR:

Very comfortable		Neutral		Very uncomfortable
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- Comfort with calling for help:

Very comfortable		Neutral		Very uncomfortable
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- Degree you feel the community is engaged in improving public health:

Very engaged		Neutral		Not engaged
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Goals Like These Can Be Set and Progress Measured

- 80% or higher of respondents will feel very comfortable (scale 5) performing CPR after implementation.
- 80% or higher of respondents will increase their comfort performing CPR by 2 or more points on the scale.
- 80% or higher of respondents will feel very comfortable (scale 5) calling for help after implementation.
- 80% or higher of respondents will increase their comfort calling for help by 2 or more points on the scale.
- 80% or higher of respondents will feel the community is very engaged (scale 5) in improving public health after implementation.
- 80% or higher of respondents will feel the community is engaged in improving public health by 2 or more points on the scale.

## Binary Questions May Also Prove Helpful - Like These Examples

- Have you performed CPR in the past year?      YES       NO
- Have you performed CPR since training?      YES       NO   
*(follow up question only)*

## Convening Local Partnerships

Partnership between the community organizers and the EMS and hospital outreach services will be critical to ensure these outcomes are recorded. This is an opportunity for AHA to bring additional resources to help improve care at both the EMS and hospital level. Being able to collect all these data elements across the system of care will help all parties better understand the impact at the community level.

Assessing clinical outcomes are most easily trackable in communities participating in the CARES registry and alternative coordinated database tracking cardiac arrest outcomes. Without coordinated tracking, communities will face a significant challenge that limits their ability to fully understand the impact of this intervention.

## Outcome measures in clinical care may include:

- Primary rhythm of arrest ..... (Shockable?)      YES       NO
- Return of spontaneous circulation (ROSC) at any time during the resuscitation? .....      YES       NO
- ROSC at hospital arrival.....      YES       NO
- Survival to hospital admission .....      YES       NO
- Survival to hospital discharge .....      YES       NO
- AED use (bystander or EMS) .....      YES       NO
- Dispatcher assisted CPR and/or bystander CPR .....      YES       NO

### Additional clinical measures if available may include:

- Hospital length of stay: \_\_\_\_\_
- ICU length of stay: \_\_\_\_\_
- Discharge disposition (*home, acute inpatient rehab, skilled nursing facility, hospice, morgue*)  
\_\_\_\_\_
- Neurologic outcome (modified Rankin Scale - or mRS - at hospital discharge)

### Potential future measures may include:

- 6-month survival
- 6-month neurologic outcome (mRS) - consider adding CPC-Extended coding to discharge and 6-month assessment at selected sites

### Continuous Variables To Consider Including (measured annually):

- EMS dispatches for cardiac arrest/man down/unresponsive individual
- CPR performance by EMS (number)
- Community AED use
- Number of dispatch-assisted CPR responses
- Participation in the CARES registry

#### Binary questions:

- Primary rhythm of arrest (shockable/not-shockable)
- Return of spontaneous circulation (ROSC) at any time during the resuscitation
- ROSC at hospital arrival
- Survival to hospital admission
- Survival to hospital discharge

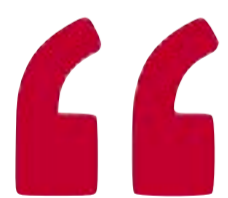
#### Additional measures:

- Hospital length of stay
- ICU length of stay
- Discharge disposition (home, acute inpatient rehab, SNF, hospice, morgue)
- Neurologic outcome (mRS at hospital discharge)

### Overall Goals:

- Increase the percentage of community AED use by 10%
- Increase the number of communities participating in the CARES registry by 25% in non-CARES states.
- In communities where additional toolkit components are used such as community Narcan, consider adding variables assessing the number of dispatches for overdose and the use of Narcan, both by EMS and lay public.

## Section 6: Program Sustainability



Communities and community members build greater trust in sustainable programs. They are more likely to invest in future programs when programs that they invest in iterate, evolve, and grow stronger.



**Section Content:**

- The importance of program sustainability
- Factors associated with sustainable programs
- Specific Ideas for Ensuring Sustainability in your Community's Cardiac Arrest Program

## Sustainability of a Community Cardiac Arrest Program

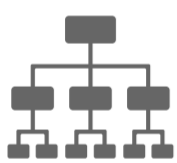
### Background - Why Sustainability Is Important

- Failure of sustaining an effective program leads to detrimental effects for the community.
- Program initiation costs (including financial investments as well as time and energy) are high, so lack of sustainability increases the relative cost of the intervention / program.
- Communities and community members lose trust and are less likely to invest in future programs when programs that they invest in are lost or terminated.

### Factors Associated with Sustainable Community-Based Programs



- **Program champions / leaders:** Literature regarding the sustainability of community-based programs consistently identifies effective leadership as the most vital element for success. Program leadership should include individuals who are passionate and invested in the mission of the program, who have the bandwidth to oversee it, and who are respected and trusted by the broader organization or the community at large.



- **Organization / stability:** Development of an explicit organizational structure ensures that responsibilities are understood and can help sustain a program through changes in leadership, membership, or the community's needs. This includes the clear outlining of roles and responsibilities of program leadership and a consistent schedule of meetings and events that become expected from the membership.



- **Program effectiveness:** Logically, a successful program is more likely to garner support and withstand the test of time. This not only necessitates actually developing a successful program, but also requires the development of metrics to measure success and then advertising those successes to the community in order to encourage their continued buy-in.



- **Participation:** Community engagement and participation is contagious. Early investment in advertising and engaging the community will lead to higher rates of long-term participation and program sustainability.



- **Responsiveness:** No program is perfectly designed from the onset. Seeking feedback and revising the program's organization, schedule, activities, and metrics is important for retaining interest of the community.



- **Community-specificity:** What works for one community will not work for all communities. Successful and sustainable programs take the basic structure of similar successful programs and then adapt them to the needs and culture of their community.

### Specific Ideas for Ensuring Sustainability in your Community's Cardiac Arrest Program

- **Develop an organizational structure** with a well-defined, transparent division of responsibilities.
- **Develop a standing schedule of events** and meetings that are predictable for leadership and membership. This should include both the broader events for the communities as well as the meetings of the steering committee or program leadership. The default of having a meeting avoids the need to plan and schedule a meeting de novo, which can result in long periods of time without meetings or events.
- **Advertise your program** in a way that matters to your community and in a forum in which they will see/hear it.
- **Harness people's competitive edge and community pride:** Hold a competition (between individuals, teams, or the CPR program of another community) – it can be a long-term competition (e.g., number of people trained) or a one-time competitive event (e.g., CPR Olympics in which actual skills are tested).
- **Keep track of progress:** Like an effective fundraising campaign, set goals and tell people about them.
- **Recognize individuals for their participation and progress** and for their recruitment of others to the program.

### References

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1. Ceptureanu SI, Ceptureanu EG, Luchian CE, Luchian I. Community based programs sustainability. A multidimensional analysis of sustainability factors. *Sustainability* 2018, 10:870.
2. Nielsen AM, Isbye DL, Lippert FK, Rasmussen LS. Persisting effect of community approaches to resuscitation. *Resuscitation* 2014, 85:1450-54.
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5. Stoll S. A mixed-method application of the program sustainability assessment tool to evaluate sustainability of four pediatric asthma care coordination programs. *Preventing Chronic Disease* 2015, 12.



## Section 7: Successful Community Programs



“

Successful programs identify areas of high risk, understand and reduce common barriers to learning, and facilitate interventions that improve CPR training.

”

### **Section Content:**

- Denver Area’s HANDDS program
- Louisville, Kentucky’s Start the Heart Foundation

## Successful Community Cardiac Arrest Programs

### Denver Area HANDDS Program (High Arrest Neighborhoods to Decrease Disparities in Survival)

The usual paradigm for CPR training involves blanketing the community with training. However, another approach involves targeting high risk areas for cardiac arrest with more intensive CPR training.

By identifying high risk areas for cardiac arrest in the community, the HANDDS program was implemented in Denver, Colorado in an effort to reduce disparities in OHCA survival among various underserved groups.



The three-step approach for this program was to:



1. Identify high risk neighborhoods



2. Understand common barriers to learning and performing CPR in these neighborhoods



3. Evaluate and implement a train-the-trainer CPR Anytime intervention designed to improve CPR training in these neighborhoods.<sup>(1)</sup>

## How HANDDS Used the CARES Registry Effectively

**IDENTIFICATION** - High risk neighborhoods were identified through cardiac arrest data from the Cardiac Arrest Registry to Enhance Survival (CARES) in Denver, CO.

- CARES - the largest cardiac arrest registry in the United States - provided initial insights.
- Cardiac arrest data from CARES was de-identified and mapped using geospatial mapping programs to identify the highest risk areas for cardiac arrest in Denver, CO.

**IMPLEMENTATION** - Armed with this data that identified high risk cardiac arrest areas in Denver, CO, then targeted CPR training could occur in those areas.

- Novel techniques were used to penetrate the community such as bilingual CPR instructors, going to churches, community centers, etc.
- The HANDDS program deployed CPR where the need was greatest and in communities with higher risk of cardiac arrest.
- The program reached a higher percentage of underserved and underrepresented CPR populations compared with a traditional CPR training approach.

**IMPACT** - They trained an additional 344 people and improved scores on a knowledge-based test.



### Additional Resources:

Journal article: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4352570/>

See also: [https://www.resuscitationjournal.com/article/S0300-9572\(19\)30074-7/fulltext](https://www.resuscitationjournal.com/article/S0300-9572(19)30074-7/fulltext)

## Louisville, KY Start the Heart Foundation

A similar approach occurred with great success in Jefferson County in Louisville, KY with the Start the Heart Foundation. First, as many barriers to training of Hands Only CPR were removed as possible.

### Approach to Reducing Barriers



- **COST BARRIERS** - It was important to understand common barriers to learning and performing CPR in this neighborhood.
  - Hands Only CPR training was provided at no cost to the recipient.
  - Funding for the program was through local health organizations, businesses, government grants and private donors.



- **TIME BARRIERS** - Classes were short. Training occurred in classes that lasted less than 30 minutes to remove a time barrier.



- **DISTANCE BARRIERS** - To improve the ease of CPR training, CPR instructors went on site to churches, community centers, family reunions, health clinics, public events and anywhere a group wanted to be taught.



- **LITERACY BARRIERS** - In addition, basic de-identified demographic data (such as age, race, ethnicity, ZIP code and level of education) were collected and evaluated to ensure achievement of targeted training goals.

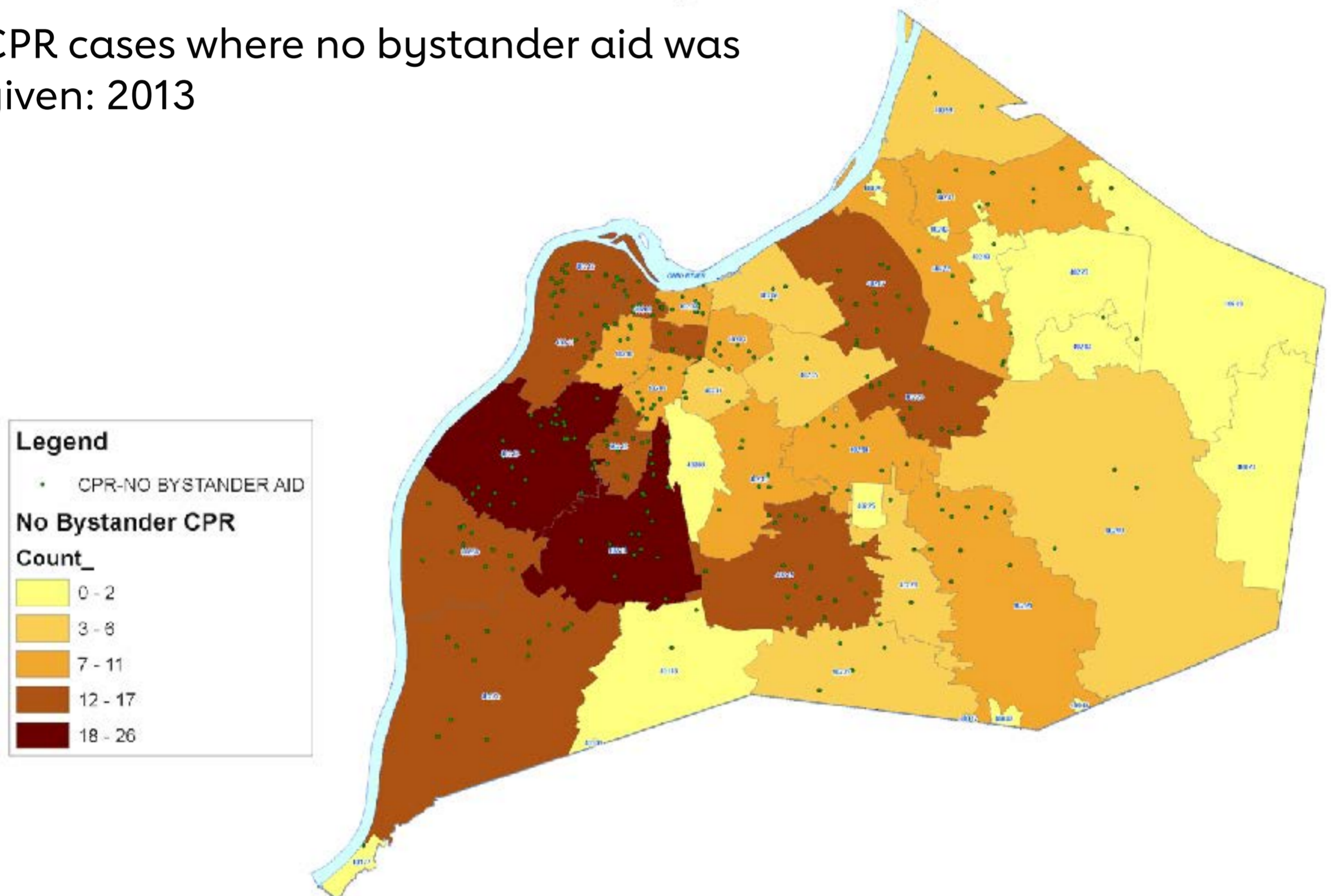
### Approach to Securing Community Buy-In

A two-pronged approach to CPR instruction occurred in this community. First, a systematic Hands Only CPR training of all freshmen high school students in Jefferson County was planned. This provided a traditional blanketed approach to train people throughout the community. Second, building on the success of the HANDDS program, OHCA data were shared from the local EMS agency from the CARES registry through a public access request. That data were evaluated with geospatial mapping and the highest risk areas for OHCA were identified in Jefferson Co., KY. Using these data, these high risk areas were heavily targeted and groups were solicited for Hands Only CPR training. Having an “ambassador” in the neighborhood or organization, greatly facilitated the acceptance of Hands Only CPR training in the high risk neighborhoods. An Ambassador could be a minister, local nurse or physician or any interested person in the neighborhood.

## Louisville, KY Start the Heart Foundation *(continued)*

### Jefferson County - Location and Need Analysis

CPR cases where no bystander aid was given: 2013



Map of cardiac arrest victims that received no bystander CPR by ZIP code in Jefferson Co, KY. Geospatial mapping performed using data from CARES registry.

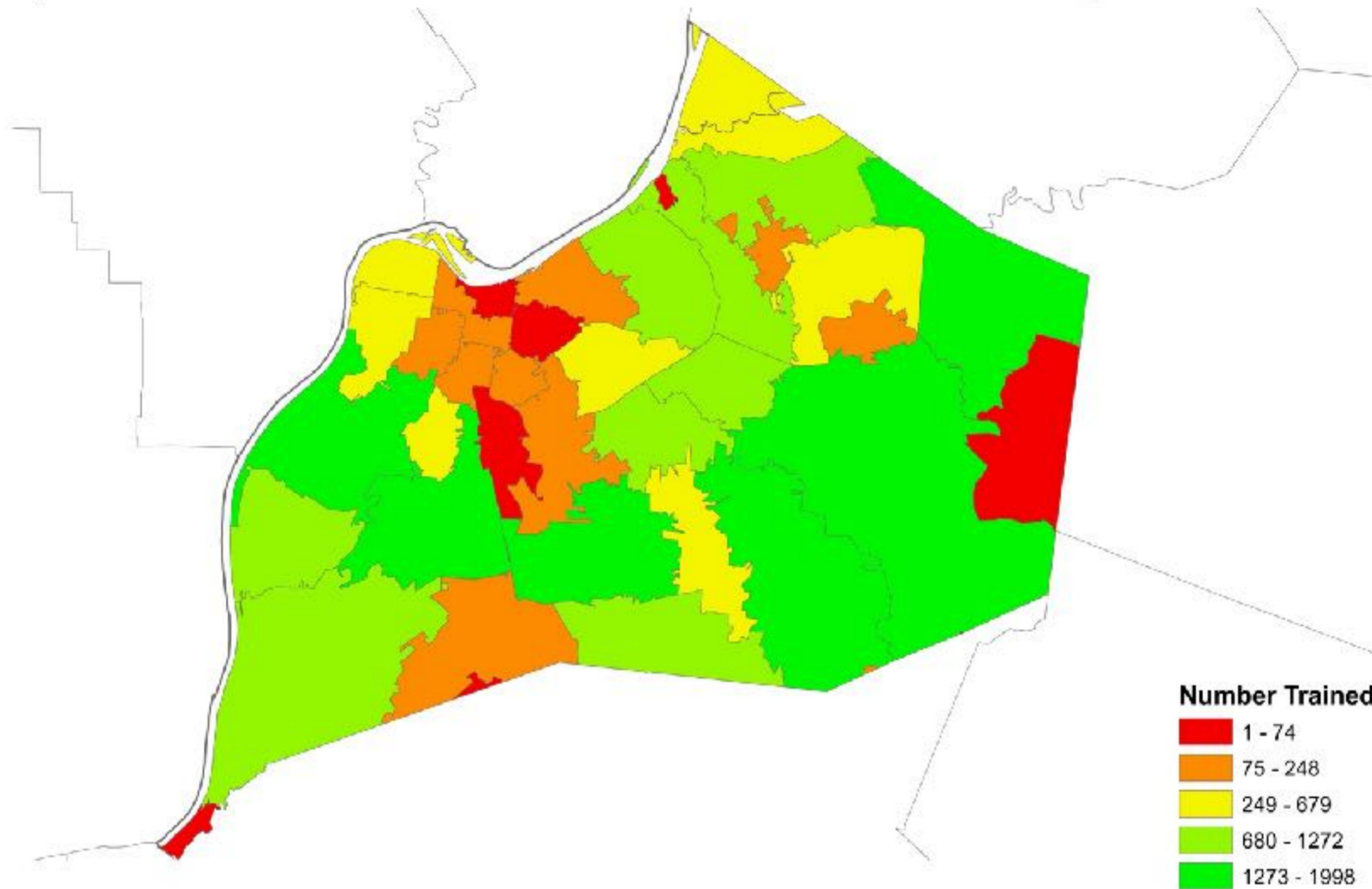
With this blanketed and targeted approach to teaching Hands Only CPR in Jefferson Co., KY, 39% of the people taught Hands Only CPR by the Start the Heart Foundation were classified as minority populations. The overall minority population in Jefferson Co, KY is 28%. (2) This highly successful program has been used to teach over 50,000 people Hands Only CPR in this community over a five-and-a-half-year period.

## Louisville, KY Start the Heart Foundation (continued)

### Jefferson County - Location and Need Analysis

#### Jefferson County, Kentucky

#### Number of Persons Trained in CPR by Zip Code by Start the Heart Foundation



Map of individuals taught Hands Only CPR over a 5.5 year period in Jefferson Co, KY

The critical steps in both of these programs involves the use of OHCA data from local EMS agencies and taking a targeted approach to CPR training. Removing as many barriers to learning Hands Only CPR were critical to the success of both programs. Lastly, a local member of the community targeted greatly facilitated in-roads in a number of high risk areas and communities.

#### References

1. Sasson, C., Haukoos J., Eigel B., Magid D. The HANDDS Program: A systematic approach for addressing disparities in the provision of bystander cardiopulmonary resuscitation. Acad Emerg Med 21 (9):1042-1049

2. 2010 US Census Bureau Statistics of Jefferson Co, KY

## Section 8: Conclusion and Additional Resources

Thank you for your interest in using this Disparities Toolkit to help develop your unique Cardiac Arrest Prevention/Community CPR Program. The committee hopes it has been useful in understanding and working towards reducing disparities in the incidence, recognition, treatment, and survival of sudden cardiac arrest with the ultimate goal of saving more lives!

### Supplemental Materials & Resources



[www.heart.org/cpr](http://www.heart.org/cpr)



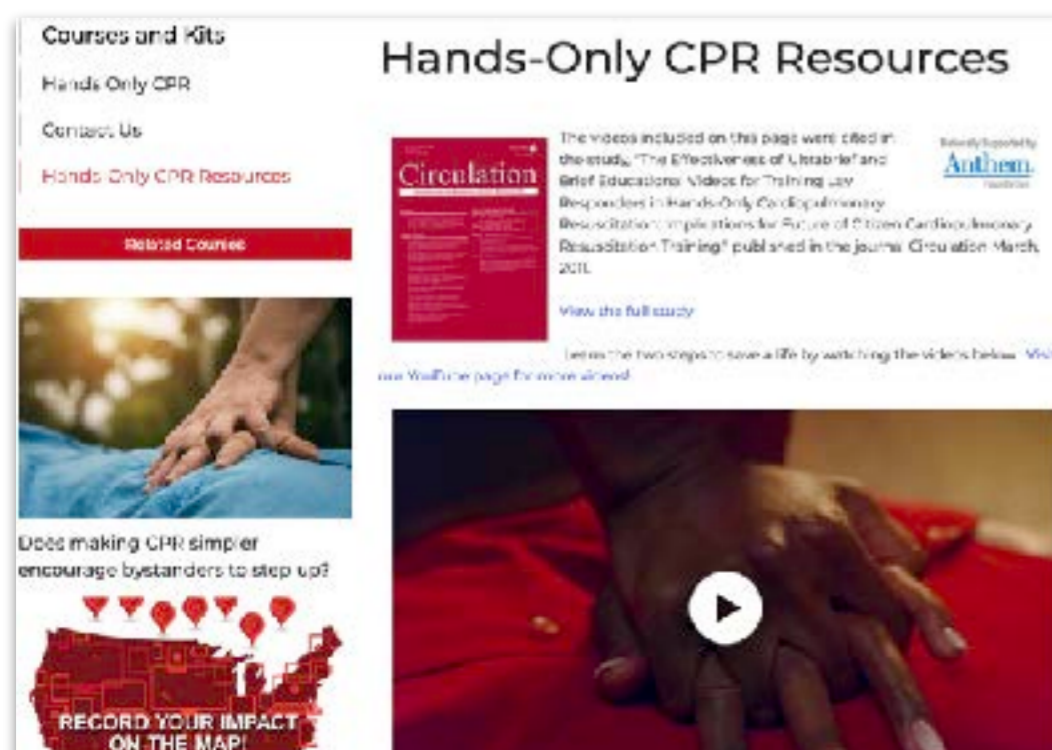
[www.heart.org/handsonlycpr](http://www.heart.org/handsonlycpr)



[New PSA "The Power is in YOUR Hands"](#)



[Hands-Only CPR Instructional Video](#)



[Hands-Only CPR Resources](#)

## Addendum: CV Risks, COVID-19, and Glossary



### **Section Resources:**

- Underlying CVD Risks
- OHCA and COVID-19
- Glossary of Terms



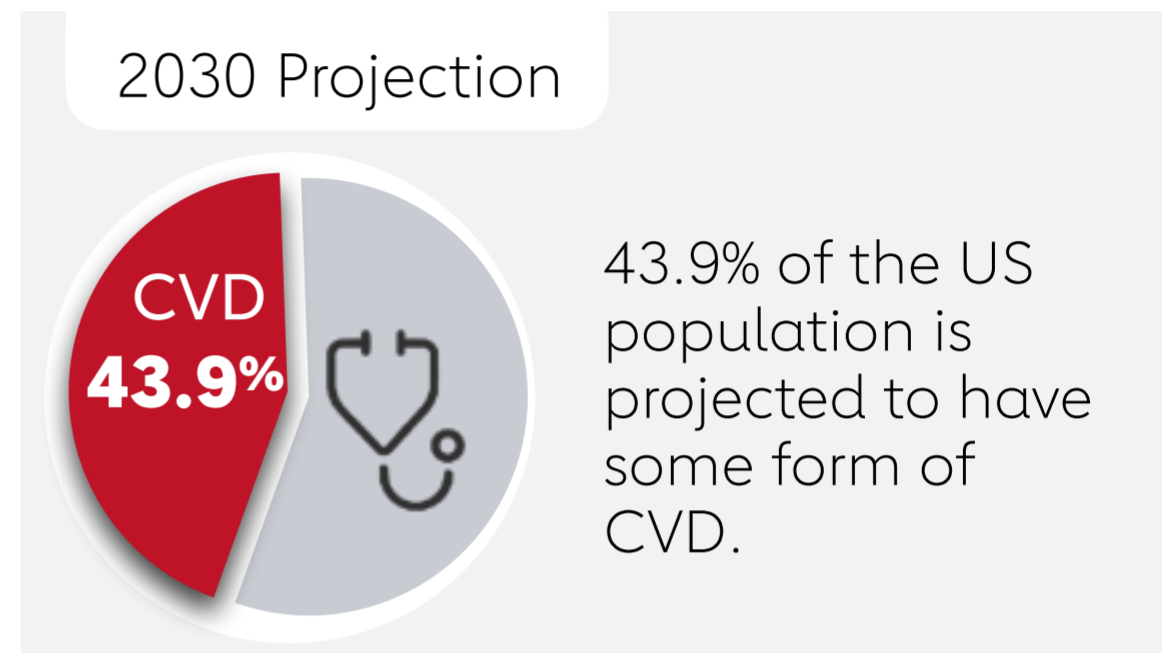
## Background/Introduction - Cardiac Arrest + Underlying CVD Risks

Cardiac arrest may be caused by almost any known heart condition. <sup>1</sup>

An estimated 85.6 million American adults, more than one in three, have more than one form of cardiovascular disease. By 2030, 43.9% of the US population is projected to have some form of cardiovascular disease.

### Cardiovascular disease (CVD) includes:

- High blood pressure (hypertension)
- Congestive heart disease (CHD)
- Heart attack (myocardial infarction)
- Coronary artery disease
- Stroke



### The public health burden of CVD remains high.



- The number one cause of death in the US is in fact cardiovascular disease.<sup>1</sup>



- CVD accounted for more deaths than any other cause in the United States almost every year since 1900, except 1918 and 2020.<sup>2</sup>



- CVD was the listed underlying cause of death for 30.8% of all deaths, or about 1 of every 3 deaths in the United States based on 2013 mortality data published by the Centers for Disease Control.<sup>3</sup>



- On average, approximately 2200 Americans die of CVD each day, an average of 1 death every 40 seconds.



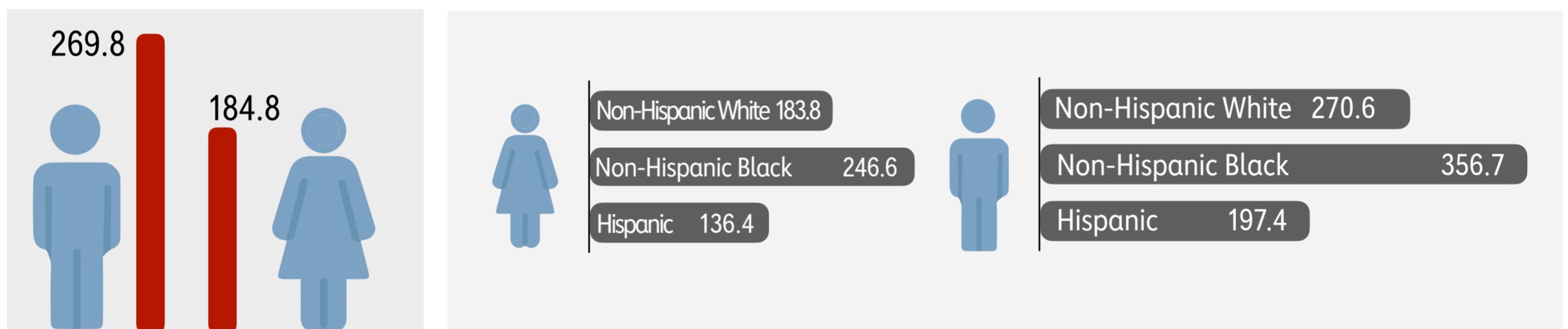
- The death rate attributable to CVD is improving. It was **252.2** per 100,000 in 2008, **222.9** in 2013, and **217.1** in 2018.<sup>4</sup>

Disparities in death rates have been identified by **gender, race, and socioeconomic factors.**

Out-of-hospital cardiac arrest (OHCA) occurs in over 350,000 Americans each year with low survival rates, making it one of the most important public health problems and a top cause of death from cardiovascular disease. <sup>1,5,6</sup>

**The gap in the life expectancy disparity decreased between white and black males.** In 1980, the gap between these two groups was 7 years; however, in 2016, the disparity was only 4 years difference with life expectancies were 76.4 for white males and 72 years for black males.

2013 Overall Age-Adjusted CVD Death Rates per 100,000



**Risk factors for development of cardiovascular disease are well documented as are disparities in CVD development due to underlying risk. Analysis of several data sets by the CDC showed that disparities in adults were common in all risk factors examined.** <sup>1,3,4</sup>




### **OBESITY (Body Mass Index of 30 kg/m<sup>2</sup> or higher)**




- In men, the highest prevalence of obesity (29.7%) was found in Mexican Americans who had completed a high school education.
- Black women with or without a high school education had a high prevalence of obesity (48.4%).




### **HYPERTENSION (or High Blood Pressure)**

- Hypertension prevalence was high among blacks (41.2%) regardless of sex or educational status.

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- HIGH CHOLESTEROL (or Hypercholesterolemia) :**
- Hypercholesterolemia was high among white and Mexican American men and white women regardless of educational status.
  - CHD and stroke were inversely related to education, income and poverty status.

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- HOSPITALIZATIONS for CHF and STROKE:**
-  • Hospitalization was greater among men for total heart disease and acute myocardial infarction.
  -  • Hospitalization was greater among women for congestive heart failure (CHF) and stroke.
  - Among Medicare enrollees, CHF hospitalization was higher among blacks, Hispanics, and American Indian/Alaska Natives than among whites.
  - Stroke hospitalization was highest among blacks. Hospitalizations for CHF and stroke were highest in the southeastern United States.

**OVERALL:**

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- Life expectancy remains higher in women than in men and in whites than in blacks by approximately 5 years.
  - CVD mortality at all ages tends to be highest in blacks.

Although certain groups face increased organizational and social barriers to primary prevention, targeted prevention of elevated risk factors might substantially impact the future incidence of CVD for all groups.<sup>1</sup>

**Central Strategic Impact Goals - Address Barriers to Health and Reduce Disparities**

For 2024, the American Heart Association (AHA) created a new Strategic Impact Goal. In alignment with AHA's 2024 Strategic Impact Goal to advance cardiovascular health for all, programs must be developed to identify and address barriers to health and well-being.

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2024 Goals






As champions for health equity, by 2024, the American Heart Association will advance cardiovascular health for all, including identifying and removing barriers to health care access and quality.

## 4 HEALTH BEHAVIORS

-  • Stop Smoking
-  • Eat better
-  • Get active
-  • Lose Weight

## 3 HEALTH FACTORS

-  • High blood cholesterol
-  • High blood pressure
-  • High blood glucose



Ideal cardiovascular health is defined by the **absence of clinically manifest CVD** together with the **simultaneous presence of optimal levels of all 7 metrics**, including not smoking and having a healthy diet pattern, sufficient physical exercise, normal body weight, and normal levels of total cholesterol, blood pressure, and fasting blood glucose in the absence of drug treatment.<sup>7</sup>

### Programs must aim to reduce disparities and improve health opportunities for all.

Several social risk factors correlate with a lower likelihood of attaining cardiovascular health as measured by Life’s Simple 7 scores, according to surveys by the National Health and Nutrition Examination Survey (NHANES), from 1999 to 2006.

In alignment with AHA’s 2024 Strategic Impact Goal to improve cardiovascular health among all Americans, programs must be developed to help reduce disparities.<sup>8</sup>

### Several social risk factors correlate with reduced odds for cardiovascular health.<sup>8</sup>

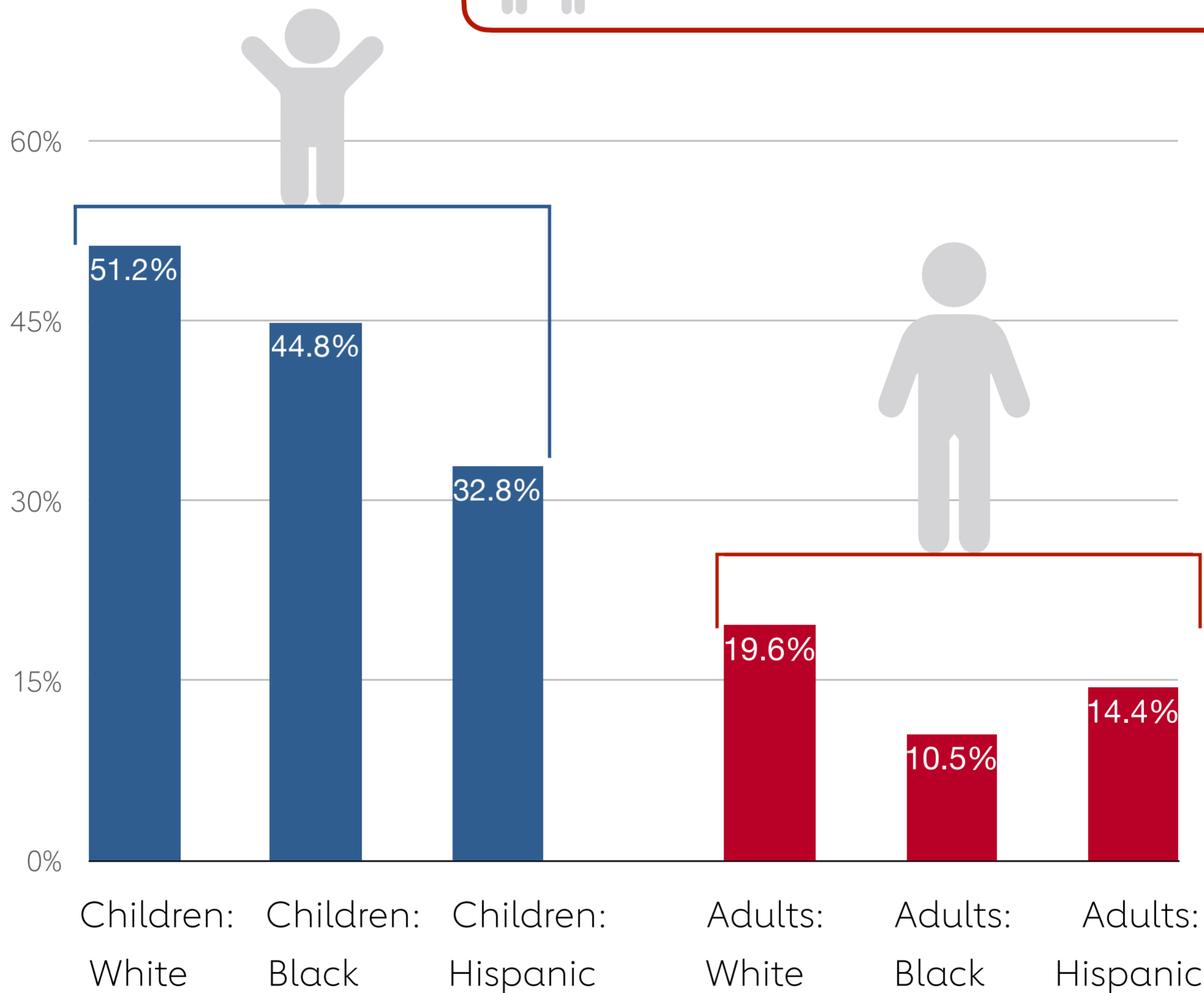
-  • Low family income
-  • Low education level

-  • Minority race
-  • Single-living status

*NHANES Study, 1999 – 2006*

Figures 1 - CV Health Factors - Prevalence of Meeting 5 or Fewer Criteria among U.S. Adults and Children

Health indicators are considerably worse for adults than for children, but disparities persist regardless of age when aggregating for factors indicating ideal health.



## Who, among adults and children, meet 5 or fewer factors for Ideal Health?

Prevalence of meeting  $\geq 5$  criteria for ideal cardiovascular health among US adults aged  $\geq 20$  years (age standardized) and US children aged 12 to 19 years, by race/ethnicity, National Health and Nutrition Examination Survey 2011 to 2012.<sup>1</sup>

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## Bystander resuscitation in the era of COVID-19 or other highly contagious community infections.

### Factors for the responding bystanders:



#### What factors control the risk of infection to the bystander who initiates hands-only CPR?

The prevalence of disease in the community and specific symptoms of the victim before suffering cardiac arrest are important factors affecting the risk of transmission to the responder.



Sometimes these symptoms may not be known, but since the majority of cardiac arrests occur in the home often times the bystander will know the person who suffers a cardiac arrest and their current medical conditions.

#### What additional factors may affect transmission to a bystander if they respond to a cardiac arrest?

The number of aerosolizing particles (virus expelled from the victim) generated by resuscitation actions such as compressions only CPR is still unanswered but thought to be relatively low according to an animal model in a recent study prompted by the current pandemic. Also, it is essential to consider that bystander CPR is typically provided for only a few minutes before EMS arrival.



#### How likely is infection to the bystander who performs hands-only CPR out in the community and what can be done to reduce the risk of transmission?

The risk for infection is determined to be low.

A recent study by Sayer et al. analyzed data from Washington state collected during 2020, concluding that treating 100 patients in the field without personnel protective equipment could result in 1 bystander infection with COVID-19.



If the bystander has a mask, it is appropriate to wear it during the rescue.



In addition, according to the Centers for Disease Control and Prevention (CDC), during the COVID-19 pandemic, keeping hands clean is especially important to help prevent the virus from spreading and handwashing is one of the best ways to protect yourself and your family from getting sick.

You should wash your hands with soap and water for at least 20 seconds or use a hand sanitizer with at least 60% alcohol before and after touching your eyes, nose, or mouth, touching your mask, entering and leaving a public place, and touching an item or surface that may be frequently touched by other people.

## **Is bystander CPR important to the chain of survival for out-of-hospital cardiac arrest?**

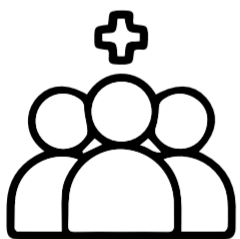
Early bystander CPR can double or triple the chances of survival. As reaffirmed by the 2020 guidelines, quickly recognizing sudden cardiac arrest, prompt activation of the emergency response system, and initiation of hands-only chest compressions is vital to saving lives.

## **Factors to consider when providing CPR training:**

### **What should training facilities or centers who wish to hold CPR education consider during the COVID-19 pandemic?**



Any facility or organization that wishes to conduct training events should start by consulting their local community health guidelines for gathering and community interactions.



Local public health officials have a better understanding of the specific needs or infection rates of their own communities. If gatherings are allowed always follow local protocols for numbers of participants and maintain social distancing.

### **Are there specific actions that trainers should take when conducting a class in the community?**

Ensure that your class environment allows for social distancing and do not share training mannequins. Make sure to thoroughly disinfect all mannequins after each class per the AHA training network recommendations.

### **Are there alternatives to in person training?**

Communities can continue to educate community members by engaging with local media for events like Facebook live CPR demonstrations or connecting to notable community members to hold social media events. Get creative and share the simple steps to save a life through print, live or pre-recorded events.



## Key takeaways for training during highly contagious community infections

Cardiac arrest continues to occur even during pandemics. Continued CPR training is an important service you can provide to empower your community to help their families and neighbors. Always consult your local health department and/or governments for the most current recommendations for your community. For training specific information the American Heart Association routinely updates their guidance and materials online.

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<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html>

<b>Term</b>	<b>Definition</b>
<b>Advanced life support</b>	Emergency care that includes basic life support, with the addition of airway management and medications to help the heart restore normal function.
<b>Automated external defibrillator (AED)</b>	Portable device used to restore normal heart function in certain types of cardiac arrest by delivering a shock/defibrillation.
<b>Basic life support</b>	Emergency care that is focused on high quality cardiopulmonary resuscitation and use of an automated external defibrillator.
<b>Bystander cardiopulmonary resuscitation (bCPR)</b>	Cardiopulmonary resuscitation initiated by a person who is not part of the emergency response.
<b>Cardiopulmonary resuscitation (CPR)</b>	A combination of chest compressions and artificial ventilations to help circulate and oxygenate blood while a person is in cardiac arrest.
<b>Conventional cardiopulmonary resuscitation (conventional CPR)</b>	Cardiopulmonary resuscitation that involves both artificial ventilations and chest compressions.
<b>Cardiac Arrest Registry to Enhance Survival (CARES)</b>	A national database that collects data about out-of-hospital cardiac arrests, with the goal of enabling communities to compare metrics to other communities.
<b>Cardiac arrest / sudden cardiac arrest (SCA)</b>	Sudden cessation of normal heart function, causing the heart to stop pumping blood.
<b>Cardiovascular disease (CVD)</b>	Conditions affecting the heart.
<b>Chain of Survival</b>	Events that must occur in order to maximize the probability of survival for cardiac arrest patients. These events include: 1) activation of emergency response, 2) high-quality CPR, 3) defibrillation, 4) advanced resuscitation, 5) post-cardiac arrest care, and 6) recovery.
<b>Coronary angiography</b>	X-rays of the blood vessels of the heart to visualize blockages.
<b>Defibrillation</b>	Electric current delivered to the heart used to treat certain types of cardiac arrest. Also known as "shock".
<b>Emergency medical services (EMS)</b>	System that provides quick medical treatment, stabilization, and transport for illnesses and injuries in the out-of-hospital-setting. Also known as ambulance services.

<b>Term</b>	<b>Definition</b>
<b>Hands-only cardiopulmonary resuscitation (hands-only CPR)</b>	Cardiopulmonary resuscitation only involving chest compressions, without artificial ventilations.
<b>Heart attack</b>	Condition in which a blood clot blocks flow of blood to the heart, causing death of the heart muscle. Also known as “myocardial infarction”.
<b>Myocardial infarction</b>	Condition in which a blood clot blocks flow of blood to the heart, causing death of the heart muscle. Also known as “heart attack”.
<b>Out-of-hospital cardiac arrest (OHCA)</b>	A cardiac arrest event that occurs outside of a hospital setting (i.e., home, street, public place, etc.).
<b>Post cardiac arrest care</b>	Care provided to patients after a cardiac arrest.
<b>Pulseless ventricular tachycardia</b>	Abnormal rhythm of the heart in which the ventricles contract too fast and fails to circulate blood. Pulseless ventricular tachycardia is a type of cardiac arrest, potentially treatable by defibrillation.
<b>Prognostication</b>	Predicting the outcome of patients based on all available information about the patient.
<b>Shock</b>	Electric current delivered to the heart used to treat certain types of cardiac arrest. Also known as “defibrillation”.
<b>Systems of Care</b>	Organization of individuals, communities, and entities that work together to provide the best possible patient care.
<b>Targeted temperature management (TTM)</b>	Treatment of cardiac arrest patients that involves maintaining a specific body temperature in order to improve brain function. Also known as “cooling” or “therapeutic hypothermia”.
<b>Ventricular fibrillation (VF)</b>	Abnormal rhythm of the heart in which the ventricles quiver instead of contracting and fails to pump blood. Ventricular fibrillation is a type of cardiac arrest, potentially treatable by defibrillation.
<b>Ventricular tachycardia (VT)</b>	Abnormal rhythm of the heart in which the ventricles contract too fast.
<b>Witnessed cardiac arrest</b>	Cardiac arrest event that is observed by another person as it first occurs.