AHA SCIENTIFIC STATEMENTS

The American Heart Association Emergency Cardiovascular Care 2030 Impact Goals and Call to Action to Improve Cardiac Arrest Outcomes: A Scientific Statement From the American Heart Association

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Abstract: Every 10 years, the American Heart Association (AHA) Emergency Cardiovascular Care Committee establishes goals to improve survival from cardiac arrest. These goals align with broader AHA Impact Goals and support the AHA's advocacy efforts and strategic investments in research, education, clinical care, and quality improvement programs. This scientific statement focuses on 2030 AHA emergency cardiovascular care priorities, with a specific focus on bystander cardiopulmonary resuscitation, early defibrillation, and neurologically intact survival. This scientific statement also includes aspirational goals, such as establishing cardiac arrest as a reportable disease and mandating reporting of standardized outcomes from different sources; advancing recognition of and knowledge about cardiac arrest; improving dispatch system response, availability, and access to resuscitation training in multiple settings and at multiple time points; improving availability, access, and affordability of defibrillators; providing a focus on early defibrillation, in-hospital programs, and establishing champions for debriefing and review of cardiac arrest events; and expanding measures to track outcomes beyond survival. The ability to track and report data from these broader aspirational targets will potentially require expansion of existing data sets, development of new data sets, and enhanced integration of technology to collect process and outcome data, as well as partnerships of the AHA with national, state, and local organizations. The COVID-19 (coronavirus disease 2019) pandemic, disparities in COVID-19 outcomes for historically excluded racial and ethnic groups, and the longstanding disparities in cardiac arrest treatment and outcomes for Black and Hispanic or Latino populations also contributed to an explicit focus and target on equity for the AHA Emergency Cardiovascular Care 2030 Impact Goals.

Key Words: AHA Scientific Statements ■ health equity ■ heart arrest ■ resuscitation

n 2010, the American Heart Association (AHA) Emergency Cardiovascular Care (ECC) Committee identified specific goals focused on increasing survival from cardiac arrest. Targets for 2020 included training 20 million people per year, doubling bystander response, and doubling out-of-hospital cardiac arrest (OHCA) and in-hospital cardiac arrest (IHCA) survival. Whereas substantial improvements have been achieved over the past decade toward these goals,[1] cardiac arrest remains a major public health problem and the leading cause of death and morbidity in the United States.[2]

The 2010 goals provided a road map for key strategic areas of focus for improving cardiac arrest outcomes.[3] Furthermore, these priorities are used by the ECC Committee for strategic planning and for ECC organizational aims to make meaningful advancements in creating an ecosystem of training, response, action, and follow-through for the public and for health care professionals.

This scientific statement identifies key strategic targets for improving cardiac arrest outcomes by 2030. These priorities were developed through an iterative process led by the AHA ECC Committee. The ECC Committee has >300 volunteers and consists of 3 subcommittees (Science, Education, and Systems of Care), in addition to the Pediatrics Emphasis Group. Members of these committees are leading resuscitation experts representing several disciplines (eg, emergency medicine, medicine, critical care, neurology, pediatrics, surgery, behavioral science) and professional backgrounds (eg, physicians, nurses, paramedics, respiratory technicians, educators), as well as cardiac arrest survivors. Each committee identified target areas in a 2-day, face-to-face meeting with cross-committee discussions. A refined list of target areas and metrics was then reviewed in-depth within committees and presented to the ECC Committee. The list was further refined over a series of meetings across all subcommittees and the Pediatrics Emphasis Group. Table 1 shows targets across adult and pediatric groups with an approximate 10% to 20% proposed increase in survival goals. Each section also includes action strategies that can be advanced by national, state, and local organizations and through partnerships with the AHA and other stakeholders (Figure 1).

Table 1. American Heart Association Emergency Cardiovascular Care Committee 2030 Impact Goals (Table view)

Area	Goal	Equity
BCPR (adult >18 y)	Increase the rate of BCPR to >50% (2020 CARES: 40.2%)*	The targeted goal rate in underrepresented groups (by sex, gender, race, or ethnicity, as well as other historically underrepresented groups), and in communities with low socioeconomic status, should at least be equal to that of the general population. The targeted population includes residential and public settings and excludes nursing homes.
AED application (adult >18 y)	Increase the proportion of individuals with OHCA in a public setting who have an AED applied before the arrival of EMS to >20% (2020 CARES: 9%)	The targeted goal rate in underrepresented groups (by sex, gender, race, or ethnicity, as well as other historically underrepresented groups), and in communities with low socioeconomic status, should at least be equal to that of the general population.
Survival after OHCA (adult and pediatric)	Increase survival to hospital discharge with good neurologic outcome (CPC 1 or 2) after OHCA, as follows: Adult (>18 y): to >8% at home or residence (2020 CARES: 6.1%);	The targeted goal rate in underrepresented groups (by sex, gender, race, or ethnicity, as well as other historically underrepresented groups), and in communities with low socioeconomic status, should at least be equal to that of the general population.

Area	Goal	Equity
	to >19% in public settings (2020 CARES: 15.7%) Pediatric (<1 y): to >6% after an initial arrest at home or residence (2020 CARES: 5.3%) Pediatric (1–12 y): to >12% in public setting (2020 CARES: 10.9%); to >11.5% after an initial arrest at home or residence (2020 CARES: 10.5%); to >21% in public setting (2020 CARES: 19.2%) Pediatric (13–18 y): to >17.5% after an initial arrest at home or residence (2020 CARES: 16%); to >33% in public setting (2020 CARES: 30%)	
Survival after IHCA	Increase survival to hospital discharge with good neurologic outcome (CPC 1 or 2) after IHCA, as follows: Adult: to >24% (2020 GWTG-R: 16%) Pediatric: to >45% (2015–2019 GWTG-R: 34%–42%)	The targeted goal rate in underrepresented groups (by sex, gender, race, or ethnicity, as well as other historically underrepresented groups), and in communities with low socioeconomic status, should at least be equal to that of the general population.

AED indicates automated external defibrillator; BCPR, bystander cardiopulmonary resuscitation; CARES, Cardiac Arrest Registry to Enhance Survival; CPC, Cerebral Performance Category; EMS, emergency medical services; GWTG-R, Get With the Guidelines–Resuscitation; IHCA, in-hospital cardiac arrest; and OHCA, out-of-hospital cardiac arrest.

* Excludes nursing home events.

Figure 1. **Key stakeholders for advancing American Heart Association efforts to improve cardiac arrest outcomes by 2030.** EMS indicates emergency medical services.

The target areas and metrics listed in Table 1 were developed on the basis of data that are accessible in currently available, robustly managed, longitudinal national databases that report information specifically about OHCA and IHCA. Our committee recognized that advancing process and outcome measures in cardiac arrest will require expansion of these databases or development of new data repositories to include additional information about the multitude of factors that affect cardiac arrest incidence, treatment, and outcomes. In addition to a consistent funding source and governing organization, robust tracking of these measures would require that the data are consistently available, accessible, of high integrity, valid, able to be risk-stratified, and measurable across populations. Table 2 includes aspirational goals for cardiac arrest process and outcome measures that would ideally be available in national databases before or by 2030 to provide greater granularity in tracking and improving the range of factors that affect cardiac arrest. This broader list of targets and populations would enable better benchmarking and broader understanding of where resources should be allocated for improving cardiac arrest outcomes. The AHA is well-positioned to support coordinating existing and future resources and partners to enable data collection and reporting of the areas of focus in the aspirational goals, with a goal of this information being available by 2030.

Table 2. Areas of Focus, Action Strategies, and Aspirational Targets: A Vision for an Optimized Resuscitation Ecosystem in 2030 (Table view)

Areas of focus for aspirational goals	Action strategies	Aspirational targets
Equity, disparities, and racism		
Establishment of cardiac arrest as a reportable disease that must include information about age, sex, gender, race, ethnicity, and socioeconomic data	Develop uniformity of the definition of cardiac arrest; connections between EHR and data from sources such as surveillance systems, public health databases, and EMS; and a robust infrastructure for collecting, validating, and reporting data at local, state, and national levels.	All cardiac arrests are reliably reported in a publicly available national database, with accurate information about age, sex, gender, race, ethnicity, and socioeconomic data.
Screening and prevention	Provide resources to support universal screening for and prevention of cardiovascular disease for individuals and communities.	Access to screening and preventive resources is available throughout the life cycle for all individuals and communities.
Resuscitation training materials	Develop, test, and implement strategies to overcome bias and structural and systemic racism in BLS, ACLS, PBLS, and PALS training materials.	Resuscitation training materials are equitable and free of bias and racism.
Disparities in cardiac arrest care and outcomes	Support research and advocacy to understand needs of high-risk communities and strategies to reduce disparities in care and outcomes. Implement focused efforts and reporting of outcomes to reduce inequities in prehospital and hospital interventions. Ensure equitable access to resources for care after cardiac arrest and recovery for patients and their families and caregivers. Build and support partnerships between AHA and other resuscitation-focused organizations and community and stakeholder organizations to address and eliminate disparities. Deploy and incentivize interventions and implementation programs with demonstrated success at eliminating disparities in cardiac arrest care and outcomes.	Disparities in cardiac arrest care and outcomes are identified and eliminated.
Citizen preparedness and access to resources for effective response to cardiac arrest	Prioritize citizen preparedness, training, and AED access in all communities, with a particular focus on high-risk communities. Encourage donors and philanthropic organizations to support resuscitation resources (ie, CPR & First Aid Anywhere Training Kit, Adult & Child CPR Anytime Kit, and Infant CPR Anytime Kit purchases; sponsored community CPR events; CPR trainings; AED placement) in all communities, with a particular focus on high-risk communities.	Every community has optimized citizen preparedness and access to resources for effective response to cardiac arrest.
Partnerships, advocacy, and engagement	Organize focused efforts by the AHA to identify community and academic partners to engage in ongoing activities to discuss, design, and implement community-based	Schedule annual assemblies of the AHA and other resuscitation-focused organizations specifically to

Areas of focus for aspirational goals	Action strategies	Aspirational targets
	activities to improve cardiac arrest survival rates. Hold AHA-initiated meetings for public and private entities to come together to discuss how to address health inequities in cardiac arrest survival and how to increase survival rates collaboratively in an equitable, just, and timely manner.	address strategies to reduce disparities and improve survival rates.
CPR and AEDs		
Recognition and response	Establish infrastructure to support approaches such as campaigns to increase awareness, universal access to training and evaluation of competency, readily available just-in-time training, and universally accessible devices and technology to help with identifying arrest and providing chest compressions and defibrillation. Provide novel training, approaches, and increased resources to support response and willingness to address cardiac arrest in any location (ie, hospital, public setting, home). Support development and testing of technologies to identify first responders for OHCA (eg, PulsePoint). Secure increased access to AEDs for early defibrillation.	Ensure that every person knows how to recognize cardiac arrest and to respond (eg, call 9-1-1, begin CPR, apply AED) within 1 min. Ensure that 100% of individuals in cardiac arrest receive high-quality CPR within 1 min and AED application within 2 min.
Early detection of unwitnessed and unmonitored cardiac arrest	Support development and testing of technologies (eg, wearables) to improve early detection of unmonitored or unwitnessed SCA.	Realize 50% reduction of unwitnessed and unmonitored cardiac arrests.
CPR quality	Improve quality of CPR delivered (eg, using feedback devices).	Ensure that all CPR delivered is of high quality.
Telecommunicator CPR	Secure universal deployment of telecommunicator CPR for all dispatch systems and data about quality and outcomes.	Confirm that 100% of EMS systems have telecommunicator CPR and that it is provided by dispatch in 100% of relevant cases within 1 min.
CPR and AED training	Organize broad deployment of CPR and AED training at multiple time points and settings (eg, elementary school, high school graduation, DMV encounters, job training, community centers, recreation centers, gyms, religious organizations, supermarkets) and in multimodal delivery systems (eg, in-person, Internet, smartphone applications, text, telephone) to increase population-wide awareness, competence, and willingness to perform. Supply resources (eg, local, state, federal) for population-wide exposure to training, mandates for training at different life intervals,	Ensure that every person (>9 y of age) has received CPR and AED training at different life intervals, through a multitude of venues, and in an accessible, affordable format. Establish CPR training as a requirement for high school graduation. Reach 100% of states requiring CPR training in schools (CPR training in school is required in 38 states as of February 2023).

Areas of focus for aspirational goals	Action strategies	Aspirational targets
	and likely novel personalized delivery modes and training approaches that are easily accessible, just-in-time available, and affordable.	
AED access	Adapt AED design to include features such as location (eg, geomapping capabilities); portability; and integration with existing devices (eg, phones), emergency dispatch systems, and cardiac arrest databases, at a substantially lower price.	Ensure that adapted AEDs are accessible within 1 min in every community.
AED registries	Develop robust, sustainable, and functional AED registries to facilitate measurement and optimization of AED placement, access during an emergency, and centralized coordination of deployment.	Establish that every AED and use of the AED is trackable in an accessible registry.
Research and policy to accelerate CPR delivery and AED use	Support research into novel approaches for increasing CPR delivery. Support development and implementation of research into novel approaches for improved access to early defibrillation for those who experience OHCA in residential settings (eg, community responder models, personal-access defibrillators, unmanned aerial vehicles). Develop forums (eg, summits, task forces, hackathons) to enhance collaboration between health care stakeholders and industry in the development of novel technologies, solutions, and strategies to address known barriers to early defibrillation.	Realize a 10% increase in resuscitation research and tracking of how this research affects CPR delivery and AED use.
In-hospital cardiac arrest		
Early recognition and effective response to patients with acute physiologic decline	Provide improved monitoring for all hospitalized patients. Confirm that systems are in place to triage high-risk patients to hospital wards with monitoring (eg, telemetry, ICU).	Triage 100% of patients to the correct inpatient location with appropriate monitoring. Provide a timely response (within 2 min) to all patients with acute physiologic decline to reduce likelihood of IHCA.
Response to IHCA	Confirm availability of monitoring and a team to respond promptly to all cardiac arrest events. Create and validate a post–cardiac arrest checklist for adult and pediatric patients. Ensure that every eligible patient receives evidence-based high-quality care after cardiac arrest.	Provide high-quality CPR within 1 min and defibrillator application within 2 min in 100% of IHCA cases regardless of time of day, day of week, or hospital area.
Review of IHCA for quality improvement	Establish infrastructure to review every cardiac arrest case (eg, just-in-time) through debriefing sessions (eg, integration of device data, chart review, and audiovisual recordings	Ensure that every cardiac arrest case is evaluated routinely and team members receive feedback, and the

Areas of focus for aspirational goals	Action strategies	Aspirational targets
	of the event) and provide frequent committee review and feedback. Ensure that every hospital has at least 1 dynamic resuscitation champion and a leadership culture that prioritizes IHCA as a reflection of care excellence.	effects of the review and feedback process are tracked over time.
Survival improvement		
Expansion of outcome measures beyond survival	Expand upon care after cardiac arrest to include measures assessing quality of life and functional outcomes after hospital discharge. Initiate standardized reporting of survival outcomes for registries and in clinical trials (eg, COSCA, P-COSCA), in scientific journals (eg, annual AHA Statistical Update, all publications reporting on arrest outcomes), and in the lay press.	Expand cardiac arrest outcomes measures beyond CPC and neurologic outcomes and track, collect, and report (eg, in registries, scientific publications) outcomes measures for every cardiac arrest survivor.
Survivorship	Have survivor communities and support groups for patients, families, caregivers, and responders available and accessible. Provide information about possible physical and emotional effects after cardiac arrest and survivorship, along with available resources, to all survivors of cardiac arrest, families, and caregivers after hospital discharge.	Provide care after cardiac arrest to survivors and their support systems to support their physical and psychologic needs.
Measurement and tracking		
Centers of excellence	Expand existing criteria and measurement for cardiac arrest centers of excellence. Create a recognition or designation program to highlight centers of excellence and encourage regionalization of care.	Ensure that centers of excellence are accessible in every geographic region.
Cardiac arrest process and outcome measures for prehospital systems (eg, EMS), in-hospital systems, and posthospital systems (eg, rehabilitation)	Develop prehospital, in-hospital, and posthospital standardized process and outcome measures that can be collected in existing or new registries for tracking, reporting, and response. Regularly report demographic data on disparities in incidence, treatment, and outcomes in SCA in all communities and high-risk communities in scientific publications (eg, annual AHA Statistical Update) and the lay press.	Ensure that data regarding cardiac arrest process and outcome measures are standardized; available for every arrest; and able to be collected, reported, and responded to.
Resuscitation databases	Increase funding, incentives, and mandates from federal and state partners for comprehensive national, state, and local data collection and reporting as well as quality improvement activities. Increase EMS and hospital membership in registries (eg, GWTG-R, CARES) to optimize geographic and demographic reach. Expand existing registries or create new ones	Have the AHA convene relevant stakeholders to evaluate resource and infrastructure needs to expand existing registries or create new ones to expand uptake and data fields. Require all EMS agencies to submit OHCA data to a

Areas of focus for aspirational goals	Action strategies	Aspirational targets
	to expand reach and capture additional data (eg, OHCA post-ROSC variables, such as WLST and ICD implantation, long-term survivorship, functional measures, quality-of-life data, and outcomes after hospital discharge). Support reporting of outcomes in clinical trials in alignment with resuscitation initiatives (eg, COSCA, P-COSCA).	national registry and receive feedback. Stipulate for all hospitals to submit resuscitation data to a national registry and receive feedback.
Acceleration of resuscitation research	Increase resuscitation science grant funding with a focus on translational and implementation science to identify and disseminate best practices from high-performing EMS agencies and hospitals. Support development and implementation of research into novel approaches for improved access to early defibrillation for individuals who experience OHCA in residential settings (eg, community responder models, personal-access defibrillators, unmanned aerial vehicles).	Increase resuscitation science grant funding by 10% (eg, AHA, NIH, foundations).

ACLS indicates advanced cardiovascular life support; AED, automated external defibrillator; AHA, American Heart Association; BLS, basic life support; CARES, Cardiac Arrest Registry to Enhance Survival; COSCA, Core Outcome Set After Cardiac Arrest; CPR, cardiopulmonary resuscitation; DMV, Department of Motor Vehicles; EMS, emergency medical services; GWTG-R, Get With the Guidelines–Resuscitation; ICD, implantable cardioverter defibrillator; ICU, intensive care unit; IHCA, in-hospital cardiac arrest; NIH, National Institutes of Health; OHCA, out-of-hospital cardiac arrest; PALS, pediatric advanced life support; PBLS, pediatric basic life support; P-COSCA, Pediatric Core Outcome Set After Cardiac Arrest; ROSC, return of spontaneous circulation; SCA, sudden cardiac arrest; and WLST, withdrawal of life-sustaining therapy.

Aligning with the AHA 2024 Goal

An explicit focus of the AHA ECC 2030 priorities is alignment with the AHA 2024 Impact Goal.[4] This specific goal is as follows: "Every person deserves the opportunity for a full, healthy life. As champions for health equity, by 2024, the AHA will advance cardiovascular health for all, including identifying and removing barriers to health care access and quality."[4]

The AHA ECC 2030 Impact Goals (Table 1) directly align with this organizational goal, with a focus on health equity and ensuring that cardiac arrest survival and access to care is equitable for all.

2020: COVID-19 and Equity

The confluence of 2 events in 2020 shaped the time horizon and overarching focus of the 2030 priorities. First, the global COVID-19 (coronavirus disease 2019) pandemic has been a major driver of morbidity and mortality across health conditions, and its effects on cardiac arrest outcomes have been substantial and devastating.[5–7] The practice of resuscitation has been severely affected (eg, delays

and limitations in resuscitation attempts and variability in the implementation of postresuscitation care).[8] Resuscitation guidelines have been continually updated to be responsive to these shifts.[8,9]

Health care professionals had to consider their own risk of contracting COVID-19 in performing all resuscitations and invasive procedures.[10–12] Health care systems had to balance caring for critically ill patients with and without COVID-19, ensuring that health care staff had adequate personal protective equipment and in parallel avoiding COVID-19 transmission to patients with medical emergencies not related to COVID-19 or in need of routine medical care. The COVID-19 pandemic fractured health care systems' capacity to care for patients with conditions not related to COVID-19, with substantial consequences. Early identification of cardiovascular emergencies was challenged when outpatient medical care was moved from in-person clinic settings to telehealth and nonurgent clinic appointments were rescheduled or cancelled. As shelter-in-place orders were adopted by municipalities experiencing COVID-19 surges, emergency medical services (EMS) systems identified a decrease in calls for cardiovascular emergencies and an increase in patients' refusal of transport.[13,14] These factors are important contributors to the excess number of cases of OHCA.[15,16] Whereas COVID-19 has had global repercussions, there are substantial disparities in how hospitals were affected by the COVID-19 pandemic because of the tiered nature of the US health care system, a structure that affects the quality of care received by patients from historically underrepresented racial and ethnic groups.[16–21] The long-term effect that COVID-19 and its sequelae will have on cardiac arrest outcomes and resuscitation remains unknown, but the contribution of hospital-level differences in care and outcomes will need to be further examined. These priorities for the next decade are therefore identified to account for the substantial uncertainty in resuscitation practices and outcomes.

The AHA ECC 2030 priorities were also shaped by a nationwide awakening to the systemic racism present in the United States, highlighted by the murder of George Floyd, and others, by police officers and the visibility of the Black Lives Matter movement. The COVID-19 pandemic also exposed vulnerabilities and biases within the health care system that predated the pandemic and have detrimental effects on how health care systems operate and how health outcomes are affected.[18,22] In addition, the pandemic has led to renewed focus on structural racism being identified as a public health crisis.[19] Overall, the effects of the COVID-19 pandemic have resulted in an unparalleled loss of life, numbering in the millions. These deaths have disproportionately affected Black, Hispanic or Latino, and Indigenous communities and exacerbated health inequities.[20,23,24]

Inequities in workplace safety, technology literacy, language concordance, and access to health care contributed to disproportionate rates of COVID-19 infections, hospitalizations, and deaths in Black, Hispanic or Latino, and other historically excluded people.[25–27] These factors have also been contributors to increased incidence of and lower survival after cardiac arrest in the same communities.[16,28] Considering the substantial disparities (eg, race, ethnicity, sex, gender) that exist in bystander cardiopulmonary resuscitation (BCPR) rates and cardiac arrest outcomes, the writing group and the ECC Committee identified equity as a key focus for evaluating BCPR rates, automated external defibrillator (AED) use, and cardiac arrest outcomes over time.

Priority Area: Equity, Disparities, Racism

Disparities in Care and Outcomes

Cardiac arrest incidence and survival rates vary, depending on factors such as location, race, and ethnicity.[29–33] Black and Hispanic or Latino individuals have a higher incidence of cardiac arrest and a lower chance of surviving with functional neurologic outcome compared with White individuals.[34,35] The incidence of OHCA increases and the likelihood of survival decreases among individuals in lower-income populations.[36–41] BCPR can double to triple chances of survival, but it is less frequently provided to people who have an OHCA in neighborhoods that are predominantly Black, Hispanic or Latino, or low-income.[42–44] Previous reports also support that BCPR may be provided less frequently to women who have experienced cardiac arrest.[45–47] Outcomes after a cardiac arrest also vary widely by hospital, with studies showing that hospitals that provide care for predominantly Black and low-income populations report lower survival rates compared with those that serve higher-income and predominantly White populations.[48] Disparities in rates of cardiac catheterization and provision of targeted temperature management have been identified as potential reasons for sex- or race-related disparities in neurologically favorable survival after cardiac arrest.[49–52]

Racism and Root Causes for Disparities

The underlying causes of disparities in the incidence, treatment, survival, and long-term outcomes of cardiac arrest are complex. The higher incidence and lower survival rates of cardiac arrest in Black, Hispanic or Latino, and other historically excluded people are largely a consequence of structural racism. Defined as the "totality of ways in which societies foster racial discrimination, through mutually reinforcing inequitable systems (eg, housing, education, employment, earnings, benefits, credit, media, health care, criminal justice) that in turn reinforce discriminatory beliefs, values, and distribution of resources," structural racism reinforces and perpetuates health inequities.[53]

Rates of cardiovascular disease vary by race and ethnicity,[2] which may lead to the higher incidence rates of cardiac arrest in individuals who are Black, Hispanic or Latino, or from other underrepresented groups; however, unequal access to preventive health services and screening, delays in diagnosis and treatment, lack of neighborhood-level resources, and unequal access to cardiopulmonary resuscitation (CPR) and AED training opportunities also contribute to worse cardiac arrest outcomes in these populations.[54–61] Inequitable educational and employment opportunities and inequitable distribution of health care infrastructure and services lead to shorter life expectancies in people in some under-resourced zip codes compared with their neighbors a few miles away.[62–64] Despite national cardiac arrest treatment guidelines, not all patients receive evidence-based therapies or care, with people from historically underrepresented racial, ethnic, sex, or gender groups at particularly high risk for undertreatment.[50,52,65–69] In accordance, the AHA and the AHA ECC Committee have included identifying and removing barriers to health equity in their Impact Goals and priorities.[4,70]

To eliminate disparities in cardiac arrest incidence, treatment, and survival, it is imperative to describe and measure how interpersonal, structural, and institutional biases negatively affect the health of historically underrepresented racial and ethnic groups, rural communities, and low-income communities. There is an opportunity to save more lives by prioritizing equitable delivery of lifesaving interventions throughout the Chain of Survival (Figure 2) and including equitable outcomes as a metric of success. This approach also aligns with the AHA's focus on promoting strategies for

addressing structural racism across multiple domains: advocacy, quality improvement, leadership, human resources and business operations, and science (Figure 3).

Figure 2. **Chain of Survival: adult and pediatric out-of-hospital cardiac arrest.** CPR indicates cardiopulmonary resuscitation. Reprinted from Merchant et al[70a] with permission. Copyright © 2020 American Heart Association, Inc.
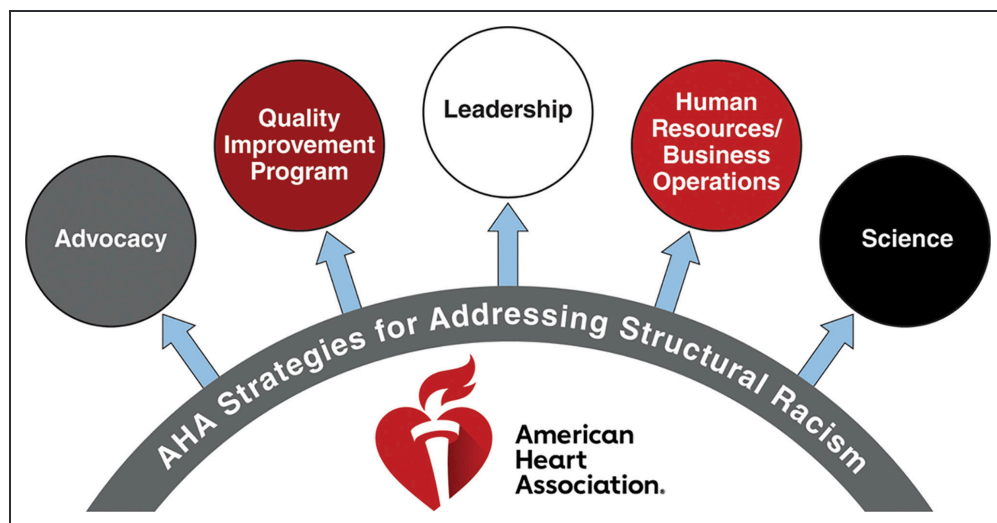

Figure 3. **AHA strategies for addressing structural racism.** AHA indicates American Heart Association. Reprinted from Churchwell et al[18] with permission. Copyright © 2020 American Heart Association, Inc.

Target Priority and Included Populations

In alignment with the AHA's 2024 goals,[4] and in consideration of the persistent disparities in cardiac arrest recognition, treatment, and survival on the basis of race, ethnicity, income, sex, gender, or geographic location (ie, urban, rural), the ECC Committee has included a 2030 Target Priority to eliminate disparities in BCPR, AED use, and survival. The targeted goal rate of BCPR, AED use, and survival in all historically underrepresented groups and communities (eg, owing to sex, gender, race, ethnicity, or socioeconomic status) should at least be equal to that of the general population.

Action Strategies

Action strategies to address disparities (Table 2) need to be centered around identifying barriers to the links of the AHA Chain of Survival to implement targeted plans to strengthen those links. One barrier to tracking progress in outcomes over time is that cardiac arrest is not identified as a reportable condition. Another barrier to achieving health equity is lack of data on underrepresented groups (eg, Indigenous people, Asian individuals). Inconsistency exists in how sex, race, ethnicity, and socioeconomic status data are obtained and reported. Studies may report these data by geographic designation because obtaining individual-level data can be challenging, and self-reporting may not be possible in the setting of cardiac arrest.[71–73]

Addressing the disproportionate burden of cardiac arrest incidence in lower-income and historically underrepresented racial and ethnic groups should start at the societal level, with prevention and screening to identify people at risk of cardiovascular disease or cardiac arrest. Resuscitation training materials could raise awareness of inequities by including information for end users about historical and current disparities in practice and outcomes for historically underrepresented groups (eg, owing to race, ethnicity, sex, gender, or socioeconomic status). Moreover, strategies to increase community response must address structural barriers to activating EMS response, such as language competency and mistrust of first responders.[74] Individuals trained in basic and advanced life support must recognize and address implicit structural and systemic bias to reduce inequities in EMS and hospital interventions. In addition, there is a need for equal access to resources for care and recovery after cardiac arrest.

Priority Area: BCPR

OHCA is associated with low survival, but early CPR and early defibrillation can improve outcomes.[75,76] Approximately 70% of cardiac arrests occur outside of the hospital setting, where the link for early CPR in the AHA Chain of Survival often lies in the hands of lay rescuers. BCPR has been shown in multiple studies to improve OHCA survival and can double or triple the odds of survival in OHCA.[37,38,77,78] BCPR is only performed in an estimated 40% of US individuals in cardiac arrest, with lower rates in Black, Hispanic or Latino, and other historically underrepresented racial and ethnic groups.[38,40] People living in primarily low-income neighborhoods or in neighborhoods with predominantly Black or Hispanic or Latino residents are more likely to have OHCA and are less likely to receive BCPR.[41,42] For example, in a study[79] using the CARES database (Cardiac Arrest Registry to Enhance Survival), Hispanic or Latino residents of Los Angeles received BCPR at approximately half the rate of White residents. Contributing factors to low rates of BCPR include limited access to knowledge about training, fear of making a mistake, fear of disease transmission (which has

increased since the onset of the COVID-19 pandemic), and liability concerns.[74,80,81] Language barriers and associated challenges attributable to limited English-language proficiency in 9-1-1 callers during dispatcher-identified cardiac arrest are also associated with less frequent BCPR, as well as delays in both cardiac arrest recognition and implementation of telephone-assisted CPR.[66,82,83]

Annual rates of CPR training in the United States vary widely across communities, with counties located in the South and those with higher proportions of rural areas, higher proportions of Black and Hispanic or Latino residents, or lower median household incomes having lower rates of CPR training than other communities.[55,84]

Previous work has focused on community-based programs to increase knowledge awareness and action in neighborhoods.[85–87] One such program was highlighted in a study of 2 cities in Texas, which demonstrated how a geographically targeted CPR training strategy tailored to neighborhood population characteristics may be effective in reducing disparities in BCPR for OHCA.[56] High-risk neighborhoods (ie, neighborhoods comprising predominantly low-income residents and historically underrepresented ethnic and racial groups) can be identified and CPR training targeted in neighborhoods in which it is most likely to be needed.[39,40,43,44,58] Incentives and support for new training modalities and digital platforms, such as virtual training, Resuscitation Quality Improvement programs, and CPR kiosks, may be able to enhance CPR education and response.[88,89] Recognizing the importance of community involvement in a cardiac arrest program and developing a CPR training program that takes into consideration the uniqueness of each community's barriers and opportunities can help support implementation of targeted programs focused on education[90] and increasing awareness. Training programs should not only include the mechanics of BCPR but also address community concerns regarding accessing emergency services and preventing disease transmission, especially in the context of the COVID-19 pandemic. Continued focus on CPR training as a requirement for high school graduation or in other settings, such as when obtaining a driver's license, represent additional strategies for increasing training.[91] Targeted efforts focused on high-risk communities have the potential to improve overall BCPR rates while reducing health disparities in the prevention, recognition, and treatment of cardiac arrest.

Target Priority and Included Populations

The ECC 2030 Target Priority is to increase the rate of BCPR to >50% (versus the 2020 CARES goal of 40.2%) by the end of 2030. The targeted goal rate in underrepresented groups (by sex, gender, race, or ethnicity, as well as other historically underrepresented groups), and in communities with low socioeconomic status, should at least be equal to that of the general population.

Action Strategies

Action strategies to improve BCPR (Table 2) must address barriers to CPR training and performance, include more robust data collection to improve outcomes, and identify and target training in broader settings (eg, requirement for high school graduation) and communities of highest need to reduce disparities and increase rates of BCPR in all neighborhoods, regardless of race, ethnicity, geography, or socioeconomic status.

Priority Area: Early Access Defibrillation for OHCA

Ventricular fibrillation and pulseless ventricular tachycardia are amenable to defibrillation but deteriorate to nonshockable rhythms over time. The probability of survival from cardiac arrest decreases for every minute defibrillation is delayed.[92,93] Early defibrillation in conjunction with chest compressions is associated with markedly improved survival for people who experience cardiac arrest.[94,95] The median time from 9-1-1 call to scene arrival for EMS responding to OHCA is >6 minutes in North America, even in dense urban settings.[96] Given these system limitations, use of AEDs as soon as possible by people at the scene is a critical component of the Chain of Survival and a key strategy to optimize outcomes after OHCA. Most contemporary AEDs provide prompts to guide users through the process of CPR, with some even providing real-time feedback on quality.

Despite the proliferation of public-access defibrillation programs, many barriers to early defibrillation for individuals in cardiac arrest remain.[97] Overall, fewer than 10% of people in cardiac arrest have an AED applied before EMS arrival.[95,96] AEDs are more likely to be used in public settings compared with private residential settings (15.3% versus 1.3%).[98] This is a critical issue because ≈80% of all OHCAs occur in a residential setting.[95] Although shockable rhythms are observed less often in cardiac arrests in residential locations, the potential population health benefit of early detection and defibrillation for OHCA occurring in residential settings could be substantial.[99] A specific focus on early defibrillation (and not just public-access defibrillation) would enable a broader focus on defibrillation across multiple settings where cardiac arrest occurs and substantial improvements in outcomes could occur with targeted strategies in these nonpublic areas (eg, home, offices, clubs, industrial areas).

Access to AEDs and early defibrillation is not uniform.[100–106] AEDs require a substantial upfront investment to acquire and install the equipment. There are also costs associated with training potential users and ongoing maintenance. Evidence suggests that there are fewer public-access AEDs in low-income neighborhoods compared with higher-income neighborhoods.[107] AEDs are used less often during cardiac arrests occurring in neighborhoods with lower socioeconomic status.[108] Women who experience OHCA in a public location are less likely than men to receive bystander AED use.[109] Hispanic or Latino residents were reported to be less likely than White or Black residents to have received AED training.[59] Future work is required to understand the systemic and contextual factors contributing to inequity in access to early defibrillation so that effective, targeted solutions can be implemented.

Target Priority and Included Populations

The ECC 2030 Target Priority is to increase the proportion of individuals with OHCA who have an AED applied before the arrival of EMS in a public setting to 20% (versus the 2020 CARES goal of 9.0%). The targeted goal rate in underrepresented groups (by sex, gender, race, or ethnicity, as well as other historically underrepresented groups), and in communities with low socioeconomic status, should at least be equal to that of the general population.

Action Strategies

Action strategies to increase early defibrillation (Table 2) focus on improving AED awareness and competency, removing barriers to immediate access and retrieval during an emergency, and supporting the implementation and study of innovative technologies and strategies for early defibrillation in OHCA. Although some overlap may exist, the strategies for improving access to early defibrillation for OHCA will differ for public and residential settings (where most OHCAs occur). To make substantial improvements in early defibrillation for those who experience OHCA in a residential setting, a rethinking of the public-access defibrillation model is required and may require specific targets and strategies. Innovative technology facilitating the development of lightweight, compact, consumer-grade AEDs could support a new paradigm of personal-access defibrillation, whereby devices are easily and regularly carried like cell phones or worn like watches. New vectors of AED delivery, including AED-equipped community volunteers dispatched in parallel with professional responders and unmanned aerial vehicles equipped with AEDs, offer new approaches requiring evaluation.[110,111]

Priority Area: Improve Survival

Cardiac Arrest Outcomes

From 2000 to 2010, there was notable improvement in survival rates for both IHCA and OHCA. For IHCA, risk-adjusted rates of survival to discharge increased from 13.7% to 22.3%, with parallel improvements in survival for shockable cardiac arrest rhythms (<30% in 2000 to ≈40% in 2010) and nonshockable cardiac arrest rhythms (7%–10% in 2010–2011 to 11%–13% in 2009–2010).[112] A similar pattern was observed for OHCA, with overall rates of survival to discharge increasing from 5.7% in 2005 to 2006 to 8.3% in 2012, with parallel improvements in both rhythm types. More recently, IHCA survival has improved to ≈24% in 2016 to 2019, and OHCA survival has improved to ≈10%.[113]

A unique challenge that has emerged is the effect of the COVID-19 pandemic on cardiac arrest response and survival outcomes. Initial analyses from the CARES and Get With the Guidelines–Resuscitation (GWTG-R) registries have detected dramatic decreases in OHCA and IHCA survival.[6,114,115] It will be critical to reassess the 2030 survival targets described in this article on the basis of whether survival rates rebound to prepandemic levels in the near future.

Most efforts at improving cardiac arrest survival have focused on acute resuscitation management, whether inside or outside the hospital. GWTG-R has developed an awards recognition infrastructure to elevate hospitals with superior process-of-care adherence when the patient is pulseless (ie, in timely defibrillation for shockable arrest rhythms or timely administration of epinephrine for nonshockable arrest rhythms).[116]

For OHCA, efforts focused on increasing rates of BCPR, EMS response time, and widespread deployment of AEDs has made, and will continue to make, substantial inroads in improving acute resuscitation response and ultimately survival.[117] Additional work on identifying best practices in postresuscitation care will be critical, especially as research into early percutaneous interventions, extracorporeal cardiopulmonary resuscitation, targeted temperature management and fever avoidance, and other strategies evolves.[118] A recognition program for high-performing EMS agencies with the highest rates of survival to hospital admission in an entity such as CARES may catalyze

innovations and quality improvement in prehospital care. In addition, identifying best practices for OHCA at top-performing EMS agencies that care for predominantly Black or Hispanic or Latino individuals and for IHCA at hospitals that care for predominantly Black or Hispanic or Latino patients, as well as how these sites overcame barriers unique to these communities, is a health equity priority to begin narrowing the race and ethnicity gaps in survival outcomes.

Because variability exists in CPR training, provision, and outcomes by sex and gender, there is an important need to focus on strategies to address inequities in this realm.[46,47]

Previous work has focused primarily on survival and neurologic outcomes, but functional outcomes and longer-term outcomes after hospital discharge also need to be addressed. Existing reporting recommendations (eg, the COSCA [Core Outcome Set After Cardiac Arrest] and P-COSCA [Pediatric COSCA] initiatives) could be required for reporting trial outcomes to further support how data from clinical trials are incorporated in future Impact Goals.[119,120] An important focus for 2030 will be uniformly reported data from clinical trials, registries, and infrastructure to collect and track longer-term outcomes of cardiac arrest survivors with a focus on survivorship, quality of life, and physical and psychosocial wellbeing.

Target Priority and Included Populations

The ECC 2030 Target Priority is to increase survival to hospital discharge with good neurologic outcome (Cerebral Performance Category 1 or 2) after OHCA in a residential or public setting, as follows:

- In adults: >12% (2020 CARES, 7.1%)

- In children <1 year of age: to 6% after an initial arrest at home or residence (2020 CARES, 5.3%) and to 12% in a public setting (2020 CARES, 10.9%)

- In children 1 to 12 years of age: to 11.5% after an initial arrest at home or residence (2020 CARES, 10.5%) and to 21% in a public setting (2020 CARES, 19.2%)

- In children 13 to 18 years of age: to 17.5% after an initial arrest at home or residence (2020 CARES, 16%) and to 33% in a public setting (2020 CARES, 30%)

The ECC 2030 Target Priority is to increase survival to hospital discharge with good neurologic outcome (Cerebral Performance Category 1 or 2) after IHCA, as follows:

- In adults: >24% (2020 GWTG-R, 16%)

- In children: >45% (2015–2019 GWTG-R, 34%–42%)

The AHA ECC 2030 Impact Goals rate in underrepresented groups (by sex, gender, race, or ethnicity, as well as other historically underrepresented groups), and in communities with low socioeconomic status, should at least be equal to that of the general population.

Action Strategies

Action strategies to address improving survival after cardiac arrest (Table 2) can be centered around approaches to detect decompensating patients early, improve data collection and registries to add to our current understanding of risks and outcomes, and provide optimal care after cardiac arrest, with a focus on survivorship and quality of life after hospital discharge. Early detection of clinical decompensation with early warning scores in the inpatient setting could theoretically improve

outcomes; although, thus far, data have been inconclusive. The many different scoring systems use different definitions of end points, use different algorithms of data analysis, and have undergone different validation, which make comparing scores and implementing processes challenging.[121–123] In both the inpatient and out-of-hospital setting, process optimization (eg, decreasing time to defibrillation or epinephrine administration, increasing BCPR rates, expanding public-access AEDs) are all integral to improving survival.

By identifying hospital systems, EMS agencies, and communities that achieve excellent outcomes, subsequent qualitative investigation can begin to reveal how their outcomes differ.[124,125] This work will be incumbent upon increased funding and resource allocation at multiple levels for resuscitation science.

Priority Area: Measurement and Tracking

The key to quality improvement is measurement, tracking, and assessment of how specific interventions affect health outcomes. The 2 main registries in this regard are CARES[126] and GWTG-R.[127] CARES is used primarily to capture dispatcher, prehospital, and hospital data on OHCA, whereas GWTG-R is primarily used for IHCA, and participants can access their own data and benchmark for quality improvement purposes. CARES releases a summary annual report. GWTG-R data are primarily shared through periodic research publications, an annual report of each hospital's risk-standardized survival rate for IHCA, and an awards program for benchmarking resuscitation processes of care. The 2020 CARES data included 1741 EMS agencies and 1962 hospitals with a catchment area representing ≈44% of the US population (143.5 million people). In 2020, 127 376 treated OHCAs were included with a crude incidence of 88.8 treated arrests per 100 000 population. Unpublished CARES data on cardiac arrest differences by age, race, ethnicity, and sex are presented in Tables 3 and 4 (personal communication, Dr Bryan McNally, Principal Investigator for CARES, January 2023).

Table 3. Differences in Bystander Interventions and Survival After OHCA by Race, Ethnicity, and Sex, Adult (Age >18 Years), CARES, 2021 (Table view)

Groups	Nontraumatic cause survival rates, overall survival to hospital discharge	Bystander intervention rates	
		CPR*	Public AED use†
Total‡	12 996/143 284 (9.1)	43 048/107 782 (39.9)	1704/16 747 (10.2)
American Indian/Alaska Native	38/510 (7.5)	161/411 (39.2)	8/88 (9.1)
Asian	318/3572 (8.9)	1199/2828 (42.4)	33/386 (8.5)
Black/African American	2471/30 805 (8.0)	7288/22 011 (33.1)	282/3247 (8.7)
Hispanic or Latino	996/12 134 (8.2)	3640/9520 (38.2)	119/1584 (7.5)
Native Hawaiian/Pacific Islander	72/772 (9.3)	299/621 (48.1)	4/84 (4.8)

Groups	Nontraumatic cause survival rates, overall survival to hospital discharge	Bystander intervention rates	
		CPR*	Public AED use†
White	7101/72 073 (9.9)	22 760/54 269 (41.9)	975/8376 (11.6)
Unknown	2000/23 418 (8.5)	7701/18 122 (42.5)	283/2982 (9.5)
Male	8413/89 743 (9.4)	27 909/69 480 (40.2)	1384/13 115 (10.6)
American Indian/Alaska Native	23/284 (8.1)	91/232 (39.2)	5/56 (8.9)
Asian	238/2207 (10.8)	738/1773 (41.6)	26/308 (8.4)
Black/African American	1399/17 376 (8.1)	4156/12 729 (32.6)	213/2418 (8.8)
Hispanic or Latino	678/7998 (8.5)	2437/6458 (37.7)	104/1301 (8.0)
Native Hawaiian/Pacific Islander	44/482 (9.1)	197/399 (49.4)	3/65 (4.6)
White	4704/46 362 (10.1)	15 202/35 999 (42.2)	809/6627 (12.2)
Unknown	1327/15 034 (8.8)	5088/11 890 (42.8)	224/2340 (9.6)
Female	4578/53 496 (8.6)	15,129/38 270 (39.5)	320/3628 (8.8)
American Indian/Alaska Native	15/226 (6.6)	70/179 (39.1)	3/32 (9.4)
Asian	80/1363 (5.9)	459/1053 (43.6)	7/78 (9.0)
Black/African American	1071/13 419 (8.0)	3132/9276 (33.8)	69/829 (8.3)
Hispanic/Latina	317/4133 (7.7)	1202/3060 (39.3)	15/283 (5.3)
Native Hawaiian/Pacific Islander	28/290 (9.7)	102/222 (45.9)	1/19 (5.3)
White	2394/25 694 (9.3)	7555/18 259 (41.4)	166/1747 (9.5)
Unknown	673/8371 (8.0)	2609/6221 (41.9)	59/640 (9.2)

Values are n/N (%).

OHCA indicates out-of-hospital cardiac arrest.

* Bystander cardiopulmonary resuscitation (CPR) rate excludes 9-1-1 responder witnessed, nursing home, and health care facility arrests.

† Public automated external defibrillator (AED) use rate excludes 9-1-1 responder witnessed, home or residence, nursing home, and health care facility arrests.

‡ Sex missing for 45 individuals.

Source: Personal communication, Dr Bryan McNally, Principal Investigator for Cardiac Arrest Registry to Enhance Survival (CARES), January 2023. Used with permission.

Table 4. Differences in Bystander Interventions and Survival After OHCA by Race, Ethnicity, and Sex, Pediatric (Age ≤18 Years), CARES, 2021 (Table view)

Groups	Age <1 y* Nontraumatic cause survival rates, overall survival to hospital discharge	Bystander intervention rates CPR†	Public AED use‡	Age 1–12 y Nontraumatic cause survival rates, overall survival to hospital discharge	Bystander intervention rates CPR†	Public AED use‡	Age 13–18 y Nontraumatic cause survival rates, overall survival to hospital discharge	By... int... Cl...
Total§	388/6499 (6.0)	2872/6227 (46.1)	8/410 (2.0)	634/4205 (15.0)	2003/3876 (51.7)	43/561 (7.7)	544/2959 (18.4)	13 (4
American Indian/Alaska Native	3/31 (9.7)	13/31 (41.9)	0/3 (0.0)	4/16 (25.0)	9/16 (56.2)	0/4 (0.0)	2/13 (15.4)	7/ (5
Asian	12/115 (10.4)	46/100 (46.0)	0/9 (0.0)	9/88 (10.2)	44/80 (55.0)	1/17 (5.9)	16/61 (26.2)	34 (6
Black/African American	120/2380 (5.0)	923/2296 (40.2)	0/113 (0.0)	165/1348 (12.2)	530/1231 (43.1)	15/191 (7.9)	108/738 (14.6)	25 (3
Hispanic or Latino	34/647 (5.3)	254/616 (41.2)	0/47 (0.0)	91/549 (16.6)	231/500 (46.2)	7/65 (10.8)	79/437 (18.1)	17 (4
Native Hawaiian/Pacific Islander	1/43 (2.3)	16/42 (38.1)	0/2 (0.0)	4/31 (12.9)	18/30 (60.0)	0/6 (0.0)	5/22 (22.7)	11 (5
White	149/2065 (7.2)	1029/1973 (52.2)	5/154 (3.2)	217/1391 (15.6)	790/1297 (60.9)	14/156 (9.0)	237/1153 (20.6)	58 (5
Unknown	69/1218 (5.7)	591/1169 (50.6)	3/82 (3.7)	144/782 (18.4)	381/722 (52.8)	6/122 (4.9)	97/535 (18.1)	25 (5
Male	266/3735 (7.1)	1657/3585 (46.2)	4/240 (1.7)	388/2445 (15.9)	1174/2246 (52.3)	24/343 (7.0)	373/1863 (20.0)	84 (4
American Indian/Alaska Native	2/15 (13.3)	9/15 (60.0)	0/2 (0.0)	3/9 (33.3)	4/9 (44.4)	0/3 (0.0)	1/9 (11.1)	4/
Asian	9/65 (13.8)	26/58 (44.8)	0/5 (0.0)	7/50 (14.0)	26/45 (57.8)	0/10 (0.0)	11/37 (29.7)	20 (6
Black/African American	79/1335 (5.9)	508/1292 (39.3)	0/60 (0.0)	99/760 (13.0)	282/681 (41.4)	7/111 (6.3)	85/474 (17.9)	16 (4
Hispanic or Latino	25/374 (6.7)	148/356 (41.6)	0/25 (0.0)	50/308 (16.2)	132/280 (47.1)	5/45 (11.1)	53/279 (19.0)	11 (4
Native Hawaiian/Pacific Islander	0/28 (0.0)	10/27 (37.0)	0/2 (0.0)	3/15 (20.0)	8/14 (57.1)	0/3 (0.0)	2/12 (16.7)	6/ (5
White	109/1226 (8.9)	618/1176 (52.6)	1/94 (1.1)	132/813 (16.2)	482/760 (63.4)	7/93 (7.5)	155/723 (21.4)	37 (5
Unknown	42/692 (6.1)	338/661 (51.1)	3/52 (5.8)	94/490 (19.2)	240/457 (52.5)	5/78 (6.4)	66/329 (20.1)	16 (5
Female	122/2759 (4.4)	1214/2637 (46.0)	4/169 (2.4)	246/1760 (14.0)	829/1630 (50.9)	19/218 (8.7)	171/1096 (15.6)	47 (4

Groups	Age <1 y* Nontraumatic cause survival rates, overall survival to hospital discharge	Bystander intervention rates CPR†	Public AED use‡	Age 1–12 y Nontraumatic cause survival rates, overall survival to hospital discharge	Bystander intervention rates CPR†	Public AED use‡	Age 13–18 y Nontraumatic cause survival rates, overall survival to hospital discharge	By int Cl
American Indian/Alaska Native	1/16 (6.2)	4/16 (25.0)	0/1 (0.0)	1/7 (14.3)	5/7 (71.4)	0/1 (0.0)	1/4 (25.0)	3/
Asian	3/49 (6.1)	19/41 (46.3)	0/4 (0.0)	2/38 (5.3)	18/35 (51.4)	1/7 (14.3)	5/24 (20.8)	14 (7
Black/African American	41/1045 (3.9)	415/1004 (41.3)	0/53 (0.0)	66/588 (11.2)	248/550 (45.1)	8/80 (10.0)	23/264 (8.7)	89 (3
Hispanic or Latina	9/272 (3.3)	106/259 (40.9)	0/22 (0.0)	41/241 (17.0)	99/220 (45.0)	2/20 (10.0)	26/158 (16.5)	64 (4
Native Hawaiian/Pacific Islander	1/15 (6.7)	6/15 (40.0)	0/0 (0.0)	1/16 (6.2)	10/16 (62.5)	0/3 (0.0)	3/10 (30.0)	5/ (5
White	40/838 (4.8)	411/796 (51.6)	4/60 (6.7)	85/578 (14.7)	308/537 (57.4)	7/63 (11.1)	82/430 (19.1)	21 (5
Unknown	27/524 (5.2)	253/506 (50.0)	0/29 (0.0)	50/292 (17.1)	141/265 (53.2)	1/44 (2.3)	31/206 (15.0)	89 (4

Values are n/N (%).

OHCA indicates out-of-hospital cardiac arrest.

* Stillborn neonates and perinatal newborns born without signs of life are excluded.

† Bystander cardiopulmonary resuscitation (CPR) rate excludes 9-1-1 responder witnessed, nursing home, and health care facility arrests.

‡ Public automated external defibrillator (AED) use rate excludes 9-1-1 responder witnessed, home or residence, nursing home, and health care facility arrests.

§ Sex missing for 5 individuals (<1 y age category).

Source: Personal communication, Dr Bryan McNally, Principal Investigator for Cardiac Arrest Registry to Enhance Survival (CARES), January 2023. Used with permission.

An important challenge in achieving the AHA ECC 2030 Impact Goals is that nationally representative data are either incomplete or not publicly available at the national, state, and local levels. The specific metrics for tracking cardiac arrest process and outcome measures should also evolve as new data become available. Reports that are publicly available lack adequate granularity on analyses for purposes of health equity, especially as they pertain to geographic location and neighborhood-level characteristics. The ability to access these data at a community level will be key in planning and implementing interventions where they are most likely to have the greatest effect.

Major advances in cardiac arrest research are often driven by data. Results from clinical trials often drive major advances in cardiac arrest care and outcomes. However, inconsistencies exist in how data are reported from these studies, sometimes limiting their comparability or generalizability. Existing reporting recommendations (eg, COSCA and P-COSCA initiatives) should be required for reporting trials outcomes, which could further support how data from clinical trials are incorporated in future Impact Goals.[119],[120]

A barrier to expansion of both CARES and GWTG-R is lack of funding. The registries are voluntary and supported by philanthropic sources (eg, the AHA) or by subscription fees by the participating agencies, states, or hospital systems. A more stable funding stream to cover costs for participating sites and statistical support will be essential to the continued success of capturing and providing feedback data for OHCA and IHCA.

In addition to increasing enrollment, the measures in these registries should be expanded to allow for tracking and measurement of aspirational areas of focus and targets (Table 2), or complementary registries should be resourced and implemented that allow for tracking these measures to achieve an optimized resuscitation ecosystem in the near future. Another barrier is that reporting on cardiac arrest incidence, process measures, and outcomes is not mandatory or incentivized. If cardiac arrest were classified as a reportable disease (eg, by the Council of State and Territorial Epidemiologists), uniform reporting by all states would be mandated. As an alternative, data collection and reporting could be incentivized by linking it to health care system certifications or reimbursement.

Collaboration across key stakeholder groups is also paramount to the success of this initiative. The Chain of Survival is uniquely dependent on multiple links, which require coordinated efforts from the community, dispatchers, prehospital health care professionals, health care systems, patients, and their caregivers to improve outcomes after cardiac arrest.

Action Strategies

The action strategies outlined in Table 2 address barriers to measurement and tracking of OHCA process measures, outcomes, and equity. These strategies require engagement and resources at the national, state, and local government levels, as well as participation of all stakeholders in the local systems of care, including members of the health care team, patients, and their families.

Pediatric Perspective

Whereas this document applies to the population at large, including children, there are some differences that warrant highlighting for the pediatric population. There are disparities in treatment and outcomes for children experiencing cardiac arrest.[67,108,128,129] Naim et al[130] reported that BCPR was provided in 46.5% of pediatric OHCA arrests and that an AED was not used in 82.6% of pediatric OHCAs, which is comparable to adult OHCA data.

Children who are the recipients of BCPR and who have placement of an AED in OHCA are far more likely to be White and from neighborhoods with higher education and income levels.[108,129,130] Survival, however, does not seem to be different among races in both IHCA and OHCA.[67,131] The investigators of these studies hypothesized that this may be attributable to both the expansion of pediatric insurance coverage and the broad reach of major academic hospitals in caring for pediatric patients. However, much of the difference in pediatric cases stems from the predominance of a respiratory cause of cardiac arrest. An alternative approach of compression-only CPR, suggested as an option for bystanders who witness OHCA, has not been shown to be as effective as conventional compressions with breaths in pediatric patients.[124,130] This likely is because of the respiratory cause underlying many pediatric arrests and the need for rescue breaths. A large component of pediatric arrests occur in infants, at home, and are unwitnessed, likely associated with sudden infant death

syndrome.[124] A different approach is needed to improve these outcomes, with focus on prevention of known risk factors, research to clarify pathogenesis, and education and training in conventional CPR for families and caregivers of young children. A continued focus on rigorous data to guide pediatric resuscitation practices for OHCA and IHCA would also be beneficial.

Conclusions

These goals for 2030 were developed during an extraordinary time. Global events that occurred while the deliberations for this article were taking place included a worldwide pandemic responsible for >5.5 million deaths (as of January 2022), substantial economic stress throughout major segments of the business world, incidents leading to a sharp focus on racism and inequality, and the expectation that climate change will soon emerge as the largest global threat to human health, along with acutely worsening metrics on cardiovascular health and diminished survival rates in nearly every community. The authors debated all these issues in an attempt to provide goals that balanced the need to improve cardiovascular health and survival rates against the many ongoing additional pressing issues faced by our communities during a stressful period in our history.

The AHA ECC 2030 Impact Goals are intended to reflect our optimism for improvement grounded in a pragmatic foundation of what is realistic given current conditions and serve as an achievable road map for improved cardiovascular health and better survival rates in all communities. The themes presented harmonize with the new goals of the AHA to create a world where every person can lead a full, healthy life, and reflect our ongoing struggles to contain the COVID-19 pandemic. There is an increasing recognition of the need to provide more equitable care, identify disparities and structural inequity, and create better systems of care that will remove the ongoing inequitable systems that perpetuate disparities. New proposed metrics will allow us to document our progress in resolving disparities. We seek to extend the effects of the interventions that we know to be effective. Improving the rates of BCPR and advancing the coverage of AEDs to provide more rapid defibrillation serve as a foundation. Collecting critical data on important metrics such as rates of BCPR, use of AEDs, and survival rates allow us to delve into the issues causing disparities while improving care for everyone.

Working to achieve the AHA ECC 2030 Impact Goals will advance our response to cardiac arrest, engage all our communities in promoting better public health, and advance the goal of ensuring that all people lead the fullest and healthiest life possible.

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This table represents the relationships of writing group members that may be perceived as actual or reasonably perceived conflicts of interest as reported on the Disclosure Questionnaire, which all members of the writing group are required to complete and submit. A relationship is considered to be "significant" if (a) the person receives $5000 or more during any 12-month period, or 5% or more of the person's gross income; or (b) the person owns 5% or more of the voting stock or share of the entity, or owns $5000 or more of the fair market value of the entity. A relationship is considered to be "modest" if it is less than "significant" under the preceding definition.

* Modest.

† Significant.

Reviewer Disclosures

Reviewer	Employment	Research grant	Other research support	Speakers' bureau/honoraria	Expert witness	Ownership interest	Consultant/adv board
Dianne L. Atkins	University of Iowa	None	None	None	None	None	None
Allan deCaen	University of Alberta (Canada)	None	None	None	None	None	None
Jonathan P. Duff	University of Alberta and Stollery Children's Hospital (Canada)	None	None	None	None	None	None
Vinay M. Nadkarni	Children's Hospital of Philadelphia, University of Pennsylvania Perelman School of Medicine	Zoll Medical (research grant to institution)†; Laerdal Foundation (research grant to institution)†; Nihon Kohden Corporation (research grant to	None	None	None	None	None

Reviewer	Employment	Research grant	Other research support	Speakers' bureau/honoraria	Expert witness	Ownership interest	Consultant/advisory board
		institution)†; RQI Partners (research grant to Institution)†; Philips Medical; Defibtech (research grant to institution)*; HeartHero (research grant to institution)*; Nicoletti Family Philanthropy (unrestricted grant to institution)†; NIH (P-ICECAP [Pediatric Influence of Cooling Duration on Efficacy in Cardiac Arrest Patients; Co-I])†; NIH (ICU-RESUS [Improving Outcomes from Pediatric Cardiac Arrest: the ICU-Resuscitation Project; Co-I])†					
Tia T. Raymond	Medical City Children's Hospital	Children's Heart Foundation†	None	None	None	None	New England Research Institutes, Inc*

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or more of the voting stock or share of the entity, or owns $5000 or more of the fair market value of the entity. A relationship is considered to be "modest" if it is less than "significant" under the preceding definition.

* Modest.

† Significant.

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