



**“CPR & AED Training in Low Income Neighborhoods  
Comprised of Ethnic Minorities in Elizabeth, NJ”**

**By Romulo A. Meneses**

**The Undergraduate Research Writing Conference**

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**Rutgers, The State University of New Jersey**

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December 11, 2019

Gail K. Boudreaux  
President and CEO  
Anthem Foundation  
220 Virginia Ave  
Indianapolis, IN 46204

**Re: CPR and AED Training in Low Income Neighborhoods Comprised of Ethnic Minorities in Elizabeth, New Jersey**

Dear Ms. Boudreaux,

Firstly, I want to take this opportunity to thank you for taking the time to come to my presentation at Rutgers University in New Jersey. The Anthem Foundation has a long legacy of providing funding and support for initiatives that promote the healthy living of individuals and communities across the country. You do this through partnerships with organizations that share your vision such as the American Heart Association and the American National Red Cross. In 2017 your foundation very generously donated 1.4 million dollars to the American Heart Association (AHA) for various CPR training programs that fall in line with my proposal today.

My plan focuses on CPR training in the Elizabethport neighborhood of Elizabeth, NJ. Elizabeth is New Jersey's fourth largest city with an approximate population of 128,000 as of July of 2018 (U.S. Census Bureau, 2018). Elizabethport is a neighborhood with one of the lowest household income averages in the country (U.S. Census Bureau, 2018). Current research notes that the incidences of out of hospital cardiac arrests are higher in low socioeconomic communities by nearly double (Reinier et al., 2011), and one NYC study found that survival to hospital discharge was lower amongst black people and Hispanics when compared to whites (Galea et al., 2007). The single highest contributing factor to hospital discharge after an out of hospital cardiac arrest was layperson CPR & Automated External Defibrillator (AED) usage (Girotra et al., 2016). Despite this, CPR training rates are lower in counties with a high proportion of black and Hispanic residents, people with less formal education, and lower income groups (Anderson et al., 2014; Blewer et al., 2017). I invite you to join me in this journey to help the people of Elizabeth, NJ improve their livelihoods for generations to come through CPR training.

If you have any questions or concerns, I can be contacted at [rm769@scarletmail.rutgers.edu](mailto:rm769@scarletmail.rutgers.edu) or at (908) 230-2292. Thank you for taking the time to review my proposal.

Sincerely,

Romulo A. Meneses

# **CPR & AED Training in Low Income Neighborhoods Comprised of Ethnic Minorities in Elizabeth, NJ**



Source: ("CPR is key to survival of sudden cardiac arrest", 2018)

**Submitted to:**

Gail K. Boudreaux  
President and CEO  
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220 Virginia Ave  
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**Date:** December 11, 2019

Final Proposal for Scientific and Technical Writing Section 29

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## **Abstract**

Incidences of out-of-hospital cardiac (OHCA) arrest are higher in low socioeconomic communities by nearly double, and in some regions the highest incidences of OHCA were amongst black people and Hispanics as compared to whites. Survival to hospital discharge from OHCA ranges from 10.4% -11.4% across all demographics, but one NYC study found that survival to hospital admission was lower for black people (6.0%) and Hispanics (8.6%) compared to whites (11.3%). Layperson CPR and Automated External Defibrillator (AED) use was the single highest contributing factor to hospital discharge after OHCA, yet training rates are lower in counties with a high proportion of black and Hispanic residents, people with less formal education, and lower income groups. Not only are the CPR training rates lower amongst this population, but several studies have found that there is an overall hesitation to start CPR in these communities as well. The low CPR training rates and overall hesitancy to initiate life-saving measures must be addressed in order to increase the long-term health and life expectancy of the people that compose these neighborhoods.

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## Introduction

### *Out-Of-Hospital Cardiac Arrest: Overview*

Out-of-hospital cardiac arrest (OHCA) is the cessation of all cardiac activity causing death. This can be caused by a variety of medical reasons, as well as due to physical trauma. Cardiac arrest is not to be confused with a “heart attack”. A “heart attack”, known medically as a myocardial infarction, is the complete or partial obstruction of an artery in the heart causing a lack of oxygen delivery to a specific region of heart muscle. This can, but doesn’t always, cause cardiac arrest and sudden death. For the purposes of this proposal, I will be addressing cardiac arrest as it happens anywhere that isn’t a hospital (OHCA).

The Resuscitation Outcomes Consortium (ROC) is a consortium of clinical centers and a data coordinating center that keep track of cardiac arrest statistics in terms of incidence, response, and survivability. Figure 1 shows the most recent comprehensive out-of-hospital cardiac arrest data that shows that every year an approximate 140.7 individuals out of 100,000 go into OHCA (approximately 350,000 a year) (Benjamin et al., 2019).

An analysis of the different locations in which OHCA takes place found that it takes place most often in a residence (68.5%), followed by general public places (21%), and nursing homes or long-term care facilities (10.5%) (Benjamin et al., 2019). In all of these instances, OHCA occurred in front of another person 37% of the time (Benjamin et al., 2019). These are the statistics for OHCA as a whole in various regions across the country. We will now take a closer look at incidences OHCA as it applies to low socioeconomic communities and ethnic minorities.

**Figure One: Annual Incidence of OHCA in US Sites of the ROC, June 1, 2014, to May 31, 2015**

	Incidence per 100,000 (95% CI)	Annual No. of US Cases		
		N	95% LCL	95% UCL
<b>EMS assessed</b>				
Any age	110.8 (108.9–112.6)	356461	350349	362252
Adults	140.7 (138.3–143.1)	347322	341397	353246
Children	9.4 (8.3–10.5)	7037	6214	7861
<b>EMS treated</b>				
Any age	57.3 (56.0–58.7)	184343	180161	188847
Adults	73.0 (71.2–74.7)	180202	175759	184399
Children	7.3 (6.3–8.3)	5465	4716	6214
<b>VF*</b>				
Any age	12.1 (11.5–12.7)	38928	36997	40858
Adults	15.8 (15.0–16.6)	39003	37028	40978
Children	0.5 (0.3–0.8)	374	225	599
<b>Bystander-witnessed VF</b>				
Any age	7.0 (6.5–7.5)	22520	20912	24129
Adults	9.2 (8.6–9.8)	22710	21229	24192
Children	0.3 (0.1–0.5)	225	75	374

**Source: (Benjamin et al.,2019)**

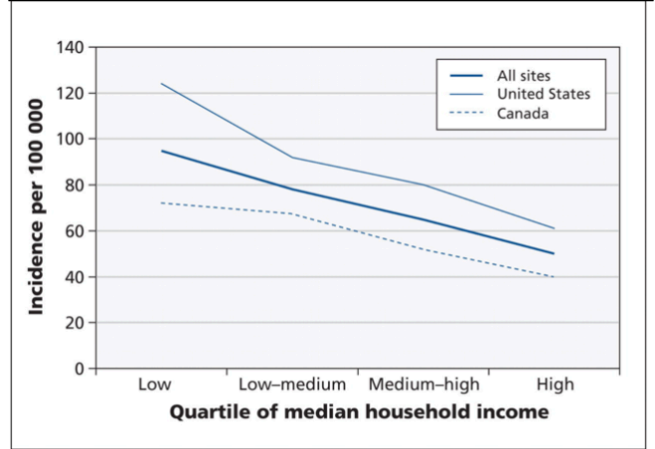
### *Out-Of-Hospital Cardiac Arrest: Low Income Neighborhoods*

Low income status has long been shown to increase the risk for various cardiovascular health issues (Clark, Desmeules, Luo, Duncan, & Wielgosz, 2009). One study (Reinier et al., 2011) sought to find out if low income status was also correlated to sudden cardiac arrest in the United States and Canada. This study found that there is a direct correlation between socioeconomic status and incidences of sudden cardiac arrest (Reinier et al., 2011). This study looked at 7 large North American urban populations (Dallas, Texas; Pittsburgh, Pennsylvania; Portland, Oregon; and Seattle-King County, Washington) (Reinier et al., 2011).

Figure 2 shows that as the median household income decreases, the chances of sudden cardiac arrest increase in a nearly linear fashion.

The disparities in household income found that people in low socioeconomic communities in the US have anywhere from double to a quadruple chance of experiencing sudden cardiac arrest as compared to people in higher income households. Another two year study in a county in Oregon found the incidences of cardiac arrest were 30-80% higher in the lowest socioeconomic census tract as compared to the highest income census tract (Reinier et al., 2006). This study analyzed the specific addresses where cardiac arrest took place and evaluated each instance in term of median income, poverty level, median home value, and educational attainment (Reinier et al., 2006). This study further suggested that socioeconomic status is to be a contributing factor when planning and implementing public based prevention strategies such as a CPR training (Reinier et al., 2006). We will now take an even closer look at these statistics as they apply to the specific ethnicity groups that reside in these neighborhoods.

**Figure 2: Incidence of Sudden Cardiac Arrest Among People of All Ages in all Sites Combined from Apr. 1, 2006, to Mar 31, 2007, by Quartile of Median Household Income**



Source: (Reinier et al., 2011)

*Out-Of-Hospital Cardiac Arrest: Ethnic Minorities*

A 1997 study (Gillum, 1997) analyzed cardiac arrest data from the National Center for Health Statistics in search of a correlation between race and sudden cardiac arrest. Gillum found that the highest percentage of cardiac arrests were taking place amongst Black males. A 2007 NYC study (Galea et al., 2007) sought to investigate the racial disparities in OHCA. Galea analyzed data from the FDNY EMS services in the New York Metropolitan region From April 1, 2002 to March 1, 2003. Figure 3 illustrates the age-adjusted findings from this study which found that the highest incidences of OHCA were highest amongst black people (10.1/10,000 adults) and lowest amongst white people (5.8/10,000 adults) (Galea et al., 2007). In addition to this, whites were more likely to be admitted to the hospital than Hispanics (11.2%

**Figure 3: Age-adjusted Incidence of Out-of-Hospital Cardiac Arrest and Survival Outcomes among New York City Residents (n = 4,053), April 2002–March 2003**

	Race/ethnicity				p value
	Black	Hispanic	White	Other	
Incidence of cardiac arrest (per 10,000 adults)*	10.1	6.5	5.8	4.8	<0.01†
Survival outcome (%)					
Admitted to hospital‡	6.0	8.6	11.3	10.2	<0.01§
Survived to discharge‡	1.4	1.9	3.4	0.9	<0.01§
Survived to discharge and lived for ≥30 days*	1.4	1.7	3.4	0.9	<0.01§
Died in hospital after being admitted	72.5	76.9	67.2	82.1	0.26§

Source: (Galea et al., 2007)



vs 8.6%), and Hispanics more than black people (8.6% vs 6.0%) (Galea et al., 2007). Survival after 30 days from hospital discharge was also analyzed and found that Hispanics and blacks survived at 1.7% and 1.3% respectively, compared to whites which survived at 3.4% (Galea et al., 2007). Galea found a significant correlation between ethnic differences in survival from OHCA.

*Survivability: Overview*

Survivability after OHCA is very low. The most recent statistics show that survivability to hospital discharge was between 10.8% and 11.4% for patients of any age (Benjamin et al., 2019). Furthermore, survivability with neurological functional status was only 9% (Benjamin et al., 2019). Figure 4 illustrates the trends in OHCA survivability as published by the Cardiac Arrest Registry to Enhance Survival (CARES) and the Resuscitation Outcomes Consortium (ROC) from 2006 to 2016.

**Figure 4:  
Trends in Layperson Response and Outcomes  
for EMS-Treated OHCA**

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Survival to hospital discharge, %											
ROC	10.2	10.1	11.9	10.3	11.1	11.3	12.4	11.9	12.7	12.4	...
CARES	...	...	...	...	...	10.5	10	10.6	10.8	10.6	10.8
Survival if first rhythm shockable, %											
ROC	25.9	29	33.6	27.8	30.1	30.9	34.1	32.7	33.5	30.2	...
CARES	...	...	...	...	...	...	...	...	29.3	29.1	29.5
First rhythm shockable, %											
ROC	23.7	21.7	21.9	20.9	20.8	21.4	21.7	20.2	20.8	21.3	...
CARES	...	...	...	...	...	23.2	23.1	23.2	20.4	20.1	19.8
Layperson-initiated CPR, %											
ROC	36.5	37.9	37.4	39.1	38.6	38.6	42.8	43	44.5	43.6	...
CARES	...	...	...	...	...	38	37.8	40.4	40.4	40.6	40.7
Layperson use of AED, %											
ROC	3.2	3.3	3.9	4.5	4	3.9	5.1	6	6.6	6.7	...
CARES	...	...	...	...	...	4.4	4	4.6	4.9	5.4	5.7
AED shock by layperson, %											
ROC	2	1.6	1.8	1.8	2	1.8	2	2.2	2.2	2.3	...
CARES	...	...	...	...	...	1.7	1.6	1.6	1.6	1.7	1.7

Source: (Benjamin et al., 2019)

*Survivability: Low Income Neighborhoods*

We’ve already established that incidences of cardiac arrest are approximately two-fold higher in lower socioeconomic areas (Reinier et al., 2006). Based on an earlier study that correlated a low socioeconomic status with higher incidences of cardiac arrest, a 2015 study (Uray et al., 2015) done in Pittsburg analyzed if lower socioeconomic areas also suffer from lower survivability rates. This study looked at cardiac arrest patients between the ages of 18-64 and focused on their place of residence, insurance, and employment status in order to analyze those characteristics against survivability (Uray et al., 2015). This study focused primarily on the favorable cerebral performance (CPC) post cardiac arrest among 415 subjects (Uray et al., 2015). The study found that subjects that survived with favorable CPC were likely to be employed and white, amongst other factors (Uray et al., 2015).

A European study analyzed the relationship between socioeconomic status (SES) and 30 day survival after OHCA (Jonsson et al., 2019) in Stockholm county, Sweden. Jonsson analyzed all EMS treated OHCA patients from January 1, 2006 to December 31, 2015. The variables used for this study were the median household disposable family income and the percentage of the population with a university degree (Jonsson et al., 2019). Out of 7431 cases studied, there were significant differences in survivability variation amongst income level and education (Jonsson et al., 2019). The 30 day survivability rate was 6.3% for the lowest income groups as compared to

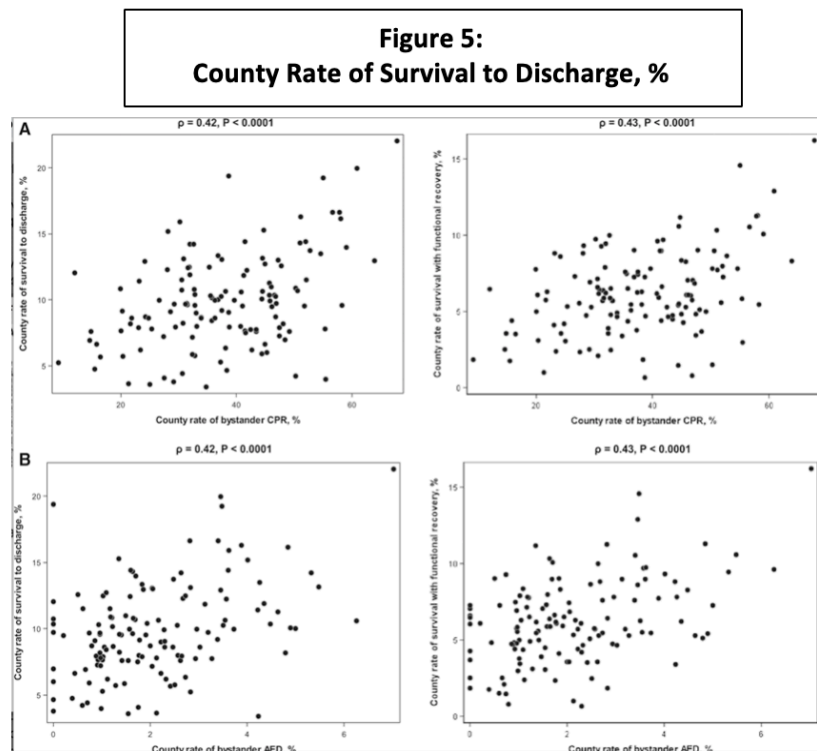
10.5% in the highest income groups (Jonsson et al., 2019). There was also a higher survivability rate amongst groups with higher education, and groups with both a higher socioeconomic status and higher levels of education (Jonsson et al., 2019)..

*Survivability: Ethnic Minorities*

We previously cited a NYC study (Galea et al., 2007) that analyzed racial composition and its relationship with the incidences of OHCA. We are going to refer to the same study to discuss the correlation between race and survivability after OHCA. This study measured 30-day patient survival as well as percentage of patients admitted to hospital, and the percentage of patients that survived to discharge amongst other parameters (Galea et al., 2007). Out 4,053 cases of OHCA the 30 day age-adjusted survival was 3.4 amongst white patients, and 1.7 and 1.3 in Hispanic and black patients respectively (Galea et al., 2007). The results of this study found that 30-day survival from OHCA was more than twice as poor for blacks and Hispanics in comparison to whites. This study further took into account that some of this survivability data can be correlated to the fact that bystander CPR is started with less frequency amongst communities in which people of these ethnicities live (Galea et al., 2007). Despite this, Galea found that adjusting for these factors did not increase the lower survivability in OHCA amongst ethnic minorities.

*Survivability: Bystander CPR & AED Use*

There are large variations in survivability after OHCA, but the numbers are historically low. Survivability rates are worse in lower socioeconomic communities and amongst people of ethnic minorities (Girotra et al., 2016). A regional variation study was done in 2016 to try and pinpoint what some of the factors are that affect survivability (Girotra et al., 2016). Girotra found that there was a significant positive correlation between survival to hospital discharge and survival with good neurological outcomes in counties with a higher instances of Bystander CPR and AED use. Figure 5 is an illustrative scatter plot that represents the correlation between bystander CPR and AED use and survivability to hospital discharge. As can be seen from the graph, survivability increases from left to right as the percentage of bystander CPR increases. This study suggests that public health initiatives, namely



Source: (Girotra et al., 2016)

As can be seen from the graph, survivability increases from left to right as the percentage of bystander CPR increases. This study suggests that public health initiatives, namely

those that improve bystander CPR could increase survivability, especially in neighborhoods comprised mostly of black residents (Girotra et al., 2016).

A 2010 study analyzed bystander CPR in terms of hands-only CPR, and CPR with breaths and its correlation to 30-Day survivability in OHCA (Riva et al., 2019). In a study of approximately 30,000 OHCA patients the findings were consistent with a nearly double survivability rate in those who received bystander CPR compared to those who didn't (Riva et al., 2019).

A Swedish study analyzed approximately 30,000 instances of OHCA from 1990 to 2011 in order to see if bystander CPR improved survivability (Hasselqvist-Ax et al., 2015). In all of these cases, CPR was performed approximately 51.5% of the time (Hasselqvist-Ax et al., 2015). The study found that when CPR was performed by a bystander the 30-Day survivability was 10.5% as opposed to just 4% when it was not performed (Hasselqvist-Ax et al., 2015).

An exhaustive collection of data from the Resuscitation Outcomes Consortium (ROC) and the Cardiac Arrest Registry to Enhance Survival (CARES) further emphasized the correlation between survivability from Cardiac Arrest and bystander CPR and AED use from 2006 to 2016 (Benjamin et al., 2019). Referring back to Figure 4 on page 3 we can see that while the survivability from cardiac arrest varies from 10.1% to 12.7%, it increases exponentially when there was bystander CPR and AED use (Benjamin et al., 2019).

#### *CPR & AED Training Disparities*

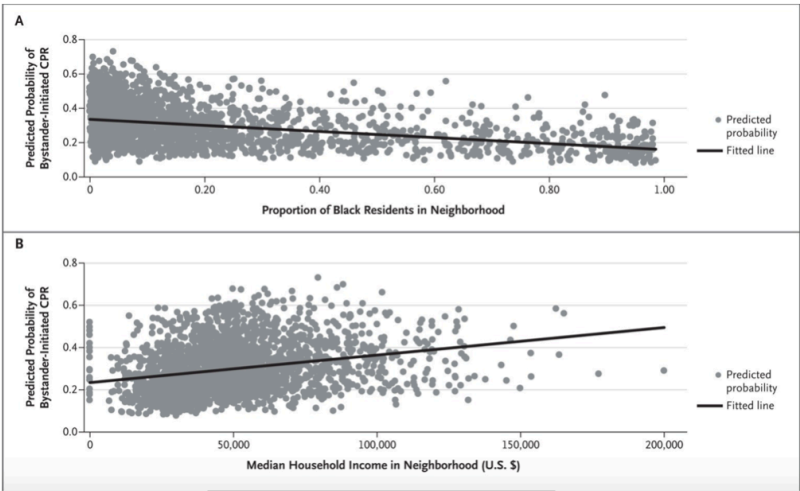
A cross-sectional ecologic study (Anderson et al., 2014) analyzed the rates of CPR training across the country from 2010 to 2011 using data from the American Heart Association, the American Red Cross, and the Health and Safety Institute. This study of 13.1 million people found that the percentage of people trained in CPR ranges anywhere from 0% to 6.81 percent (Anderson et al., 2014). An analysis of this data found that the counties that had a lower percentage of CPR training had a couple of factors in common. Amongst these factors were counties with high populations of black and Hispanic residents and a lower socioeconomic status (Anderson et al., 2014). Considering the fact that bystander CPR is directly correlated to survival after OHCA, the lack of CPR training in these communities further diminishes favorable outcomes for the people living in them.

Aside from the fact that there are lower rates of CPR training amongst members of these communities, there is also a general hesitation to start CPR in these communities regardless of training. A study in 2014 (Moon et al., 2014) sought to analyze OHCA data as it applies to predominantly Hispanic neighborhoods. The results of this study found that the provision of CPR is lower in predominantly Hispanic neighborhoods (28.6% vs 43.8%) as compared to non-Hispanic neighborhoods (Moon et al., 2014). As a result, survivability from OHCA was significantly lower in these neighborhoods (4.9% vs 10.8%) (Moon et al., 2014).

Another 2012 study sought to investigate how neighborhood characteristics influence the instances in which bystanders initiate CPR (Sasson et al., 2012). Sasson gathered data submitted to the Cardiac Arrest Registry to Enhance Survival (CARES) in order to analyze it for disparities

in terms of household income and race. They found that patients that lived in low-income black neighborhoods were less likely to receive CPR by a bystander as compared to higher income neighborhoods (Sasson et al., 2012). Part A of Figure 6 illustrates the predicted probability of bystander-initiated CPR as it correlates to the proportion of black residents. Part B shows the predicted probability of CPR as it correlates to household income. As is clearly illustrated in these two charts, the probability of bystander CPR decreases as household income decreases, and as the proportion of black residents increases. As we've noted previously in this proposal, this directly correlates to poor survivability in these communities and amongst these specific ethnicities.

**Figure 6:  
Predicted Probability of Bystander Initiated  
Cardiopulmonary Resuscitation (CPR).**



Source: (Sasson et al., 2012)

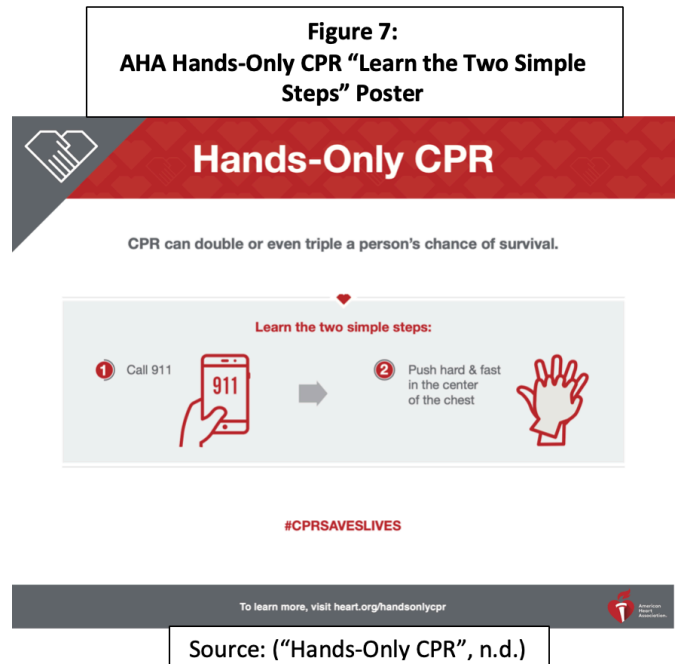
Sassoon then sought out to investigate the barriers and facilitators to calling 9-1-1 in these communities by conducting a study in 5 low-income, Latino neighborhoods, in Denver, CO (Sasson et al., 2015). This study was done via focus groups and interviews with members of these communities. The participants suggested that some things that would increase their likelihood of performing CPR were an increase in training in Spanish, and including CPR as a requirement for graduation (Sasson et al., 2012).

**Literature Review**

*American Heart Association’s “Hands-Only” CPR*

The American Heart Association (AHA) launched their “Hands-Only” CPR campaign in 2012 in order to teach people how to recognize cardiac arrest and do effective chest compressions (Hands-Only CPR”, n.d.). This project focused on simplifying the algorithm for CPR by breaking it down into the least amount of steps possible in order to increase the retention of this information by large masses of people, and in order to encourage people to do CPR. This model of training was broken down into two simple steps - if you notice an adult or a teenager suddenly collapse; call 9-1-1, and push fast and hard in the center of the chest. (“Hands-Only CPR”, n.d.). The AHA estimates that since 2012 they have trained approximately 22,000 people in 22 states (“Hands-Only CPR”, n.d.). These classes usually involve an instructor to student ratio of approximately 1:30, CPR manikins, and AED trainers. The AHA had financial support for this project from the Anthem Foundation (“Hands-Only CPR”, n.d.).

Figure 7 is an example of one of the AHA's marketing posters for this campaign. Several key studies have been used to compare the model of hands-only CPR. A 2008 study gathered data over a 10 year period to compare the efficacy of hands-only CPR in various parameters as they pertain to OHCA (Sayre et al., 2008). This study found that the hands-only CPR method led to a quicker initiation of chest compressions in bystanders compared to other models thus increasing survivability nearly two-fold (Sayre et al., 2008). An analysis of actual bystanders who were interviewed post OHCA incidents found that the simplicity of the hands-only CPR model improved bystander's ability to learn and start chest compressions during an OHCA incident as well as minimized the time spent by 9-1-1 dispatchers in relaying CPR and first-aid instructions to bystanders (Sayre et al., 2008).



Source: ("Hands-Only CPR", n.d.)

*American Heart Association's "Hands-Only" CPR Kiosks*

In addition to their "Hands-Only" CPR campaign, the AHA launched a pilot program of a CPR self-training kiosk in the Dallas/Ft. Worth International Airport (DFW) in 2016 ("Hands-Only CPR Kiosks", n.d.). This was an initiative that was supported financially by the Anthem Foundation and included the placement of a total of 6 kiosks placed in high traffic areas across the country ("Pioneering training kiosks provide 100,000 with Hands-Only CPR skills", 2018). This program involved a self-training kiosk with a touch screen that shows a brief instructional video and a rubber manikin torso in order to practice chest compressions. The kiosk also had a 30 second CPR test in order to provide instant feedback to the participants. The entire training process takes approximately 5 minutes. The AHA currently has approximately 30 kiosks across the country. Figure 8 is a sample promotional flyer for the kiosk. Since the inception of this program it is estimated that this kiosk has trained approximately 100,000 people across the nation ("Pioneering training kiosks provide 100,000 with Hands-Only CPR skills", 2018). These kiosks are one of the cornerstones of the AHA's goal of training a total of 20 million people a year in CPR ("Pioneering training kiosks provide 100,000 with



Source: ("Hands-Only CPR Kiosks", n.d.)

Hands-Only CPR skills", 2018).

A study into the efficacy of the self-training kiosk was conducted on the kiosk placed in the Dallas Fort Worth International airport (DFW) in the year 2013 (Chang et al., 2017). DFW saw approximately 64 million passengers in the year 2015 and thus was deemed a good place to install one of these kiosks (Chang et al., 2017). In the 6 month period that this study was conducted a total of 23,478 people visited the kiosk and received training (Chang et al., 2017). The results showed that the quality of chest compressions performed on the manikin increased after having watched the short instructional video (Chang et al., 2017). Aside from the physical results in terms of CPR efficacy as measured on the training manikin, one of the biggest results from this study was that just the mere act of having a training kiosk increased general CPR awareness (Chang et al., 2017). The efficacy of these kiosks has already begun to translate into saved lives. In 2015, a University of Dayton (Ohio) student saved the life of a man that had been struck by lightning after having learned CPR on the kiosk at DFW ("Pioneering training kiosks provide 100,000 with Hands-Only CPR skills", 2018). Additionally, after having learned CPR from a kiosk placed in the Indianapolis International Airport in 2016, a police officer saved the life of a traveler that suffered sudden cardiac arrest while at the airport ("Pioneering training kiosks provide 100,000 with Hands-Only CPR skills", 2018).

## **Plan of Action**

### *American Heart Association's "Hands-Only" CPR*

My plan is to bring the American Heart Association's (AHA) "Hands-Only" CPR training model, and "Hands-Only" CPR kiosk to the Elizabethport neighborhood of Elizabeth, NJ. Elizabeth is New Jersey's fourth largest city with an approximate population of 128,000 as of July of 2018. Elizabeth's race demographic is composed of 64% Hispanic, 19% black, and 46% white. In terms of socioeconomic status, Elizabeth has an average household income of \$45,186 and a poverty rate of 18%. The Elizabethport neighborhood is a densely populated neighborhood with approximately 27,201 people per square mile. It is a neighborhood mostly comprised of families of an ethnic minority. Families in this neighborhood have a lower income than approximately 86.2% of other neighborhoods in the U.S.. Considering the socioeconomic and ethnic composition of this neighborhood make it the ideal place for the implementation of this plan.

Part one of my plan is to offer free hands-only CPR classes to the residents of this neighborhood. I plan on initially offering these classes once a month, and then increasing on from there in order to accommodate more people. In terms of location, I plan on reaching out to local politicians, businesses, and grass roots organizations in order to obtain a location where the classes could take place. There is a great amount of flexibility in terms of where these classes can take place due to the fact that the only equipment needed is an instructor, CPR manikins, and AED trainers. I would aim to teach these classes in common public spaces that are familiar to the community, and have the easiest amount of accessibility. The initial format of the class would be approximately 1 instructor to 20-30 people. I plan on recruiting a network of CPR instructors, myself included, in order to expand these classes and reach a larger audience. These classes would be offered in both English and Spanish in order to reach out to the Hispanic members of

the community. The goal is to incorporate instructors that speak other languages that make up the remaining ethnicities of these communities.

Advertisement for these classes would be primarily through social media and flyers placed around the community. I plan on enlisting the assistance of local politicians and influential community members in order for them to advertise this event on their various social media outlets. The class would be approximately half an hour in duration and would include an initial overview of cardiac arrest and CPR and how to recognize cardiac arrest, call for help, and initiate chest compressions. Then the students would each practice on the manikins individually, ensuring that they understand the mechanics of chest compression in terms of depth and rate. Afterwards, they would all work in groups and incorporate the deployment of an automated external defibrillator (AED) into their manikin simulations. The class would conclude with a question and answer time, as well as an overview of CPR and the real life implications it has in their communities.

The overall goal of these classes would be for them to gain popularity and increase in frequency. First I would like to see an increase in frequency within the Elizabethport neighborhood, and then in other neighborhoods in Elizabeth. The long term goal and vision is for these classes to be offered various times a month, in various locations, across various low socioeconomic communities in the state of New Jersey.

#### *American Heart Association's "Hands-Only" CPR Kiosks*

The second part of my plan is to deploy an American Heart Association (AHA) "Hands-Only" Kiosk to the Elizabethport neighborhood. More specifically, I plan on having one installed in the Elizabethport Community Center. The Elizabethport Community Center is a centrally located community center that is run by the city and hosts all sorts of events for the community throughout the year. The kiosk would be placed in the lobby of the community center due to the high volume of people that come across the kiosk on a daily basis. The kiosk would be installed and maintained by the AHA as part of the sponsorship deal.

The population density and high traffic of the area where the community center is located makes it an ideal situation in terms of being able to reach the highest possible amount of people. Advertisement for the kiosk would be via the social media accounts of local politicians and community members and through flyers placed throughout the city. The kiosk would also be promoted during the "Hands-Only" CPR class in order to inform as many people of its location. My plan is also to keep a current calendar of the "Hands-Only" CPR classes where the kiosk is located inviting people who are interested to participate in a full CPR class. The overall vision for this is to place a kiosk in every community center in Elizabeth, and then to further expand to various neighborhoods and cities throughout New Jersey that have the highest need.

The overall vision for these self-training kiosks is that they be located in various different locations throughout the city of Elizabeth with an emphasis on locations that are frequented by members of the community that identify with the lowest socioeconomic status as well as those representative of ethnic minorities.

## Budget

In order to teach hands-only CPR courses to the general public we need CPR manikins, and AED trainers. The cost of the manikins and AED trainers is the average cost across a variety of manufacturers. The following table is an outline of the cost of the equipment needed for a class of approximately 20 to 40 people. I will be teaching this classes myself along with other CPR instructors pro-bono. In addition to this, I've outlined the cost of 1 American Heart Association (AHA) CPR self-training kiosk to be placed within the Elizabethport neighborhood. The outlined cost of the kiosk involves a platform-level sponsorship with the AHA for a required minimum of 3 years. This sponsorship covers the manufacture, maintenance, and up-keep of the CPR kiosk. Finally, included is the cost for 100 flyers for advertising the classes and the kiosk.

CPR Manikins	\$800
AED Trainers	\$1,200
AHA CPR Kiosk (3 years)	\$450,000
Flyers for Advertisement	\$80
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Total Cost:	\$532,000

## Discussion of Plan

Communities of low socioeconomic status comprised of ethnic minorities are faced with the daily reality that they have a significantly lower chance of surviving an out-of-hospital cardiac arrest. It isn't often that the solution to a problem of such a large magnitude is so easily identifiable, and better yet, so easily addressed. The members of these communities experience cardiac arrest at higher rates and have lower survivability rates than everyone else. Despite the fact that there is a substantial amount of research that directly correlates bystander CPR to improved survivability, these communities get CPR the least, and are the least trained population. There is a mounting amount of medical evidence that shows that simple "hands-only" bystander CPR is incredibly effective in increasing survivability from cardiac arrest. Ms. Boudreaux, as the leader of the Anthem Foundation, you understand the value of empowering communities to live long and healthy lives. Your financial contribution can make the difference in empowering these communities to save each other's lives.



## References

- Alexander M. Clark, Marie Desmeules, Wei Luo, Amanda S. Duncan, & Andy Wielgosz. (2009). Socioeconomic status and cardiovascular disease: risks and implications for care. *Nature Reviews Cardiology*, 6(11), 712–722. <https://doi.org/10.1038/nrcardio.2009.163>
- Anderson, M., Cox, M., Al-Khatib, S., Nichol, G., Thomas, K., Chan, P., ... Peterson, E. (2014). Rates of Cardiopulmonary Resuscitation Training in the United States. *JAMA Internal Medicine*, 174(2), 194–201. <https://doi.org/10.1001/jamainternmed.2013.11320>
- Benjamin, J., Muntner, S., Alonso, W., Bittencourt, P., Callaway, M., Carson, R., ... Virani, S. (2019). Heart Disease and Stroke Statistics—2019 Update: A Report From the American Heart Association. *Circulation*, 139(10), e56–e66. <https://doi.org/10.1161/CIR.0000000000000659>.
- Blewer, A., Ibrahim, S., Leary, M., Dutwin, D., McNally, B., Anderson, M., ... Abella, B. (2017). Cardiopulmonary Resuscitation Training Disparities in the United States. *Journal of the American Heart Association: Cardiovascular and Cerebrovascular Disease*, 6(5). <https://doi.org/10.1161/JAHA.117.006124>.
- CARES Cardiac Arrest Registry to Enhance Survival. (2016). Retrieved December 4, 2019, from <https://mycares.net/>.
- Chang, M., Gent, L., Sweet, M., Potts, J., Ahtone, J., & Idris, A. (2017). A novel educational outreach approach to teach Hands-Only Cardiopulmonary Resuscitation to the public. *Resuscitation*, 116, 22–26. <https://doi.org/10.1016/j.resuscitation.2017.04.028>

## References

- CPR is key to survival of sudden cardiac arrest. (2018, June 22). Retrieved December 10, 2019, from <https://www.heart.org/en/news/2018/07/12/cpr-is-key-to-survival-of-sudden-cardiac-arrest>.
- Galea, S., Blaney, S., Nandi, A., Silverman, R., Vlahov, D., Foltin, G., ... Richmond, N. (2007). Explaining racial disparities in incidence of and survival from out-of-hospital cardiac arrest.(Original Contribution). *American Journal of Epidemiology*, *166*(5), 534–543. <https://doi.org/10.1093/aje/kwm102>
- Gillum, R., & Gillum, R. (1997). Sudden cardiac death in Hispanic Americans and African Americans. *American Journal of Public Health*, *87*(9), 1461–1466. <https://doi.org/10.2105/AJPH.87.9.1461>
- Girotra, K., Van Diepen, L., Nallamothu, S., Carrel, S., Vellano, S., Anderson, S., ... Chan, S. (2016). Regional Variation in Out-of-Hospital Cardiac Arrest Survival in the United States. *Circulation*, *133*(22), 2159–2168. <https://doi.org/10.1161/CIRCULATIONAHA.115.018175>
- Hands Only CPR. (n.d.). Retrieved December 6, 2019, from <https://cpr.heart.org/en/cpr-courses-and-kits/hands-only-cpr>.
- Hands-Only CPR Training Kiosks. (n.d.). Retrieved December 6, 2019, from <https://cpr.heart.org/en/cpr-courses-and-kits/hands-only-cpr-kiosks>.
- Hasselqvist-Ax, I., Riva, G., Herlitz, J., Rosenqvist, M., Hollenberg, J., Nordberg, P., ... Svensson, L. (2015). Early Cardiopulmonary Resuscitation in Out-of-Hospital Cardiac Arrest. *The New England Journal of Medicine*, *372*(24), 2307–2315. <https://doi.org/10.1056/NEJMoa1405796>

## References

- Jonsson, M., Härkönen, J., Ljungman, P., Rawshani, A., Nordberg, P., Svensson, L., ...  
Hollenberg, J. (2019). Survival after out-of-hospital cardiac arrest is associated with area-level socioeconomic status. *Heart*, *105*(8), 632–638. <https://doi.org/10.1136/heartjnl-2018-313838>
- Moon, S., Bobrow, B., Vadeboncoeur, T., Kortuem, W., Kisakye, M., Sasson, C., ... Spaite, D. (2014). Disparities in bystander CPR provision and survival from out-of-hospital cardiac arrest according to neighborhood ethnicity. *American Journal of Emergency Medicine*, *32*(9), 1041–1045. <https://doi.org/10.1016/j.ajem.2014.06.019>
- Pioneering training kiosks provide 100,000 with Hands-Only CPR skills. (2018, August 21). Retrieved December 10, 2019, from <https://newsroom.heart.org/news/pioneering-training-kiosks-provide-100-000-with-hands-only-cpr-skills>.
- Reinier, K., Stecker, E., Vickers, C., Gunson, K., Jui, J., & Chugh, S. (2006). Incidence of sudden cardiac arrest is higher in areas of low socioeconomic status: A prospective two year study in a large United States community. *Resuscitation*, *70*(2), 186–192. <https://doi.org/10.1016/j.resuscitation.2005.11.018>
- Reinier, K., Thomas, E., Andrusiek, D., Aufderheide, T., Brooks, S., Callaway, C., ... Chugh, S. (2011). Socioeconomic status and incidence of sudden cardiac arrest.(Research) (Report). *CMAJ: Canadian Medical Association Journal*, *183*(15), 1705–17012. <https://doi.org/10.1503/cmaj.101512>

## References

- Riva, G., Ringh, M., Jonsson, M., Svensson, L., Herlitz, J., Claesson, A., ... Hollenberg, J. (2019). Survival in Out-of-Hospital Cardiac Arrest After Standard Cardiopulmonary Resuscitation or Chest Compressions Only Before Arrival of Emergency Medical Services: Nationwide Study During Three Guideline Periods. *Circulation*, *139*(23), 2600–2609. <https://doi.org/10.1161/CIRCULATIONAHA.118.038179>
- Sasson, C., Haukoos, J., Ben-Youssef, L., Ramirez, L., Bull, S., Eigel, B., ... Padilla, R. (2015). Barriers to Calling 911 and Learning and Performing Cardiopulmonary Resuscitation for Residents of Primarily Latino, High-Risk Neighborhoods in Denver, Colorado. *Annals of Emergency Medicine*, *65*(5), 545–552.e2. <https://doi.org/10.1016/j.annemergmed.2014.10.028>
- Sasson, C., Magid, D., Chan, P., Root, E., McNally, B., Kellermann, A., & Haukoos, J. (2012). Association of Neighborhood Characteristics with Bystander-Initiated CPR. *The New England Journal of Medicine*, *367*(17), 1607–1615. <https://doi.org/10.1056/NEJMoa1110700>
- Sayre, R., Berg, A., Cave, M., Page, L., Potts, D., & White, D. (2008). Hands-Only (Compression-Only) Cardiopulmonary Resuscitation: A Call to Action for Bystander Response to Adults Who Experience Out-of-Hospital Sudden Cardiac Arrest: A Science Advisory for the Public From the American Heart Association Emergency Cardiovascular Care Committee. *Circulation*, *117*(16), 2162–2167. <https://doi.org/10.1161/CIRCULATIONAHA.107.189380>

## References

- Schiller, A. (2019, September 24). Elizabethport, Elizabeth, NJ 07206, Neighborhood Profile. Retrieved October 16, 2019, from <https://www.neighborhoodscout.com/nj/elizabeth/elizabethport>.
- The Cardiac Arrest Registry to Enhance Survival (CARES). (n.d.). Retrieved December 4, 2019, from <https://mycares.net/sitepages/aboutcares.jsp>.
- Uray, T., Mayr, F., Fitzgibbon, J., Rittenberger, J., Callaway, C., Drabek, T., ... Dezfulian, C. (2015). Socioeconomic factors associated with outcome after cardiac arrest in patients under the age of 65. *Resuscitation*, 93, 14–19. <https://doi.org/10.1016/j.resuscitation.2015.04.032>
- U.S. Census Bureau QuickFacts: Elizabeth city, New Jersey. (2018, July 1). Retrieved October 16, 2019, from <https://www.census.gov/quickfacts/elizabethcitynewjersey>.