

**Implementing a Community-Based CPR Training Initiative Utilizing Pre-Medical  
Students as Facilitators**

Final Report: Office of Community Engagement Faculty Grant Program

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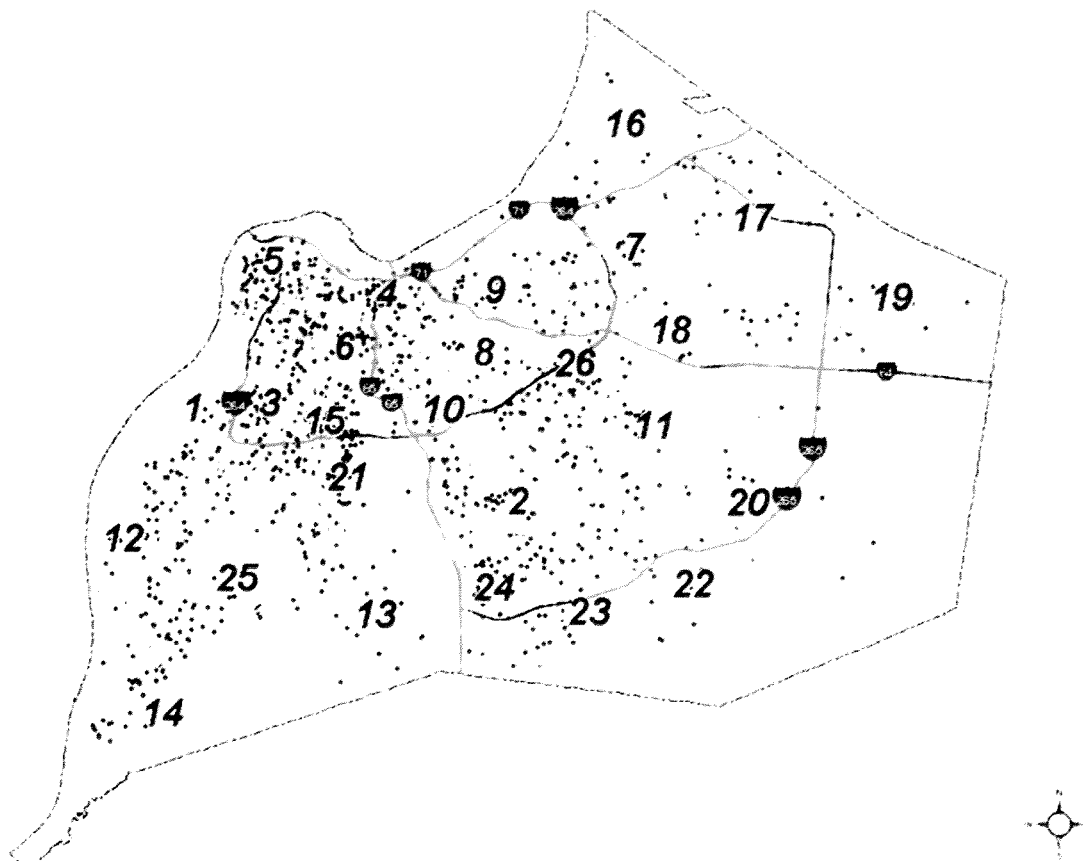
## Background

Out-of-hospital cardiac arrest (OHCA) is defined as “a sudden and unexpected pulseless condition attributable to cessation of cardiac mechanical activity” and is a leading cause of death in the United States (Roger et al., 2012). Survival rates for OHCA vary by geography and are estimated to be between 6-14% in the Louisville Metro. Bystander-initiated cardiopulmonary resuscitation (CPR) significantly increases survival rates for OHCA and quality of life thereafter (Becker, Ostrander, Barrett, & Kondos, 1991; Roth, Stewart, Rogers, & Cannon, 1984; Stiell et al., 2003). However, only a small portion of cardiac arrest victims receive bystander CPR. Denmark recently undertook an initiative to increase CPR education in their country. In a 10-year period they increased bystander CPR from 21% up to 45%, and during the same time period the survival to the hospital from cardiac arrest increased from 8% to 22% (Wissenberg et al., 2013).

Within Jefferson County, rates of cardiac arrest are concentrated in West Louisville. With data obtained through Louisville Metro emergency medical services (EMS), Figure 1 reveals that incidence of OHCA are concentrated in districts 1, 3, 4, 5, 6 and 15.

Figure 1.

Cardiac arrest by location as reported by Louisville Metro EMS



There are significant disparities in CPR provision and OHCA survival at the individual and neighborhood level for Blacks, Latinos, and the poor (Sasson, Meischke, et al., 2013). Cardiac arrests that occur in more affluent census tracts are more likely to receive bystander CPR compared to those that occur in low-income areas, and low-income areas should be targets for community-based CPR training (Feero, Hedges, & Stevens, 1995; Sasson et al., 2011). A person who has been taught CPR once is more than 50% more likely to perform bystander CPR if the need arises (Swor et al., 2006).

However, financial costs associated with training are often a barrier to community efforts to increase CPR training (Sasson, Haukoos, et al., 2013).

A prior barrier to CPR training and action was the complexity of traditional “mouth-to-mouth” CPR. Continuous Chest Compression (CCC) CPR or “hands only” CPR is simpler and easier for individuals to remember. Cardiac arrest patients receiving Continuous Chest Compression (CCC) CPR or “Hands Only” CPR from bystanders experience the same outcomes as those receiving standard CPR (Dumas et al., 2013; Olasveengen, Wik, & Steen, 2008). Training Louisville communities with high rates of OHCA in hands-only CPR at no cost may be an effective strategy to improving survival rates and quality of life for patients.

### **Project Purpose and Nature**

Through a collaborative effort with the Start the Heart Foundation and the NorthWest Area Health Education Center, this project was designed (1) to use community CPR training and education to improve survival after cardiac arrest, and (2) to provide a one-of-a-kind internship opportunity to pre-medical students who were CPR certified to teach hands-only CPR in the community at no charge to the recipients. This was designed to increase the number of CPR-trained individuals in the community, improving cardiac arrest survival rates. The purpose of this infrastructure development project was to aid in the implementation of the Start the Heart program to increase cardiac arrest symptom awareness and bystander action in cardiac emergencies in our community, focusing these efforts in West Louisville. The goal for this first year was to

train 1,000 individuals in the Louisville Metro community, tracking the number of community members training in CPR by zip code.

### **Methodology**

In the summer of 2014, three University of Louisville pre-medical students were certified as CPR instructors to teach hands-only CPR to members of the community at no cost to the recipients. Pre- and post-tests collecting demographic data and measuring participant CPR knowledge were administered during all trainings. The Wilcoxon signed-rank test was used to assess changes in pre- and post- test participant responses. At the conclusion of the internship, students submitted essays reflecting on their experiences providing CPR training in the community, specifically addressing the following points: 1) Academic, professional and personal goals related to the experience and how these evolved based on the student's experiences; 2) the way in which the student's expectations about his or her experiences in the internship compare to his or her actual experiences; 3) a comparison of their experiences in conducting the training within differing populations and community settings; and 4) how this experience relates to the student's goals for subsequent learning opportunities.

### **Results**

Training sites included schools, community centers, and local businesses. During the months of May - August 2014, the students trained 1,893 individuals, the majority (69%) of which had no prior CPR training. Figure 2 displays photos of the interns training at various community sites.

Figure 2.

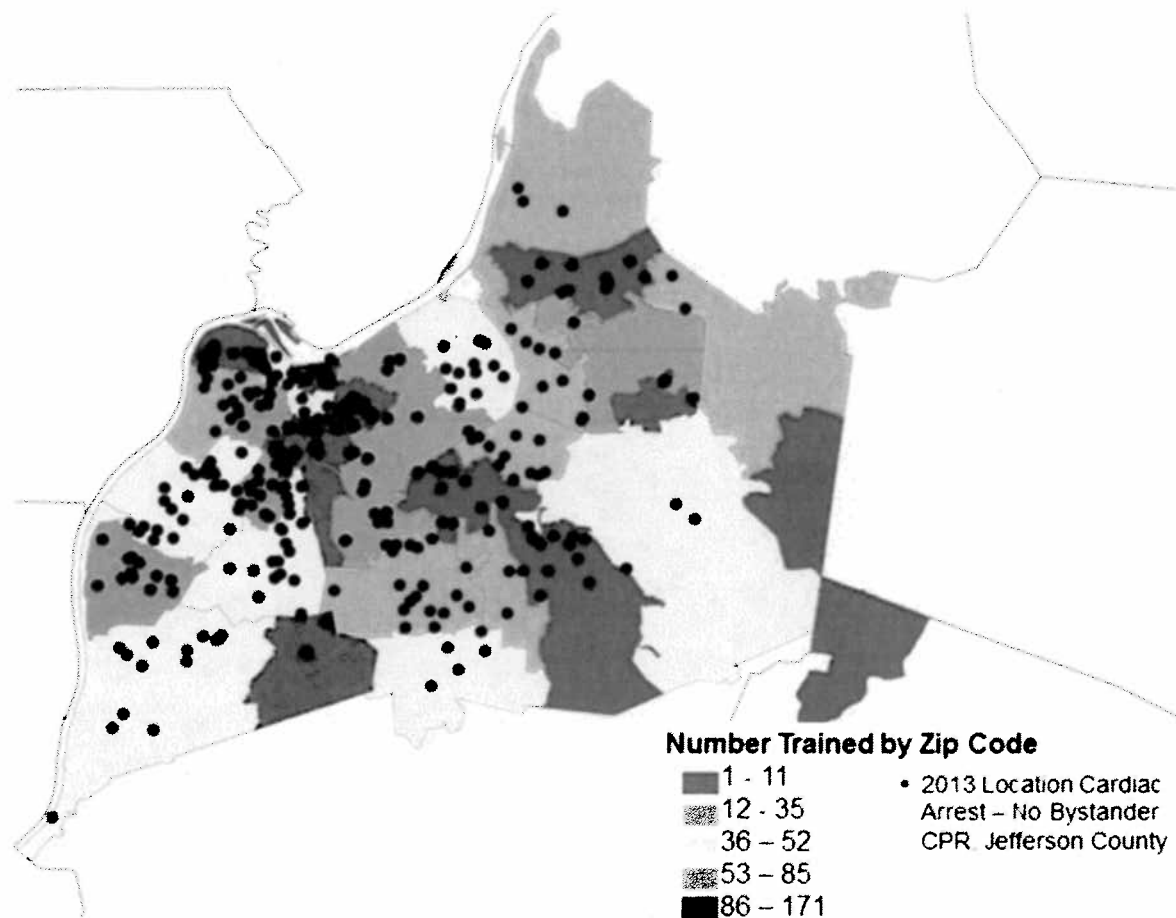
Trainings at community sites



Individuals were trained from all zip codes across the Louisville Metro community. Figure 3 demonstrates the number of individuals trained by zip code.

Figure 3.

Number trained by zip code



Participants ranged in age from 10 – 88 years old, with a mean age of 26.25 years. Thirty-five percent of participants were African American/Black, and 8% reported their ethnicity as Hispanic or Latino. Analysis of pre- and post- test data revealed that participants were significantly more likely initiate hands-only CPR on a family member ( $p < 0.001$ ), an acquaintance ( $p < 0.001$ ), and a stranger ( $p < 0.001$ ) following the training.

Student reflection papers revealed a variety of learning experiences, including the development of communication and health education skills, leadership, and

community organizing. The student interns experienced the challenges of community-engaged work, as one student summed it up as:

*“Getting into the Louisville community turned out to be much more difficult than I had anticipated. Many of our classes were well attended, but we did face times where we had few or no people attend.”*

Students also reported the need to adapt the training to the different groups due to differences in educational, cultural, and social factors:

*“I learned that I had to address each class differently. For example, I expected teaching at after school community centers would be similar to teaching at schools, but it was a little different. At the middle schools, we taught one grade level at a time, but at the after school community centers there were kids of different ages, teen helpers, and adult proctors. This made addressing these groups a little harder than usual because of the different levels of understanding and age differences in the class. This was also the case in other church and community classes even if the participants’ ages were similar. I learned quickly that being able to address the main points in a simple and effective manner would not be the same from class to class because of different educational, cultural, and social factors.”*

### **Conclusions**

This unique strategy to increase cardiac arrest symptom awareness and bystander action in cardiac emergencies was successfully implemented in the Louisville community during the summer of 2014. The inaugural interns were successful in training a diverse population in a relatively short amount of time. Aside from simply providing CPR training, the student interns learned skills in leadership, community organizing, and health education, which will serve them well in their future careers as health professionals. Overall, this is a sustainable model that can be implemented in other communities to increase CPR provision in cardiac arrest.



### Ongoing Partnership

The Health Sciences Center Office of Diversity and Inclusion (ODI) continues to work closely with the Start the Heart Foundation. Start the Heart currently has 4 part-time interns working to train all freshmen in JCPS and have trained approximately 2,000 additional individuals since September. Start the Heart Foundation has successfully obtained other funding to sustain the program. The ODI will continue to promote STHF as an internship opportunity for premedical students at UofL and are helping to recruit new interns for Summer 2015.

STHF continues to use the pre- and post-test developed by the ODI in all of their CPR training sessions. The ODI is working with STHF to evaluate and disseminate findings of this unique community initiative. Outcomes of this project have been presented at the following venues:

Leslie, K.F., Jones, V.F., Ziegler, C., Casey, M.E.\* , Zolj, A.\* , Calderon, C.A.\* , & Dillon, W.C. (2014, November). *Implementing a Community-Based CPR Training Initiative Utilizing Pre-Medical Students as Facilitators*. Panel presentation at the Ninth Annual Kentucky Engagement Conference, Morehead, KY.

Zolj, A.\* , Calderon, C.A.\* , Dillon, W.C., Leslie, K.F, Jones, V.F., Ziegler, C., & Casey, M.E.\* (2014, October). *Start the Heart: A community-based approach to increase bystander-initiated CPR in cardiac arrest*. Poster Session at the Tenth Annual Meeting of the Kentucky Chapter of the American College of Cardiology, Louisville, KY.

\* Denotes Student Interns

An additional abstract has been accepted for poster presentation at the upcoming 67<sup>th</sup> Annual Kentucky Public Health Association Conference in Owensboro, KY.

More distal outcomes will be assessed in future survival rates of OHCA in Louisville, focusing on specific rates in the zip codes served. Louisville Metro EMS will

soon be part of the national Cardiac Arrest Registry to Enhance Survival (CARES) initiative. Developed by the Centers for Disease Control and Prevention (CDC), the CARES registry helps EMS providers measure how well they respond to OHCA and provides a uniform OCHA surveillance system (Wissenberg et al., 2013). The CARES registry is HIPAA-compliant and can easily analyze local EMS data to measure and compare performance to other participating communities. Data from the Louisville CARES registry will assist in outcome measures and aid in determining opportunities for future research.

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resuscitation in neighborhoods with low bystander cardiopulmonary resuscitation prevalence and high rates of cardiac arrest in Columbus, OH. *Circ Cardiovasc Qual Outcomes*, 6(5), 550-558. doi: 10.1161/circoutcomes.111.000097

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**Financial Report (As of 12/31/2014)**  
**Community Engagement Grant – Start the Heart**

Project Directors: V. Faye Jones, Katie Leslie  
 Unit Business Manager: Brian J. Davis  
 Budget Period: 06/01/2014 to 12/31/2014  
 Project Period: 06/01/2014 to 12/31/2014

Item	Actual Expenses	Percentage
<b>Personnel -- Stipends</b>	\$ 653.85	
C. Calderon	\$ 163.46	
M. Casey	\$ 245.19	
A. Zolj	\$ 245.20	
<b>Personnel Total</b>	<b>\$ 653.85</b>	<b>26%</b>
<b>Travel Expenses -- Mileage</b>	\$ 1,846.15	
C. Calderon	\$ 445.20	
M. Casey	\$ 669.76	
A. Zolj	\$ 731.19	
<b>Purchased Services Total</b>	<b>\$ 1,846.15</b>	<b>74%</b>
<b>Grand Total</b>	<b>\$ 2,500.00</b>	