



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Understanding and Informing Community Emergency Cardiovascular Disease Preparedness during the COVID-19 Pandemic: Stroke Ready

Maria Cielito Robles, BS,* Casey L. Corches, MPH, MSOTR/L,*
Morgan Bradford, BS,* Tia S. Rice, MSHE,* Devraj Sukul, MD, MS,†
Mellanie V. Springer, MD, MS,* Sarah Bailey, MA,‡ Alina Oliver,§ and
Lesli E. Skolarus, MD, MS*

Introduction: Acute stroke and acute myocardial infarction (AMI) treatments are time sensitive. Early data revealed a decrease in presentation and an increase in pre-hospital delay for acute stroke and AMI during the coronavirus disease 2019 (COVID-19) pandemic. Thus, we set out to understand community members' perception of seeking acute stroke and AMI care during the COVID-19 pandemic to inform strategies to increase cardiovascular disease preparedness during the pandemic. *Methods:* Given the urgency of the clinical and public health situation, through a community-based participatory research partnership, we utilized a rapid assessment approach. We developed an interview guide and data collection form guided by the Theory of Planned Behavior (TPB). Semi-structured interviews were recorded and conducted via phone and data was collected on structured collection forms and real time transcription. Direct content analysis was conducted guided by the TPB model and responses for AMI and stroke were compared. *Results:* We performed 15 semi-structured interviews. Eighty percent of participants were Black Americans; median age was 50; 73% were women. Participants reported concerns about coronavirus transmission in the ambulance and at the hospital, hospital capacity and ability to triage, and quality of care. Change in employment and child-care also impacted participants reported control over seeking emergent cardiovascular care. Based on these findings, our community and academic team co-created online materials to address the community-identified barriers, which has reached over 8,600 users and engaged almost 600 users. *Conclusions:* We found that community members' attitudes and perceived behavioral control to seek emergent cardiovascular care were impacted by the COVID-19 pandemic. Community-informed, health behavior theory-based public health messaging that address these constructs may decrease prehospital delay.

Key Words: COVID-19—Community based participatory research—Rapid assessment process—Stroke—Myocardial infarction

© 2020 Elsevier Inc. All rights reserved.

From the *University of Michigan, Department of Neurology, Stroke Program, Ann Arbor, MI, USA; †University of Michigan, Department of Internal Medicine, Division of Cardiovascular Medicine, Ann Arbor, MI, USA; ‡Bridges into the Future, Flint, MI, USA; and §Bethlehem Temple Church, Flint, MI, USA.

Received September 20, 2020; revision received November 10, 2020; accepted November 14, 2020.

Address correspondence to Lesli E. Skolarus, MD, MS, University of Michigan, Department of Neurology, Stroke Program, Ann Arbor, MI, USA.

E-mail: lerusche@med.umich.edu.

1052-3057/\$ - see front matter

© 2020 Elsevier Inc. All rights reserved.

<https://doi.org/10.1016/j.jstrokecerebrovasdis.2020.105479>

Introduction

Acute stroke and acute myocardial infarction (AMI) treatments are available and reduce disability and mortality; however, their effectiveness is highly time-sensitive.^{1,2} In the setting of the coronavirus disease 2019 (COVID-19) pandemic, early data revealed a decrease in presentation and an increase in pre-hospital delay among patients experiencing an acute stroke or AMI.^{3,4} The state of Michigan has been severely impacted by COVID-19, with over 152,000 confirmed cases and 7,000 deaths as of October 22, 2020.⁵ We anticipate the number of cases and deaths to increase prior to and after publication of this manuscript.

COVID-19 has disproportionately impacted Black Americans in confirmed cases and deaths. Black Americans comprise about 14% of Michigan's population, but 19% of the COVID-19 cases and 36% of the deaths as of October 22, 2020.⁵ This increase in prevalence among Black Americans may further exacerbate current racial disparities in pre-hospital delay;⁶ compared to their white counterparts, Black Americans experience greater stroke and AMI pre-hospital delay, and lower treatment rates.^{7–10} Thus, in the context of an ongoing community-engaged, health behavior theory-based, peer educator-led, community-wide stroke preparedness intervention, Stroke Ready, we sought to understand the community perception of seeking acute stroke and AMI care during the COVID-19 pandemic. Due to the urgent clinical and public health implications, we opted to use a rapid assessment approach in order to inform ongoing and future public health campaigns both locally and nationally.

Methods

We utilized a community-based participatory approach, where academic and community partners collaborate in project conceptualization, study design, participant recruitment, review of analyses, material development and results dissemination.¹¹ Given the urgency of the clinical and public health situation, we also incorporated a rapid assessment approach—a real-time, participatory, iterative, mixed-methods approach to collecting and analyzing data and designing culturally appropriate interventions for health and social problems.¹² The accumulating national and international quantitative data⁴ confirmed our local community partners' impression of a decline in stroke presentations. Thus, we used a health behavior theory framework, the Theory of Planned Behavior, to understand the determinants of seeking emergency cardiovascular care during the COVID-19 pandemic which, in turn, informed public health material development. We performed semi-structured interviews from April 9 to May 7, 2020, during which the state of Michigan was under a 70-day “stay-at-home” order in response to the COVID-19 pandemic. This study was approved by the University of Michigan IRB.

Participants

We recruited participants from the Flint community, a city with a population of 100,000; 40% of whom live in poverty; and 57% are Black American. Recruitment was done through word-of-mouth via phone and community partner social media, followed by participant snowball sampling.

Interview guide

We developed an interview guide based on the Theory of Planned Behavior to assess stroke and AMI perceptions during COVID-19 and to understand the determinants of behavioral intent to call 911 (Appendix A).¹³ We queried participants on: 1) overall perception and knowledge of COVID-19 in order to contextualize our findings; 2) attitude towards stroke and AMI preparedness, subjective norms, and perceived behavioral control of stroke and AMI preparedness; and 3) information they thought would be helpful to address community specific barriers to seeking emergency care for stroke and AMI.

Data collection and rapid team-based analysis

To honor social distancing guidelines, we conducted all interviews virtually via HIPAA-approved teleconferencing. All interviews were conducted by a primary interviewer. Data collection was conducted by two real-time data collectors on structured data collection forms and real time transcription (Appendix B). Interviews were recorded with the plan to review the recordings if needed to supplement or confirm the real time data collection. Two reviewers performed data reduction followed by directed content analysis using the Theory of Planned Behavior as a template.¹⁴ Any discrepancy was discussed at academic-community partner team meetings. Responses for AMI and stroke were qualitatively compared. We then worked with our community partners to develop health behavior theory-based and behavior change strategy-informed¹⁵ online materials that addressed the community specific barriers to accessing emergency cardiovascular care.

Results

We reached thematic saturation after performing 15 semi-structured interviews with Flint community members. Eighty percent of participants were Black American; median age was 50; 73% were women and 47% reported some college education or above. The interviews were a mean duration of 40 minutes.

The majority of participants described a general understanding of COVID-19 transmission. Participants expressed concerns on risks for infection and death, both for them and those they knew, the lack of vaccine, and the general uncertainty around COVID-19.

Table 1. Application of the Theory of Planned Behavior Constructs to Understanding Emergency Cardiovascular Response during the COVID-19 Pandemic

| Construct: Intention to Perform the Behavior | |
|--|---|
| <ul style="list-style-type: none"> Response to acute stroke or AMI symptoms: Call 911 or go to the hospital | <ul style="list-style-type: none"> “I don’t want to have to go to the hospital or ER, but I would have to call 911.” |
| Drive or walk to the hospital | <ul style="list-style-type: none"> “First thing I would do is I would alert my wife that I’m experiencing problems and probably call 911.” “I wouldn’t call because I’m so close, I could walk.” “I would probably have my brother take me [to the hospital].” “Right now, I would probably say I would drive myself. Without coronavirus, I would take the ambulance.” |
| Severe or worsening symptoms and fear of dying were motivating factors for calling 911 | <ul style="list-style-type: none"> “I would call 911 if symptoms felt serious” “If you seriously have symptoms, but you still take a huge risk by going to hospital [<i>because of COVID-19</i>], but slightly lesser amount of risk.” |
| Hesitation in responding to symptoms during COVID-19 Pandemic | <ul style="list-style-type: none"> “I’d call the ambulance in a heartbeat if I thought I was dying.” “...the only thing that’d be different would be that I wouldn’t wait as a last resort to go to the hospital. [<i>Before the COVID-19 pandemic</i>] I would go earlier and not wait to see how bad it is.” |
| <ul style="list-style-type: none"> Difference in responses – stroke vs. AMI Greater perceived risk of death with AMI than Stroke | <ul style="list-style-type: none"> “I’ve had several members die of a heart attack, so I would definitely go.” “I think heart attack is worse than stroke. More likely to survive a stroke. A heart attack seems more serious than a stroke. Stroke disfigures your body, but you can back closer to normal. A heart attack is a death thing.” |
| Construct: Attitude Toward the Behavior | |
| <ul style="list-style-type: none"> Barriers to taking an ambulance during COVID-19: Concerns about contracting coronavirus in the ambulance | <ul style="list-style-type: none"> “I’d be worried about getting coronavirus from the ambulance. . .”; “I’d be skeptical because I wouldn’t know if they sanitized it after someone in there that might have had it [<i>COVID-19</i>].” |
| Fear of ambulances | <ul style="list-style-type: none"> “I’m terrified of the ambulance. Family members have died in an ambulance.” |
| Cost Time | <ul style="list-style-type: none"> “It’s [<i>taking an ambulance</i>] too expensive.” “I could get there [<i>to the hospital</i>] before them.” |
| <ul style="list-style-type: none"> Barriers to going to the hospital during COVID-19: Concerns about contracting COVID-19 at the hospital | <ul style="list-style-type: none"> “Hospitals are a hotspot for people with coronavirus and might put me in close contact with those people.” “I do not think hospital is disinfecting appropriately” “I think waiting in the waiting room with all of the coronavirus patients would be scary.” |
| Concerns about hospital’s capacity and triage capability | <ul style="list-style-type: none"> “My perception is that all hospitals are overwhelmed with cases and may not be best equipped to handle other emergencies.” “People are afraid of not being taken seriously or being turned away [<i>if they go to the hospital for a condition other than COVID-19</i>].” “It seems like there’d be a wait from what they say on the news.” |
| Concerns about quality of hospital care | <ul style="list-style-type: none"> “I don’t think they would look as far into it [<i>stroke symptoms</i>] as they should because of everything going on [<i>with coronavirus</i>].” “Nurses are being overworked, so I don’t feel the care is best with coronavirus going on.” |
| Construct: Subjective Norms | |
| Positive social norms Increased hesitancy from family members during COVID-19 | <ul style="list-style-type: none"> “They would still tell me to go to the hospital.” “Before the virus, they wouldn’t have hesitated to say to go to the hospital.” |

(Continued)

Table 1 (Continued)

| Construct: Subjective Norms | |
|---|---|
| <ul style="list-style-type: none"> • Bystander Response Increased hesitation in approaching someone with symptoms during COVID | <ul style="list-style-type: none"> - "I'd be more cautious with a stranger because I don't know them." - "I'd still stay a few feet away from them. If they were able to respond and tell me their symptoms, I would call 911." |
| Construct: Perceived Behavioral Control | |
| Fear of getting or dying from COVID-19 | <ul style="list-style-type: none"> - "They're afraid of dying [from coronavirus]." - "People have forgotten about other illnesses b/c they're scared of going to the hospital and getting coronavirus, and they're not able to go in with their loved ones." |
| Restrictions on visitors coming into the hospital Concerns related to symptom recognition | <ul style="list-style-type: none"> - "Fear is taking over. People don't want to die alone." - "I'd probably die because I don't know the symptoms." - "I'd try to talk myself out of it being a heart attack is it indigestion, or something else?" |
| Change in employment status impacting financial concerns | <ul style="list-style-type: none"> - "In general, it's pretty alarming. I used to bid on storage units and that paid a lot of my bills, but they shut that down. A tenant of mine got let go of their job and I don't know how it'll affect them or how it'll affect me" |
| Accessing and securing childcare | <ul style="list-style-type: none"> - "I just had a baby and have a 1 year-old. I wouldn't take them to the hospital. I'd have to have someone watch them" |

Guided by the Theory of Planned Behavior, we identified themes within each of the theoretical constructs (Table 1).

Intention to perform the behavior

The majority of participants stated they would call 911 for both stroke and heart attack symptoms, with severe or worsening symptoms being a motivating factor for response in both scenarios. However, participants reported greater hesitation to perform these immediate actions than prior to the pandemic. No differences in the intention to call 911 for acute stroke versus AMI symptoms were noted, yet differences in perceived risks and outcomes were different for most participants. Many felt there was a greater risk of dying from an AMI than with a stroke.

Attitude toward the behavior

Participants attitude toward calling 911 for a cardiovascular emergency was impacted by the COVID-19 pandemic. Participants reported concerns about the risk of contracting COVID-19 in the ambulance. Additional identified barriers to calling for an ambulance included cost as well as the perception of being able to get to the hospital quicker by driving oneself rather than taking an ambulance.

Participants also reported concerns regarding the hospital's ability to prevent the spread of COVID-19. Many were unsure of their risk of infection if they were to go to the hospital with a stroke or heart attack. In addition, participants were also concerned about hospital capacity and triage capability noting the possibility of longer wait times and receiving lower quality of care due to competing priorities of caring for COVID-19 patients.

Subjective norms

Before and during the COVID-19 pandemic, participants' behavioral intent was influenced by the belief that their family would want them to call 911 or go to the hospital if they were having symptoms of a stroke or heart attack. However, there would have been less hesitation pre-COVID-19.

Participants who reported they would call 911 for themselves would also call 911 if they witnessed stroke symptoms. However, even those who would not call 911 immediately for themselves reported that they would eventually call 911 or tell someone to call 911 for someone experiencing stroke symptoms. Participants also noted that due to present day conditions, they may try to keep their distance and make sure they are covered appropriately in order to prevent themselves from contracting COVID-19, whereas previously there would be no hesitation in approaching someone experiencing stroke symptoms.

Perceived behavioral control

Participant perceptions of their ability to seek emergent care during the COVID-19 pandemic was informed by individual- and system-level factors. These responses centered around their perceived power over factors impacting emergency response such as fear of getting or dying from COVID-19 and not being able to have visitors at the hospital. Several participants also mentioned that they were not confident in their ability to recognize symptoms and discussed the potential for incorrect symptom casual attribution, such as having symptoms of indigestion and mistakenly identifying it as a heart attack.

All participants whose employment status was negatively impacted by COVID-19 (n = 4, 27%) were concerned about their finances and reported this as a factor impacting their decision to go to the hospital. Additionally, two of the participants reported they had children and mentioned childcare was also a factor impacting their decision to go to the hospital to seek emergency care, since it would require them to find someone to care for their children.

Public health messaging recommendations

Participants’ clinical-based recommendations included “calling 911 is the #1 thing to start with” and emphasis on risk of not seeking immediate medical care, “long-term effects of having a stroke or heart attack if you don’t get treated.” In addition, participants recommended promotion of the hospitals’ sanitary conditions to decrease fear of ambulance and hospital-based COVID-19 transmission. Many participants also noted the importance of consistent messaging to combat misleading information of COVID-19 transmission; “leaders are not giving the right information; you wonder what the right information is.” Suggested mediums for messaging included social media for the working-aged, TV commercials and computerized “robo-calls” for older adults, and flyers, billboards and word-of-mouth for the general public.

Community-academic partner response

Based on these findings, our community and academic team co-created materials that addressed the community-identified barriers. Our Stroke Ready COVID-19 response materials primarily focused on attitude toward seeking emergent care during the COVID-19 outbreak through behavior change techniques of knowledge, self-belief, and goals and planning.¹⁵ Materials posted on our social media sites included fact sheets, photo infographics, informational videos and links to additional resources, which highlights: 1) stroke is always an emergency, even during the COVID-19 pandemic (Fig. 1); 2) “even if” messaging that address the community’s specific concerns (Fig. 2).

We also created an original COVID-19 stroke preparedness song, with the following lyrics: “stroke is an emergency all the time, even with COVID-19 / get to the hospital as soon as symptoms start, it’s so important to do your part / be Stroke Ready” (<https://youtu.be/iKefAiUM2W0>). From our first post on our community-academic partner Stroke Ready Facebook page on March 16 to August 1, 2020, our COVID-19 social media efforts reached over 8,600 users and engaged almost 600 users. Reach is defined as the number of unique users who saw our content, while engagement is the number of unique users that interacted with the content, such as sharing, liking or commenting. In March, we notified our followers that all in-person Stroke Ready workshops would be cancelled in accordance to state social-distancing recommendations. From



Fig. 1. Responding to stroke during COVID-19 fact sheet

March to April, we added COVID-19 public health messaging from sources such as the Center for Disease Control and Prevention (CDC) and Michigan.gov on ways to remain healthy and safe to our Stroke Ready social media platforms. Additionally, we shared information on resources our community partners identified, such as food delivery for homebound older adults and water distribution sites that were continuing operations. From May to July, while we continued to share COVID-19 related

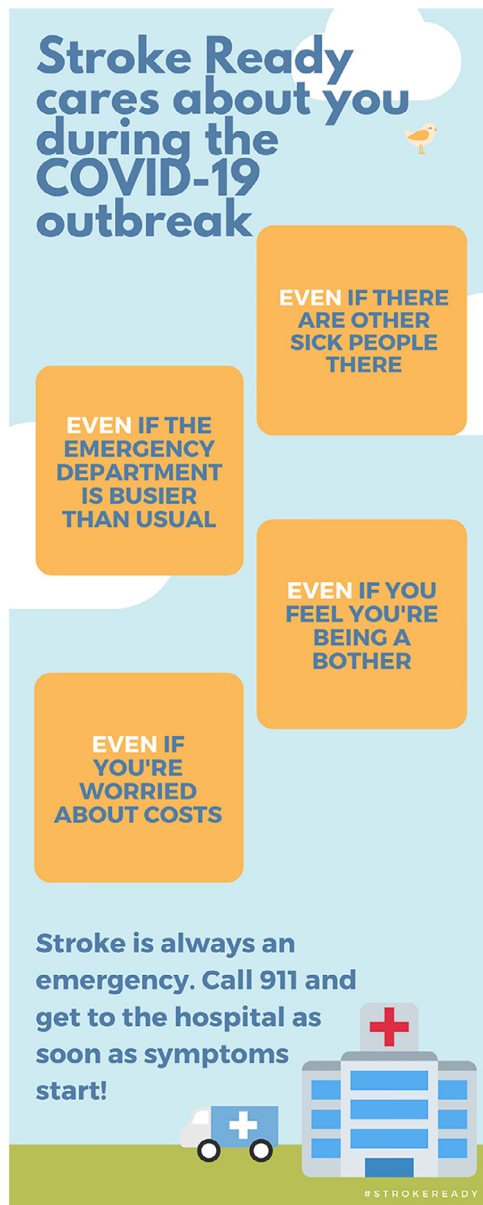


Fig. 2. Stroke Ready COVID-19 “even if” messaging

information and resources, we also incorporated our Stroke Ready COVID-19 response materials. Our messaging remained consistent—that stroke is an emergency and not to delay seeking care even during the pandemic. On May 20, we launched our COVID-19 stroke preparedness song and music video, which had reached 1,200 users by November 1, 2020.

Discussion

In this rapid assessment of community determinants of intent to access emergent care for stroke and AMI in the setting of the COVID-19 pandemic, we found that participants intend to seek emergent care, particularly for severe symptoms. However, compared to prior to the pandemic, many participants reported greater hesitation in calling

911. This greater hesitation was driven predominately by participants’ attitudes and perceived behavioral control over seeking emergent cardiovascular care. There was less of an impact due to subjective norms, although participants noted they would take greater precautions when assessing someone who may have had a stroke.

We found an unfavorable attitude towards seeking emergent cardiovascular care via the ambulance and at the hospital. Participants reported concerns about coronavirus transmission in the ambulance and at the hospital for both stroke and AMI, hospital capacity and ability to triage, and quality of care. Participants were concerned that the care of patients with COVID-19 would supersede that of stroke and AMI.

The social and economic impacts of the COVID-19 pandemic were noted to impact perceptions of behavioral control. Participants noted concerns about hospital policies such as, ‘no visitors’ as impacting their control over the situation. For participants with young children, the ability to secure childcare, especially now that schools and daycare are not in session, would be a factor in their decision to seek emergent care. Additionally, working-age participants who experienced furloughs or reduced work hours expressed financial concerns, such as the cost of ambulances. Addressing these barriers will likely require policy level initiatives at the hospital, local, state and national level.

Utilizing both a community-based participatory research and rapid assessment approach enabled us to identify relatively early in the COVID-19 pandemic that the public was not seeking emergency cardiovascular care, understand the community’s determinants, and create timely community-informed, health behavior theory-based, behavior change strategy materials. The rapid assessment approach provided a framework to integrate national quantitative with local qualitative data and facilitated qualitative data analysis. In addition, working in partnership with the community brought to our attention the possibility of community delays. Our community-academic partnership also facilitated participant recruitment during stay-at-home orders and the development and dissemination of community-relevant materials.

During the height of the COVID-19 outbreak in Michigan and under state imposed stay-at-home orders, in partnership with the Flint community, we co-created community informed Stroke Ready COVID-19 response materials. Implementation measures include reach for which over 8,600 people saw the materials and engagement for which almost 600 people shared or liked our Stroke Ready COVID-19 response materials. However, the ultimate question is whether the Stroke Ready COVID-19 response materials decreased pre-hospital delay and increased acute stroke treatments. At this point, we lack a definitive answer. This question will be informed by the final analysis of Stroke Ready where the acute stroke treatment rates of Flint will be compared with demographically

matched Michigan communities which will occur in the Summer/Fall 2021.

The following limitations warrant attention. Despite cognizance of the challenges of recruiting men, men were still under-represented in our study. Additional strategies such as intensifying community partners' efforts to recruit men and earlier focus on encouraging participants to identify men who may participate may provide more equitable gender-based recruitment. Our findings are limited to one predominately Black American community and may not represent other communities. Finally, interviews were conducted over the phone due to COVID-19 precautions.

Our findings reveal that community members' attitude and perceived behavioral control to seek emergent cardiovascular care were impacted by the COVID-19 pandemic. Community-informed, health behavior theory-based public health messaging that address these barriers through behavior change techniques may decrease prehospital delay and minimize missed opportunity to deliver time-sensitive treatments.

Declaration of Competing Interest

None

Grant Support: This project is funded by the Office of The Director, National Institutes of Health (OD) and the National Institute on Minority Health and Health Disparities (NIMHD) U01 MD010579.

Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:[10.1016/j.jstrokecerebrovasdis.2020.105479](https://doi.org/10.1016/j.jstrokecerebrovasdis.2020.105479).

References

1. Powers WJ, Rabinstein AA, Ackerson T, Adeoye OM, Bambakidis NC, Becker K, Biller J, Brown M, Demaerschalk BM, Hoh B. 2018 guidelines for the early management of patients with acute ischemic stroke: A guideline for health-care professionals from the american heart association/american stroke association. *Stroke* 2018;49:e46-e99.
2. O'Gara PT, Kushner FG, Ascheim DD, Casey DE, Chung MK, De Lemos JA, Ettinger SM, Fang JC, Fesmire FM, Franklin BA. 2013 accf/aha guideline for the management of st-elevation myocardial infarction: A report of the american college of cardiology foundation/american heart association task force on practice guidelines. *J Am Coll Cardiol* 2013;61:e78-e140.
3. Tam C-CF, Cheung K-S, Lam S, Wong A, Yung A, Sze M, Lam Y-M, Chan C, Tsang T-C, Tsui M. Impact of coronavirus disease 2019 (covid-19) outbreak on st-segment–elevation myocardial infarction care in hong kong, china. *Circ Cardiovasc Qual Outcomes* 2020;120:006631.
4. Uchino K, Kolikonda MK, Brown D, Kovi S, Collins D, Khawaja Z, Buletko AB, Russman AN, Hussain MS. Decline in stroke presentations during covid-19 surge. *Stroke* 2020;51:2544-2547.
5. Michigan.Gov coronavirus. https://www.michigan.gov/coronavirus/0,9753,7-406-98163_98173--,00.html. Accessed June 18, 2020.
6. Cummings C, Almallouhi E, Kasab SA, Spiotta AM, Holmstedt CA. Blacks are less likely to present with strokes during the covid-19 pandemic. *Stroke* 2020;51:3107-3111.
7. Messé SR, Khatri P, Reeves MJ, Smith EE, Saver JL, Bhatt DL, Grau-Sepulveda MV, Cox M, Peterson ED, Fonarow GC. Why are acute ischemic stroke patients not receiving iv tpa? results from a national registry. *Neurology* 2016. <https://doi.org/10.1212/WNL.0000000000003198>.
8. Hsia AW, Edwards DF, Morgenstern LB, Wing JJ, Brown NC, Coles R, Loftin S, Wein A, Koslosky SS, Fatima S, et al. Racial disparities in tissue plasminogen activator treatment rate for stroke. *Stroke* 2011;42:2217-2221.
9. Cavender MA, Rassi AN, Fonarow GC, Cannon CP, Peacock WF, Laskey WK, Hernandez AF, Peterson ED, Cox M, Grau-Sepulveda M, et al. Relationship of race/ethnicity with door-to-balloon time and mortality in patients undergoing primary percutaneous coronary intervention for st-elevation myocardial infarction: findings from get with the guidelines–coronary artery disease. *Clin Cardiol* 2013;36:749-756.
10. Bolorunduro O, Smith B, Chumpia M, Valasareddy P, Heckle MR, Khouzam RN, Reed GL, Ibebuogu UN. Racial difference in symptom onset to door time in st elevation myocardial infarction. *J Am Heart Assoc* 2016;5:e003804.
11. Israel BA, Eng E, Schulz AJ, Parker EA. *Methods for community-based participatory research for health*. Wiley; 2012.
12. McNall M, Foster-Fishman PG. *Methods of rapid evaluation, assessment, and appraisal*. *Am J Eval* 2007;28:151-168.
13. Ajzen I. Theories of cognitive self-regulation: the theory of planned behavior. *Organ Behav Hum Decis Process* 1991;50:179-211.
14. Manning K. Authenticity in constructivist inquiry: methodological considerations without prescription. *Qual Inq* 1997;3:93-115.
15. Michie S, Richardson M, Johnston M, Abraham C, Francis J, Hardeman W, Eccles MP, Cane J, Wood CE. The behavior change technique taxonomy (v1) of 93 hierarchically clustered techniques: Building an international consensus for the reporting of behavior change interventions. *Ann Behav Med* 2013;46:81-95.