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Informing Policy for Reducing Stroke Health Disparities from the Experience of African American Male Stroke Survivors

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Abstract

Background—The burden of stroke is severe among African Americans. Despite overall declines in the rate of stroke since 2000, outcomes are largely unimproved or have worsened for African American men. Adverse psychosocial challenges may hinder adherence to a regimen of risk factor reduction.

Methods and Results—Focus group analysis was combined with a review of current published guidelines and epidemiologic evidence on risk factors to better understand stroke health disparities and potential policy solutions. Transcripts from three focus groups with 10 African American male stroke survivors under age 65 and their care partners (N=7) were analyzed and compared with existing published data on (a) the burden of stroke (b) trends in clinical risk factors and (c) trends in behavioral risk factors. Participants described myriad psychosocial barriers that impede reduction of risk indicators, including low trust in providers, poor social support, access difficulties, depression and distress.

Conclusions—In order to be effective, policies and programs must target mechanisms consistent with the challenges faced by African American men. Infrastructure is needed to better identify and share practices effective for improving cardiovascular outcomes within specific racial and ethnic groups.

Keywords

Stroke; Health Disparities; Policy; Qualitative; Risk Factors

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Compliance with Ethical Standards:

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Informed consent: Informed consent was obtained from all individual participants included in the study.

INTRODUCTION

Public policy is at the forefront of efforts to improve public health and safety and to reduce racial and ethnic disparities in health care and health outcomes. African Americans, however, are more likely to die of most diseases, more likely to get deadly diseases, and have shorter life expectancy and higher infant mortality than other Americans [1]. African Americans have strokes at younger ages than whites, have double the stroke rate and more difficulty in recovering from stroke than other racial and ethnic groups [2]. A South Carolina study found an overall decline in the incidence of stroke since 2000, with the notable exception that young African American men are the only group to have had an *increase* in stroke (of 17.5%) in the period from 2000 to 2010 [3].

Widespread promotion and implementation of clinical practice guidelines is a frequently endorsed route to reducing stroke disparities. Since the mid-1990's The American Heart Association (AHA) has been a leader in promoting and disseminating evidence-based guidelines for care of stroke patients [4]. Despite the effectiveness of "Get with the Guidelines" (GWTG) at reducing inpatient racial and ethnic disparities in *care processes*, major gains in cardiovascular disease *outcomes* remain elusive [5,6].

Now more than a decade later, AHA stroke statistics show continued troubling data about the possibilities of the current GWTG efforts to reduce stroke, stroke recurrence and stroke mortality among African American men [2,5]. In 2008, stroke prevalence among African American men was 4.3%, nearly double that of all other racial and ethnic categories (2.4% for whites, 2.3% for Hispanics) [5, 6]. The worst disparity can be found in the age adjusted incidence of stroke; among men aged 45 to 64, African Americans have an annual stroke incidence of 9.7% compared with just 2.4% for whites. Survival also continues to be worse among African American males 45 to 64, with 36% mortality after 5 years compared with 25% for white males [5–7].

National efforts to address this disparity have found some success in improving inpatient care processes, but these gains have been insufficient to influence the overall stroke disparity faced by African American men [8, 9]. There is an imminent need to address this persistent and increasing health disparity, yet little is known about the mechanisms by which these disparities persist and few efforts have been made to make policy linkages to the lived experience of stroke for African American men under the age of 65 [10, 11].

African American men face social and psychological challenges that stand in the way of adherence to a regimen of risk factor reduction [10, 11]. These challenges exist in the context of broader social determinants of health. Theories including Fundamental Cause Theory and Cumulative Advantage/Disadvantage Theory have sought to explain how large gains in population health overall co-occur with the creation and perpetuation of health disparities for other groups [12]. According to these theoretical perspectives social inequalities selectively impede access to dramatic advances in the treatment and prevention of disease throughout the life course. For example, Dupre found that the influence of low educational attainment on risk behaviors and health outcomes is amplified as people reach

old age [13]. The current study combines findings from published literature with qualitative observations from a study of stroke recovery in African American men in order to better articulate the powerful mechanisms that constrain risk factor reduction.

Qualitative methods, including focus groups are an effective method for understanding the perspectives and experiences of patients, and have been recently been used to understand determinants of use of 911 service for stroke emergency among urban African Americans [14]. African American men are often overlooked and underrepresented in research [15–18]. The group format of focus groups, as a “collective conversation” is useful for understanding perspectives and preferences as expressed in interactions with others who have had a shared or similar experience [19]. Thoughts and ideas expressed in this setting can contain rich details not typically observed or elicited in survey or clinical studies. Qualitative evidence can help guide policy makers and clinicians to a more patient-centered understanding of the priorities, lived experiences and local contexts within which people face disparities. The Institute of Medicine’s 2012 workshop report, “*How Far Have We Come in Reducing Health Disparities?*” identified the need for a “fresh approach to research” that involves individuals from disadvantaged backgrounds in a process of building evidence-based interventions and policy solutions [20]. Researchers have further suggested that enlisting the help of community members in moving toward health disparities solutions is necessary [21]. In this paper, we examine existing literature investigating stroke disparities in African American men, summarize a qualitative analysis of AA men with stroke, and make comparisons in order to inform policy recommendations based upon these observations.

METHODS

This was a qualitative, observational study in which the results of focus group analysis were compared with existing published data on (a) the burden of stroke among African American men (b) trends in the contribution of clinical risk factors to this burden and (c) trends in the contribution of behavioral risk factors known to increase stroke risks. Our method of comparing existing published quantitative data with qualitative focus group data is a new approach to mixed methods, intended to fill a gap in current understandings of stroke disparities for African American men. This study was approved by the University Hospitals Institutional Review Board. Informed consent was obtained from all individual participants included in the study.

Summary Evidence from the Literature on Risk Factors

Specific stroke risk factors that can be targeted have been well described in the literature. We chose to base this analysis primarily on risk factor data from two studies, selected due to their large size and rigorous attention to measurement and comparison of stroke risk. The INTERSTROKE study is a case control study based on data from 6000 individuals in 22 countries and has identified the ten primary risk factors that account for 90% of the incidence of stroke [22]. Cases in INTERSTROKE were enrolled in hospital after an acute first stroke and were within 5 days of symptom onset at the time of data collection. Cases were matched by age and sex to hospital and community based controls who had no history of stroke. Evidence from the REasons for Geographic and Racial Differences in Stroke

(REGARDS) longitudinal cohort study, which includes nearly 30,000 individuals, more than 40% of whom are African American is further incorporated to provide a quantitative foundation for comparison with more experiential focus group insights [23]. The REGARDS study is a community based sample, and 50% of the participants are from the Stroke Belt or Stroke Buckle; individuals who were non-African American or non-white were excluded [23]. Information from these two studies was further supplemented with information extracted from the AHA stroke updates [2,5].

Focus Group Methods

Data on barriers that can point to potential policy strategies for reducing population risk factors and the concomitant burden of stroke were collected as part of the NINR-funded study, “Targeted Management Intervention for African-American Men with TIA or Stroke (TEAM Study; 1R21NR013001) [10]. In the TEAM study, we conducted a series of three advisory panel meetings, using focus group methods, with 10 African American male stroke survivors and their care partners (N=7) [10]. The purpose of the focus groups was to learn from stroke survivors and their care partners about the most salient barriers and facilitators to stroke prevention and recovery for younger African American men.

Eligible participants were self-identified African American males under the age of 65 with a post stroke or TIA discharge to home in the past 12 months, and Barthel Index (BI) score of > 60 [24–26]. Care partner (CP) participation was preferred but not required. Average age of the AA male stroke/TIA survivors was 53 (range =34–64) with seven having had an ischemic stroke and 3 having had a TIA. Participants were recruited from local tertiary care medical center acute stroke and acute stroke rehabilitation units, and other local primary and specialty health care settings.

Focus groups were conducted by a moderator and two facilitators using a semi-structured interview guide, with structured probes and planned discussion activities for participants. Prompts engaged participants in discussion with each other and they were encouraged to state whether they agreed or disagreed with the views of other participants. A flip chart and markers were used to highlight and summarize the ideas of the participants. The interview guides (available upon request from the authors) encouraged participants to describe the factors they felt were relevant to the experiences of having a stroke and receiving health care. A special focus was placed on those experiences that interfered with participants’ ability to adhere to risk factor reduction recommendations, such as those described in INTERSTROKE [22] and REGARDS [23,27]. Each session was approximately 90 minutes in length. All participants were explicitly informed that their ideas and opinions as part of the advisory panel would shape the structure and content of a stroke intervention for African American men.

Coding and Analysis

All focus groups and advisory board meetings were audio recorded and transcribed verbatim. Debriefing sessions among study staff after each focus group were also audio-recorded and transcribed. Verbatim transcripts were analyzed using a thematic constant comparative method [28, 29]. Study investigators (CB, MS, JC) independently coded each

transcript and constructed and refined a dictionary of mutually exclusive themes [30]. At a subsequent meeting of participants, a member check was conducted to assess internal validity of the thematic findings [31]. Further analytic details are published elsewhere [10].

In order to understand the extent to which existing health policy priorities adequately address the day-to-day barriers experienced by African American men who have had a stroke, we used a concept mapping technique in which the exhaustive list of themes from the focus group data were mapped to risk factor reduction policy statements in the published literature [32]. This technique involved a back and forth of inductive reasoning from thematic evidence in the focus group data, and deductive reasoning motivated by the INTERSTROKE and REGARDS results [22, 23, 27]. For example, direct quotations from participants coded under theme of medication adherence were compared with results and evidence in the literature for the effectiveness of medication in reducing risk of stroke. In this manner, the taxonomy of themes from coded transcripts was studied together with prior evidence on risk factors to synthesize a new understanding of stroke disparities. Thus the results section is a combination of this prior evidence and participant contributions.

RESULTS

Trends in Stroke Risk Factors

Comparative data on behavioral risk factors indicate that while differences exist, individual risk behaviors are unlikely to be solely responsible for the stark difference in stroke burden among younger African American men [5]. Rates of smoking were slightly lower for African American than for white men (21.6% vs 22.0%). Rates of engagement in recommended physical activity were similar for African American and white men (23.7% vs. 26.0%). Nutrition results showed that African American men ate fewer calories (2365 vs. 2532), consumed slightly lower total and saturated fat, but consumed far fewer fruits and vegetables and far more sodium than white men.

Clinical Epidemiologic Trends

In contrast, clinical indicators show a poorer profile for African American males than white males. Although African Americans males had *lower* rates of hyperlipidemia (38.6% vs. 40.5%), they had *higher* rates of hypertension (42.6% vs. 33.4%) and were *more likely* to be obese (37.0% vs. 32.1%) than white males [5]. Some co-morbid conditions were more common in African American men than in white men including diabetes (13.5% vs 7.7%) and heart failure (4.1% vs. 2.5%) while other co-morbid conditions had lower rates for African American men than white men, including myocardial infarction (3.9% vs. 4.4%), coronary heart disease (6.8% vs. 8.2%) and angina pectoris (2.4% vs. 3.3%). Of further importance are additional results from the REGARDS study showing that despite being more likely than whites to be aware of their hypertension *and* more likely to be on a blood pressure medicine, African Americans were less likely to have their blood pressure controlled [27, 33].

Most striking is that from the 2012 to the 2014 AHA report, African Americans improved relative to whites in key stroke risk factor areas, including smoking and hypertension (the

two strongest risk factors for stroke) and yet the rate of stroke among African Americans remained unchanged and persistently higher than for whites and other racial and ethnic groups [5, 6]. These statistics suggest the presence of additional, powerful barriers to stroke care and prevention among African American men, beyond the traditional risk factors targeted by GWTG efforts.

Focus Group Results: Psychosocial Barriers Constrain Stroke Risk Reduction

The ability of individuals to adhere to stroke prevention guidelines is often constrained by psychosocial factors. First proposed over 3 decades ago, Engel's biopsychosocial model is still highly relevant to stroke care [34, 35]. In 1980, Engel described clearly how adverse social and psychological circumstances, and a health care system that largely ignores these circumstances, prevented a particular patient (Mr. Glover) from receiving appropriate secondary prevention [34]. Family and employment structures were barriers to Mr. Glover receiving appropriate cardiovascular disease treatment.

Table 1 presents the magnitude of stroke risk factors from the INTERSTROKE study [22] together with barriers to risk factor reduction described in the TEAM study [10]. Table 1 pairs the consensus evidence on stroke risk factors, with some of the most difficult barriers described by African American men and care partners in the TEAM study when asked about their efforts to live healthy and reduce stroke risk [11]. Data from the REGARDS study has similarly found that adherence to the AHA's "Life's Simple 7" (an index including improved glucose control, cholesterol, blood pressure, body mass index, physical activity, diet and reduced cigarette smoking) is associated with lower incidence of stroke among both whites and African Americans. Focus group data presented below suggest that many factors constrain these simple guidelines [36].

General Challenges faced by African American Men

When asked about what to focus on and how to better present information and promote healthy living for African American men, the participants described a lack of information that focused on their concerns.

And among African American, Black men, we are not getting, the information is not there. Period. It's nothing on television, there's nothing coming through the mail, there's no uh email, there's no uh commercial, there is absolutely nothing. (Participant 7)

They also felt that a higher level of ethnic and cultural understanding was necessary in order to provide better care, and that culturally appropriate communication is required.

If you don't know anything about Black people then, you just talking mumble jumble to us. I mean, at least for me it is. I'm a straight shooter, so if you want to talk to me about certain things you have to at least know something about Black people. If you don't know nothing about Black people, what Black people are going through in this day and age then how [do] you apply that to your medical care and how you take care of yourself? (Participant 8).

Medication

Medications for high blood pressure and high cholesterol are at the foundation of stroke prevention. While the act of taking a pill, in and of itself, is not a complicated one, multiple psychological and social barriers can combine to form a near impenetrable barrier to medication management of hypertension and hyperlipidemia. A patient may not fully understand the benefits of a medication [37, 38]. In isolation the level of knowledge about medications might represent only a small challenge. The same patient might also be struggling with a tobacco addiction and having difficulty in being able to find the money to pay for refills of a statin, two anti-hypertensive medications and a nicotine patch. Barriers to accessing providers can translate into barriers to obtaining medication refills (i.e. long waits in the at the point of care and at the safety net clinic pharmacy). As in the illustrative quotations in the first row of Table 1, perhaps most detrimental is that some younger African American males have low trust in their health care team, evidenced by speculation about whether the doctor might be receiving kickbacks from pharmaceutical companies.

Nutrition and Diet

Dietary changes are recommended for most patients at risk for cardiovascular disease, but advice to reduce salt, eat a low fat diet and other dietary changes must be integrated into the lifestyle and social circumstances of a patient. During one of the focus groups, when presented with the healthy plate [39] several men said that their plate had never looked like that, and probably never would. They expressed concern about being able to afford the high quality foods depicted as well as about having to abandon their cultural ties to certain types of foods.

“I don’t know, it’s kind of hard for me because, you know, growing up on soul food all my life and it’s kind of hard for me.” (Participant 2)

Exercise and Weight Loss

Key barriers to exercise described by participants were a combination of post stroke functional limitations, lack of confidence in their ability to exercise effectively, and inadequate physical environments for exercise.

“You got to mention that straight upfront because the stress is going to determine, uh the level of uhm of how you live your lifestyle.” (Participant 4).

Smoking and Alcohol Use

Nearly all of the focus group participants reported having worked toward quitting or reducing their smoking and alcohol use. A highlight of these discussions was a clear description of how post-stroke physical and health behavior changes were disruptive to each man’s social and life routines.

“One thing I notice is that since I had the stroke I have a lower tolerance for alcohol. I have a tendency to be close to what you would call drunk off of a small amount of alcohol. My system doesn’t tolerate it anymore. I drink beer now, and before it might have been uhm cognac, but now I find that uhm if I have both that’s too much.” (Participant 2)

Even successful attempts to reduce risk factors are met with isolating disruption to social life. Friendships and behaviors with a rich personal history can be disrupted by illness and by changes to healthy and lifestyle decisions after stroke. One participant described a cycle of social isolation and disengagement that was echoed by others in the group.

“It wasn’t just because of the stroke only. I grieved to see how people leave you when you’re distressed, and I sat there of all the people I helped not one showed up. Not one soul showed up. They couldn’t look at me, wouldn’t even come by. Had one friend tell me, I hate to see you in this situation [so] I don’t come by. I guess the people associate sickness with me.” (Participant 3)

Depression and Psychosocial Stress

Participants in the focus group sessions emphasized the overriding influence of psychosocial stress, both daily and cumulative, on their ability to engage in effective self-management practices.

“I focus on what’s going on with African American men, and one of the reasons why we are having so, so much stress I think a lot of stuff is deal, dealing with stress and social issues ... When you start talking about it towards African American men you got to be, the stress got to be at least 75 to 80 percent of why we even had a stroke.” (Participant 6)

Another participant described clearly how living in an unsafe neighborhood created distress and made it more challenging to handle a complex health maintenance routine after having had a TIA:

“I wanted to say mine is more paranoia, like if I walk out of here and I know I will be worried or paranoid, [of] getting robbed, or different things like that. And then I’m already going through this situation with my health. Where I’m trying to watch out for myself, and I have to watch constantly where I’m going outside.” (Participant 9)

Combined Risks

Notable is that the risks in Table 1 can interact and likely create a destructive cycle of risk escalation for African American men. For example, a man who understands the risks of high blood pressure might be unable to visit his doctor because of a provider shortage in his community or lack of good health insurance. The fact that he faces and is unable to overcome this barrier may be frustrating and lead to psychological distress and chronic inflammation, further compounding his serious health condition.

Disadvantages experienced socially are overlapping, become embodied and are manifest in poorer health. In the REGARDS study, c-reactive protein (a biomarker of inflammation associated with repeated experiences of acute and traumatic stress) was associated with a higher risk of pre-hypertension [40]. For nearly all of the African American men in the TEAM study focus groups, risk factors were seldom experienced in isolation and instead clustered together.

Based on probability coefficients from the INTERSTROKE study a man who engages in 0 out of 9 protective health behaviors in Table 1 has an increased odds of stroke of 15.3 [22]. The reality of the situation described in Table 1 is that even if health policy could guarantee same-day appointments and free medications for all, important barriers would remain and many African American men would still face very difficult, if not personally insurmountable challenges to stroke prevention.

DISCUSSION

The results of the focus groups, in the context of the literature on stroke risk for African Americans provide a poignant description of the socially embedded mechanisms through which stroke disparities are created and maintained. Our findings are consistent with theories of health inequality, including fundamental cause theory and cumulative advantage/disadvantage (CAD) theory [41, 42]. The key proposition of fundamental cause theory is that deleterious conditions of society, including poverty, inequality, social isolation and the distress caused by these circumstances are fundamental causes of disease [42]. This proposition has been confirmed previously with demonstrated inequality in stroke incidence, reduced level of in-hospital stroke services, and poorer stroke outcomes [43–46].

Participant experiences were consistent with CAD theory which suggests that as a person ages, a combination of biological, social and random factors influence their trajectory of well-being [41, 47–50]. The lives of persons of lower education, living in poverty and from racial and ethnic minority backgrounds are more likely to be characterized by disadvantage which becomes embodied in the form of chronic inflammation and an increasing burden of chronic disease. A lifetime of social and health disadvantage leads to 1) greater likelihood of having a stroke 2) greater stroke severity 3) poorer quality of health services received in response to stroke 4) a steep, uphill climb to stroke recovery and 5) higher post stroke mortality. For example, the landmark Scottish cohort study demonstrated that men whose fathers were of lower socioeconomic status had a higher likelihood of experiencing and of dying from stroke [51]. Even controlling for risk behaviors the powerful constraints persist: “Improving one’s social position does not remove the effect of adverse social circumstances in childhood on stroke risk.” [51].

The focus group evidence presented from the experiences of African American men, combined with our knowledge of the persistence of stroke disparities suggests that further policy changes are needed to combat the compounding influence of psychological and social barriers on stroke outcomes. Socioeconomic conditions are a key factor perpetuating racial and ethnic stroke disparities. The burden of stroke and stroke mortality is linked to childhood socioeconomic conditions for both whites and African Americans [52] and policies that reduce social inequalities are likely to reduce disparities in stroke for African American men.

The experiential concerns of African American male stroke survivors suggests that a combination of community investment, clinical programs and care restructuring are likely needed to reduce racial and ethnic disparities in stroke outcomes. Despite accrued disadvantages, a healthy risk factor profile in adulthood mediates deleterious socioeconomic

conditions [52]. Fiscella in 2011, highlighted several strategies including improved access to care, revitalization of primary care, technological improvements and payment reform [53]. Key to these potential solutions is the focusing and alignment of US health care resources with the needs and preferences of racial and ethnic minority patients.

The benefits of programs that simply seek to educate ethnic minorities about stroke are unclear [54]. However, more intensive programs involving peers and partnerships, like health navigators have demonstrated efficacy at reducing the burden of cardiovascular disease [55]. Such programs target key mechanisms consistent with the challenges faced by African American men, such as low trust in providers, low knowledge, access difficulties and poor self-efficacy.

Infrastructure is needed to better identify and share the specific practices that can be effective for improving cardiovascular outcomes within specific racial and ethnic groups. A one-size fits all approach has historically been ineffective and more flexible, adaptive approaches are warranted. Hybrid approaches, combining community and clinical resources have been highlighted as a potentially effective mechanism for reducing racial and ethnic health disparities [56]. These approaches might include community targeted primary prevention [57], community-based hypertension management programs [58], and promotion of better communication with patients from diverse backgrounds through payment incentives [59,60]. A network for sharing successful strategies that emerge locally could be particularly effective for disseminating community based solutions. One focus group participant clearly delineated the need for health care organizations to rethink care delivery processes and build stronger connections with community members:

It takes a real, another person that had a stroke tell another person that you need to take your medication, you do this, you make your doctors visits. I think you gotta make sure it's awareness, you know, "Look man you don't really want to be like the way I was." I think that catches their attention. You know, I think going to the doctor, oh you gotta take this pill this, that, that is not really essentially getting it done. Participant 1

Given the challenges (financial, political, evaluative, administrative) to implementing transformative policy solutions that effect change and reduce stroke disparities, a piggyback approach that builds on existing successes is a potentially expedient and efficient pathway. For example, regional health improvement collaboratives guided by principles of quality improvement have had tremendous success in sharing locally effective solutions, including sharing of health information technology, improved care processes, reduction in rehospitalizations, and other successes [61–63]. Health disparities care improvement collaboratives have already enjoyed success in addressing diabetes disparities and such collaboratives could have a similar influence in reducing stroke health disparities by partnering directly with representatives from disadvantaged communities [64, 65]. An important feature of these efforts is the close tie to communities and a focus on sustainability [66].

There are several important limitations to our work. The data were collected from a purposive sample of African American men who had a stroke or TIA, and consist of insights

from persons who were interested in participating. We are unable to discern whether non-participants would share the same perspectives as the participants. The sample size was small and all participants are from Cleveland, Ohio. It is unknown whether the expressed perspectives and experiences would be found in other samples at other sites, but such a line of inquiry is likely to be fruitful. The frequency and magnitude of thematic results cannot be inferred from the focus group data. Nevertheless, our findings are consistent with existing theories of cumulative disadvantage and the fundamental causes of disease and warrant consideration in future empirical and policy oriented projects.

This study has attempted to triangulate a pathway to policy solutions that eliminate continued stroke health disparities experienced by African American men. Future work utilizing a broad range of research methods is necessary to continue to understand the texture and range of experiences that coalesce to place vulnerable groups at a lifelong, and often disastrous, health disadvantage. If the challenges faced by individuals are re-envisioned as challenges to be faced together as a society and a health care system we can begin to grasp and realize effective policy solutions.

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References Cited

1. AHRQ. 2012 National Health Care Disparities Report. 2012.
2. Go AS, Mozaffarian D, Roger VL, Benjamin EJ, Berry JD, Borden WB, Bravata DM, Dai S, Ford ES, Fox CS, Franco S, Fullerton HJ, Gillespie C, Hailpern SM, Heit JA, Howard VJ, Huffman MD, Kissela BM, Kittner SJ, Lackland DT, Lichtman JH, Lisabeth LD, Mackey RH, Magid DJ, Marcus GM, Marelli A, Matchar DB, McGuire DK, Mohler ER, Moy CS, Mussolunio ME, Nichol G, Paynter NP, Schreiner PJ, Sorlie PD, Stein J, Turan TN, Virani SS, Wong ND, Woo D, Turner MB. Heart disease and stroke statistics--2013 update: a report from the American Heart Association. *Circulation*. 2013; 127:e6–e245. [PubMed: 23239837]
3. Boan A, Feng W, Ovbiagele B, Bachman D, Ellis C, Adams R, Kautz S, Lackland D. Persistent racial disparity in stroke hospitalizations and economic impact in young adults in the buckle of the stoke belt. *Stroke*. 2014; 45:1932–1938. [PubMed: 24947293]
4. LaBresh KA, Ellrodt AG, Gliklich R, Liljestrand J, Peto R. Get with the guidelines for cardiovascular secondary prevention: pilot results. *Archives of Internal Medicine*. 2004; 164:203–9. [PubMed: 14744845]
5. Go AS, Mozaffarian D, Roger VL, Benjamin EJ, Berry JD, Blaha MJ, Dai S, Ford ES, Fox CS, Franco S, Fullerton HJ, Gillespie C, Hailpern SM, Heit JA, Howard VJ, Huffman MD, Judd SE, Kissela BM, Kittner SJ, Lackland DT, Lichtman JH, Lisabeth LD, Mackey RH, Magid DJ, Marcus GM, Marelli A, Matchar DB, McGuire DK, Mohler ER, Moy CS, Mussolunio ME, Neumar RW, Nichol G, Pandey DK, Paynter NP, Reeves MJ, Sorlie PD, Stein J, Towfighi A, Turan TN, Virani SS, Wong ND, Woo D, Turner MB. Heart disease and stroke statistics--2014 update: a report from the American Heart Association. *Circulation*. 2014; 129:e28–e292. [PubMed: 24352519]
6. Roger VL, Go AS, Lloyd-Jones DM, Benjamin EJ, Berry JD, Borden WB, Bravata DM, Dai S, Ford ES, Fox CS, Fullerton HJ, Gillespie C, Hailpern SM, Heit JA, Howard VJ, Kissela BM, Kittner SJ, Lackland DT, Lichtman JH, Lisabeth LD, Makuc DM, Marcus GM, Marelli A, Matchar DB, Moy CS, Mozaffarian D, Mussolunio ME, Nichol G, Paynter NP, Soliman EZ, Sorlie PD, Sotodehnia N,

- Turan TN, Virani SS, Wonf ND, Woo D, Turner MB. Executive summary: heart disease and stroke statistics--2012 update: a report from the American Heart Association. *Circulation*. 2012; 125:188–97. [PubMed: 22215894]
7. Howard VJ, Kleindorfer DO, Judd SE, McClure LA, Safford MM, Rhodes JD, Cushman M, Moy CS, Soliman EZ, Kissela BM, Howard G. Disparities in stroke incidence contributing to disparities in stroke mortality. *Annals of neurology*. 2011; 69(4):619–627. [PubMed: 21416498]
 8. Cohen MG, Fonarow GC, Peterson ED, Moscucci M, Dai D, Hernandez AF, Bonow RQ, Smith SC Jr. Racial and Ethnic Differences in the Treatment of Acute Myocardial Infarction Findings From the Get With The Guidelines–Coronary Artery Disease Program. *Circulation*. 2010; 121:2294–2301. [PubMed: 20479153]
 9. Schwamm LH, Fonarow GC, Reeves MJ, Pan W, Frankel MR, Smith EE, Ellrodt G, Cannon CP, Liang L, Peterson E, Labresh KA. Get With the Guidelines–Stroke is associated with sustained improvement in care for patients hospitalized with acute stroke or transient ischemic attack. *Circulation*. 2009; 119:107–115. [PubMed: 19075103]
 10. Blixen C, Perzynski A, Cage J, Smyth K, Moore S, Sila C, Pundik S, Sajatovic M. Stroke recovery and prevention barriers among young African-American men: Potential avenues to reduce health disparities. *Topics in Stroke Rehabilitation*. 2014; 21:432–442.
 11. Blixen C, Perzynski A, Cage J, Smyth K, Moore S, Sila C, Pundik S, Sajatovic M. Using focus groups to inform the development of stroke recovery and prevention programs for younger African-American (AA) men. *Topics in Stroke Rehabilitation*. 2015; 22:221–230. [PubMed: 26084323]
 12. Phelan JC, Link BG. Controlling disease and creating disparities: a fundamental cause perspective. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*. 2005; 60:S27–S33.
 13. Dupre ME. Educational differences in health risks and illness over the life course: A test of cumulative disadvantage theory. *Social Science Research*. 2008; 37:1253–1266. [PubMed: 19227701]
 14. Skolarus LE, Murphy JB, Zimmerman MA, Bailey S, Fowlkes S, Brown DL, Lisabeth LD, Greenberg E, Morgenstern LB. Individual and community determinants of calling 911 for stroke among African Americans in an urban community. *Circulation: Cardiovascular Quality and Outcomes*. 2013; 6:278–283. [PubMed: 23674311]
 15. Braunstein JB, Sherber NS, Schulman SP, Ding EL, Powe NR. Race, medical researcher distrust, perceived harm, and willingness to participate in cardiovascular prevention trials. *Medicine*. 2008; 87:1–9. [PubMed: 18204365]
 16. Cruz-Flores S, Rabinstein A, Biller J, Elkind MS, Griffith P, Gorelick PB, Howard G, Leira EC, Morgenstern LB, Ovbiagele B, Peterson E, Rosamond W, Trimble B, Valderrama AL. Racial-Ethnic Disparities in Stroke Care: The American Experience A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association. *Stroke*. 2011; 42:2091–2116. [PubMed: 21617147]
 17. Shavers-Hornaday VL, Lynch CF, Burmeister LF, Torner JC. Why are African Americans under-represented in medical research studies? Impediments to participation. *Ethnicity & health*. 1997; 2:31–45. [PubMed: 9395587]
 18. Shavers VL, Lynch CF, Burmeister LF. Racial differences in factors that influence the willingness to participate in medical research studies. *Annals of epidemiology*. 2002; 12:248–256. [PubMed: 11988413]
 19. Kamberelis, G.; Dimitriadis, G. *The Sage Handbook of Qualitative Research*. 3. Vol. 20020. Sage Publications; 2005. Focus groups; p. 887-908.
 20. Institute of Medicine (US). *How Far Have We Come in Reducing Health Disparities? Progress Since 2000: Workshop Summary*. Washington (DC): National Academies Press (US); 2012. A, Workshop Agenda. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK114238/>
 21. Horowitz CR, Lawlor EF. Community approaches to addressing health disparities. Report for the Institute of Medicine. 2008
 22. O'Donnell MJ, Xavier D, Liu L, Zhang H, Chin SL, Rao-Melacini P, Rangarajan S, Islam S, Pais P, McQueen M, Mondo C, Damasceno A, Lopez-Jaramillo, Hankey GJ, Dans AL, Yusuf K, Truelsen

- T, Diener HC, Sacco RL, Ryglewicz D, Czlonkowska A, Weimar C, Wang X, Yusuf S. Risk factors for ischaemic and intracerebral haemorrhagic stroke in 22 countries (the INTERSTROKE study): a case-control study. *Lancet*. 2010; 376(9735):112–23. [PubMed: 20561675]
23. Howard VJ, Cushman M, Pulley L, Gomez CR, Go RC, Prineas RJ, Graham A, Moy CS, Howard G. The reasons for geographic and racial differences in stroke study: Objectives and design. *Neuroepidemiology*. 2004; 25(3):135–143. [PubMed: 15990444]
 24. Kasner SE. Clinical interpretation and use of stroke scales. *Lancet neurology* Jul. 2006; 5:603–612.
 25. Mahoney FI, Barthel DW. Functional Evaluation: The Barthel Index. *Maryland state medical journal*. Feb.1965 14:61–65. [PubMed: 14258950]
 26. Wade DT, Collin C. The Barthel ADL Index: a standard measure of physical disability? *International disability studies*. 1988; 10:64–67. [PubMed: 3042746]
 27. Howard G, Prineas R, Moy C, Cushman M, Kellum M, Temple E, Graham A, Howard V. Racial and Geographic Differences in Awareness, Treatment, and Control of Hypertension The REasons for Geographic And Racial Differences in Stroke Study. *Stroke*. 2006; 37(5):1171–1178. [PubMed: 16556884]
 28. Maxwell, JA. *Qualitative Research Design: An Interactive Approach*. Thousand Oaks, CA: Sage Publications, Inc; 1996.
 29. Morse, J. *Qualitative Health Research*. Thousand Oaks, CA: Sage Publications, Inc; 2002.
 30. Crabtree, B.; Miller, W. *Doing Qualitative Research*. 2. Newbury Park, CA: Sage Publications, Inc; 1999.
 31. Yanow, D.; Schwartz-Shea, P. *Interpretation and method: Empirical research methods and the interpretive turn*. Armonk, New York: ME Sharpe, Inc; 2006.
 32. Wheeldon J. Mapping mixed methods research: Methods, measures, and meaning. *Journal of Mixed Methods Research*. 2010; 4:87–102.
 33. Howard G, Lackland DT, Kleindorfer DO, Kissela BM, Moy CS, Judd SE, Safford MM, Cushman M, Glasser SP, Howard VJ. Racial differences in the impact of elevated systolic blood pressure on stroke risk. *JAMA internal medicine*. 2013; 173(1):46–51. [PubMed: 23229778]
 34. Engel GL. The clinical application of the biopsychosocial model. *Am J Psychiatry*. 1980; 137:535–544. [PubMed: 7369396]
 35. Adler RH. Engel's biopsychosocial model is still relevant today. *Journal of Psychosomatic Research*. 2009; 67:607–611. [PubMed: 19913665]
 36. Ambar K, Vaccarino V, Judd SE, Howard VJ, McClellan WM, Muntner P, Hong Y, Safford MM, Goya AI, Cushman M. Life's Simple 7 and risk of incident stroke: The Reasons for Geographic and Racial Differences in Stroke Study. *Stroke*. 2013; 44:1909–1914. [PubMed: 23743971]
 37. Pratt CA, Ha L, Levine SR, Pratt CB. Stroke knowledge and barriers to stroke prevention among African Americans: implications for health communication. *Journal of Health Communication*. 2003; 8:369–81. [PubMed: 12907401]
 38. Winham DM, Jones KM. Knowledge of young African American adults about heart disease: a cross-sectional survey. *BMC Public Health*. 2011; 11:248. [PubMed: 21504588]
 39. U.S. Department of Agriculture. ChooseMyPlate.gov Website. Washington, DC: Getting Started with MyPlate; <http://chooseMyPlate.gov> [Accessed [December 2014]]
 40. Glasser SP, Judd S, Basile J, Lackland D, Halanych J, Cushman M, Prineas R, Howard V, Howard G. Prehypertension, racial prevalence and its association with risk factors: Analysis of the REasons for Geographic And Racial Differences in Stroke (REGARDS) study. *American journal of hypertension*. 2011; 24(2):194–199. [PubMed: 20864944]
 41. Ferraro KF, Shippee TP. Aging and cumulative inequality: how does inequality get under the skin? *The Gerontologist*. 2009; 49:333–43. [PubMed: 19377044]
 42. Link BG, Phelan J. Social conditions as fundamental causes of disease. *Journal of Health and Social Behavior*. 1995; (Spec No):80–94. [PubMed: 7560851]
 43. Bravata DM, Ho S, Meehan TP, Brass LM. Readmission and Death After Hospitalization for Acute Ischemic Stroke 5-Year Follow-Up in the Medicare Population. *Stroke*. 2007; 38:1899–904. [PubMed: 17510453]

44. Brown AF, Liang LJ, Vassar SD, Merkin SS, Longstreth WT, Ovbiagele B, Yan T, Escarce JJ. Neighborhood socioeconomic disadvantage and mortality after stroke. *Neurology*. 2013; 80:520–7. [PubMed: 23284071]
45. Kapral MK, Wang H, Mamdani M, Tu JV, Boden-Albala B, Sacco RL. Effect of Socioeconomic Status on Treatment and Mortality After Stroke * Editorial Comment. *Stroke*. 2002; 33:268–275. [PubMed: 11779921]
46. Levine DA, Neidecker MV, Kiefe CI, Karve S, Williams LS, Allison JJ. Racial/ethnic disparities in access to physician care and medications among US stroke survivors. *Neurology*. 2011; 76:53–61. [PubMed: 21084692]
47. Dannefer D. Cumulative Advantage/Disadvantage and the Life Course: Cross-Fertilizing Age and Social Science Theory. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*. 2003; 58:S327–S337.
48. Mirowsky J, Ross CE. Education and Self-Rated Health: Cumulative Advantage and Its Rising Importance. *Research on Aging*. 2008; 30:93–122.
49. Pampel FC, Rogers RG. Socioeconomic Status, Smoking, and Health: A Test of Competing Theories of Cumulative Advantage. *Journal of Health and Social Behavior*. 2004; 45:306–321. [PubMed: 15595509]
50. Willson AE, Shuey KM, Elder GH Jr. Cumulative Advantage Processes as Mechanisms of Inequality in Life Course Health. *American Journal of Sociology*. 2007; 112:1886–1924.
51. Hart CL, Hole DJ, Smith GD. Influence of Socioeconomic Circumstances in Early and Later Life on Stroke Risk Among Men in a Scottish Cohort Study. *Stroke*. 2000; 31:2093–2097. [PubMed: 10978035]
52. Glymour MM, Avendaño M, Haas S, Berkman LF. Lifecourse social conditions and racial disparities in incidence of first stroke. *Annals of epidemiology*. 2008; 18(12):904–912. [PubMed: 19041589]
53. Fiscella K. Health care reform and equity: promise, pitfalls, and prescriptions. *The Annals of Family Medicine*. 2011; 9:78–84. [PubMed: 21242565]
54. Gardois P, Booth A, Goyder E, Ryan T. Health promotion interventions for increasing stroke awareness in ethnic minorities: a systematic review of the literature. *BMC public health*. 2014; 14:409. [PubMed: 24775404]
55. Shlay JC, Barber B, Mickiewicz T, Maravi M, Drisko J, Estacio R, Gutierrez G, Urbina C. Peer Reviewed: Reducing Cardiovascular Disease Risk Using Patient Navigators, Denver, Colorado, 2007–2009. *Preventing Chronic Disease*. 2011; 8:A143. [PubMed: 22005636]
56. Horowitz CR, Lawlor EF. Community approaches to addressing health disparities. Report for the Institute of Medicine. 2008
57. Ogedegbe G, Tobin JN, Fernandez S, Gerin W, Diaz-Gloster M, Cassells A, Khalida C, Pickering T, Schoenthaler A, Ravenell J. Counseling African Americans to Control Hypertension (CAATCH) Trial A Multi-Level Intervention to Improve Blood Pressure Control in Hypertensive Blacks. *Circulation: Cardiovascular Quality and Outcomes*. 2009; 2:249–256. [PubMed: 20031845]
58. Thomas KL, Shah BR, Elliot-Bynum S, Thomas KD, Damon K, Allen LaPointe NM, Calhoun S, Thomas L, Breathett K, Matthews R, Anderson M, Califf RM, Peterson ED. Check It, Change It A Community-Based, Multifaceted Intervention to Improve Blood Pressure Control. *Circulation: Cardiovascular Quality and Outcomes*. 2014; 7:828–834. [PubMed: 25351480]
59. Dodani S, Arora S, Lynch S, Mahin C. HEALS: A Hypertension Control Program for African Americans: Focus Groups. *Health Behavior and Policy Review*. 2014; 1:103–110.
60. Odedosu T, Schoenthaler A, Vieira DL, Agyemang C, Ogedegbe G. Overcoming barriers to hypertension control in African Americans. *Cleveland Clinic Journal of Medicine*. 2012; 79:46. [PubMed: 22219234]
61. Wells KB, Staunton A, Norris KC, Bluthenthal R, Chung B, Gelberg L, Jones L, Kataoka S, Koegel P, Miranda J, Mangione CM, Patel K, Rodrigues M, Shapiro M, Wong M. Building an academic-community partnered network for clinical services research: the Community Health Improvement Collaborative (CHIC). *Ethnicity and Disease*. 2006; 16(1 Supp 1):S2–17.

62. Cebul RD, Love TE, Jain AK, Hebert CJ. Electronic health records and quality of diabetes care. *New England Journal of Medicine*. 2011; 365(9):825–833. [PubMed: 21879900]
63. Taplin SH, Haggstrom D, Jacobs T, Determan A, Granger J, Montalvo W, Snyder WM, Lockhart S, Calvo A. Implementing colorectal cancer screening in community health centers: addressing cancer health disparities through a regional cancer collaborative. *Medical care*. 2008; 46(9):S74–S83. [PubMed: 18725837]
64. Chin MH, Cook S, Drum ML, Jin L, Guillen M, Humikowski CA, Koopert J, Harrison JF, Lippold S, Schaefer CT. Improving diabetes care in midwest community health centers with the health disparities collaborative. *Diabetes Care*. 2004; 27(1):2–8. [PubMed: 14693957]
65. Chin MH. Quality improvement implementation and disparities: the case of the health disparities collaboratives. *Medical care*. 2010; 48(8):668. [PubMed: 20613665]
66. Chin MH, Drum ML, Guillen M, Rimington A, Levie JR, Kirchhoff AC, Quinn MT, Schaefer CT. Improving and sustaining diabetes care in community health centers with the health disparities collaboratives. *Medical care*. 2007; 45(12):1135–1143. [PubMed: 18007163]

Table 1

Psychological and Social Constraints on Risk Factor Reduction

Recommendation and odds of continued risk* (INTERSTROKE)	Psychological and Social Constraints (TEAM Study)	Example
A. Control hypertension with medication (OR=2.6) & B. Control Lipids with medication (OR=1.9)	<ul style="list-style-type: none"> Poor access to care prevents effective use of medication and health services Non-adherence due to mistrust or negative attitudes Tailoring of medication (skipping doses, bargaining) Racial discrimination and a lifetime of distress can make hypertension more difficult to treat Expensive medication 	<p><i>Man their scheduling... I'm almost at the end of my medication. I'm like oh God I need a refill. Participant P1</i></p> <p><i>"Sometimes I think of the doctors as just using us as a paycheck. If you get sick who you gonna go see, your doctor, who gets paid, your doctor. If they write a prescription for you they get kickbacks."</i></p> <p><i>Participant P2</i></p>
C. Salt restriction & Consumption of a diet rich in fruits, vegetables, and low-fat dairy products (OR=1.4)	<ul style="list-style-type: none"> Cultural traditions including high salt/high fat foods Difficulty/costs in obtaining low salt/low fat foods Pressure from family and friends to eat "traditional" foods Knowledge and literacy barriers to reading labels and selecting healthy foods. 	<p><i>"I grew up on soul food all my life and it's kind of hard for me to change."</i></p> <p><i>Respondent P5</i></p>
D. Regular aerobic physical activity (OR=1.4)	<ul style="list-style-type: none"> Inadequate access to safe and affordable exercise programs/facilities Competing demands (stroke survivors are often themselves caregivers for spouses, children, older parents or siblings) 	<p><i>"I have a hard time walking... Because a house is not big enough to just get up and walk around any damn place you want. I mean you can do that, but where are you going to go?" Respondent P3</i></p>
E. Limit alcohol consumption (OR=1.5) & F. Quit Smoking (OR=2.1)	<ul style="list-style-type: none"> Family, peer and social network pressures to continue past behaviors Poor mood, negative affect and psychosocial stress may contribute to increased smoking and /or alcohol use 	<p><i>The things that get in the way of staying healthy and preventing another stroke? Okay. We put drinking alcohol."</i></p> <p><i>Resp. P9</i></p>
G. Weight loss (OR=1.7)	<ul style="list-style-type: none"> Inadequate access to safe and affordable exercise programs/facilities Depression and psychosocial stress can make weight loss difficult Mobility limitations make exercise difficult Lack of access to healthy foods 	<p><i>"My left side is pretty much paralyzed, so I have a hard time getting around or using the whole left side of my body."</i></p> <p><i>Respondent P4.</i></p>
H. Control depression (OR=1.4) and I. Psychosocial stress (OR=1.3)	<ul style="list-style-type: none"> Current and historical discrimination against African American Men Stigma of mental illness Depression symptoms may be "normalized" or go unrecognized or unreported Changes in social roles after stroke may increase depression and distress Persistent financial difficulties for low socioeconomic status African Americans contribute to distress and depression. 	<p><i>"I was in a lot of stress the day before I had the stroke" Respondent P1</i></p> <p><i>"The top concern is handling stress level, and I heard it mentioned here over and over. When you're down on yourself, and you just can't get up and go."</i></p> <p><i>Respondent P2</i></p> <p><i>"I would uhm come home some nights and he would be so depressed..."</i></p> <p><i>Respondent CP3</i></p>

Recommendation and odds of continued risk* (INTERSTROKE)	Psychological and Social Constraints (TEAM Study)	Example
	<ul style="list-style-type: none">Constrained ability to reduce risks (through blood pressure, exercise, eating right etc.) can create even more distress	

Total Potential Increase in Risk, OR = 15.3.

* Odds of continued risk represent 90% of the risk of stroke²².