

# CARDIOVASCULAR DISEASE OUTCOMES: PRIORITIES TODAY, PRIORITIES TOMORROW FOR RESEARCH AND COMMUNITY HEALTH

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The disparities and differences in heart disease and stroke among Black, White and Hispanic populations tell a compelling and continuing story that should drive research agendas to improve health outcomes. With Black men and women having the highest prevalence of hypertension, Black females having higher rates of coronary heart disease, stroke and breast cancer than White females, and Blacks, at all ages, having a greater risk for stroke mortality than Whites, researchers and health care providers must understand the clinical appropriateness of treatment for different states of disease among distinct populations. Further, to eliminate health disparities, the health care systems and legal regulatory climate must facilitate access to care while biases, prejudices and stereotyping by health care providers and all those in the health care system must be eliminated. Importantly, research continues to illustrate that many are dying prematurely or have advanced stages of disease because of disparate care.

This article explores four strategies to address inequitable care and to work toward eliminating poorer health outcomes among minorities. First, those who deliver health care must adopt a quality-focused approach that improves the care of all patients while facilitating the reduction and elimination of health disparities. Second, cultural awareness and cultural competency must be improved. Third, we must remove barriers to access and promote public policies that lead to greater health awareness and healthier environments. Lastly, but most importantly, we need a prevention focus as the reduction in the onset of disease is the first step towards improving health outcomes. (*Ethn Dis.* 2012; 22[Suppl 1]:S1-7–S1-12)

“Of all forms of inequality, injustice in health care is the most shocking and inhumane.”

—Dr. Martin Luther King, Jr., 1966

## INTRODUCTION

As pertinent today as they were in 1966, the words of Dr. Martin Luther King, Jr. set a framework from which our research agenda should be built to include equality in health access, delivery and patient outcomes as central elements of any forward moving strategy. From this framework, priorities can be established to focus

on approaches and programming that will work toward improved cardiovascular disease outcomes.

As a primary step, researchers and health professionals should recognize the changing demographic of the United States. Today, one in three of all Americans are minorities; by 2020, four in 10 Americans will be minorities; and, by 2050, projections indicate that there will no longer be a majority ethnicity or race in this country, with Whites comprising only 46% of the population.<sup>1</sup> Since we expect a number of pluralities to be the norm in 2050, it becomes even more important to be sensitive to the needs for all Americans, if we expect to succeed in our roles as health care providers.

## HEART DISEASE AND STROKE STATISTICS – 2010 UPDATE

The most recent evidence tells a compelling story about the disparities and differences in heart disease and stroke among Black, White and Hispanic populations. According to the latest data from the CDC and the National Center for Health Statistics, Black females outpaced White females for rates of coronary heart disease, stroke and breast cancer.<sup>2</sup> (Figure 1). Likewise, Blacks, at all ages, have a greater risk for stroke mortality when compared with Whites and other ethnic groups<sup>3</sup> (Figure 2). And, just as dramatically, non-Hispanic African American men and women have the highest prevalence for hypertension and have had such for several decades (Figure 3).<sup>4</sup>

In its 2003 report, the Institute of Medicine defined health disparities as racial or ethnic differences in health care that are not due to access-related factors, clinical needs, patient preferences or the appropriateness of the intervention.<sup>5</sup> The authors further allowed for equal access to care and based on metrics that identified quality of care noted residual differences in health that remained as a function of race and ethnicity. Some of these differences are readily explained by disease severity and patient preference but what persists reflects a non-physiological contribution to different health outcomes. That residual difference is evidence of disparate care and is attributable to a number of provider-, system- and patient-level factors. To better understand disparities in health care we should begin investigating causative issues within the ecology of care.

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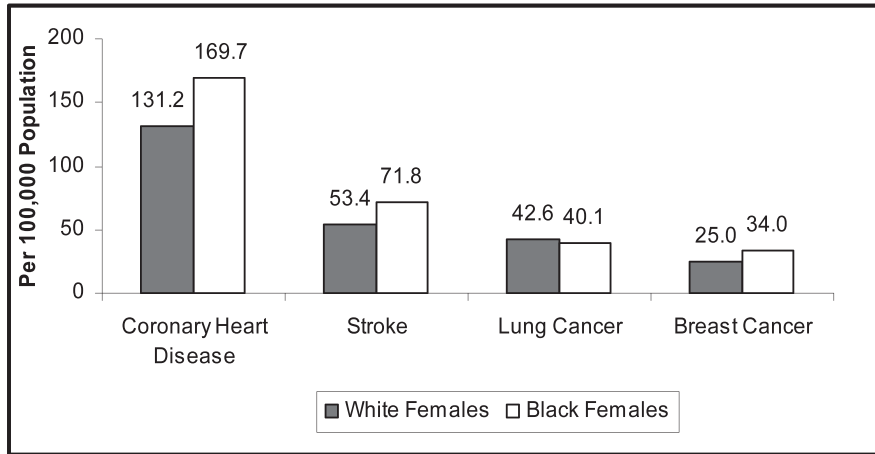


Fig 1. Age-adjusted death rates for coronary heart disease, stroke, and lung and breast cancer for White and Black females, United States, 2002<sup>2</sup>

Some of the most disturbing examples of health disparities include: 1) minorities (Blacks and Hispanics) are up to three times more likely than Whites to be operated on by surgeons in the bottom-quality performance group<sup>6</sup>; more than 50% of Hispanic elderly are cared for by only 5% of US hospitals<sup>7</sup>; some American Indian tribes have more than 50% occurrence of type 2 diabetes<sup>8</sup>; low-income families are six times less likely to receive care for a health problem<sup>9,10</sup>; and death rate from heart disease was 40% higher for poor men than for wealthier ones.<sup>11</sup> It can be said that the stain of disparate health care is pervasive and clearly is present in heart disease and stroke. Based on the number of individuals at risk, our health systems and providers must aim to improve the health of all persons by renewing a commitment in medicine to provide best care to all and to do so equitably and compassionately.

### UNDERSTANDING THE PATHOPHYSIOLOGY OF HEALTH DISPARITIES

From the IOM report<sup>5</sup> mentioned previously, two major points have been central in our understanding of disparate health care and should drive efforts to address these disparities. First, racial and ethnic disparities in health care do exist and are associated with worse outcomes. Second, bias, stereotyping, prejudice and clinical uncertainty on the part of the health care system may contribute to racial/ethnic disparities in health care. These latter issues are troublesome to acknowledge and likely exist at a subconscious level but the influence on the health care delivery process can be overt, specifically at the level of the health system. For example, within a health system, issues related to cultural insensitivities, such as financing, access to care, and cultural and linguistic barriers represent true impediments to receiving optimal care.

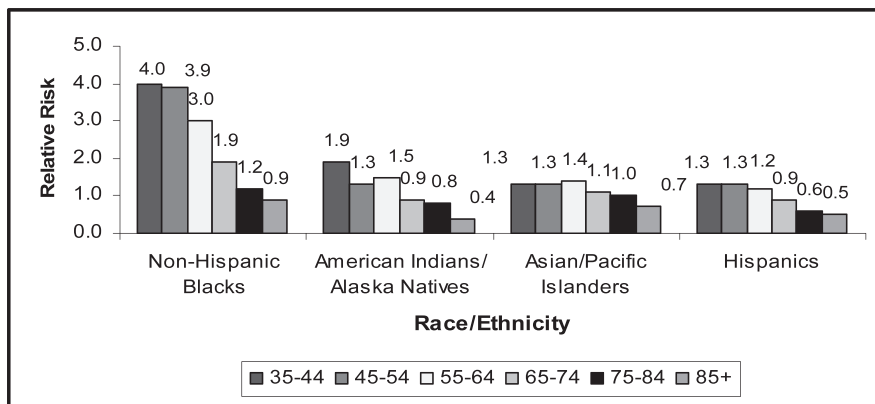


Fig 2. Risk for stroke mortality among racial/ethnic groups compared with non-Hispanic Whites, by age, United States, 1997<sup>3</sup>  
 Note: values >1.0 indicate populations with higher relative risks. Values <1.0 indicate lower relative risks<sup>3</sup>

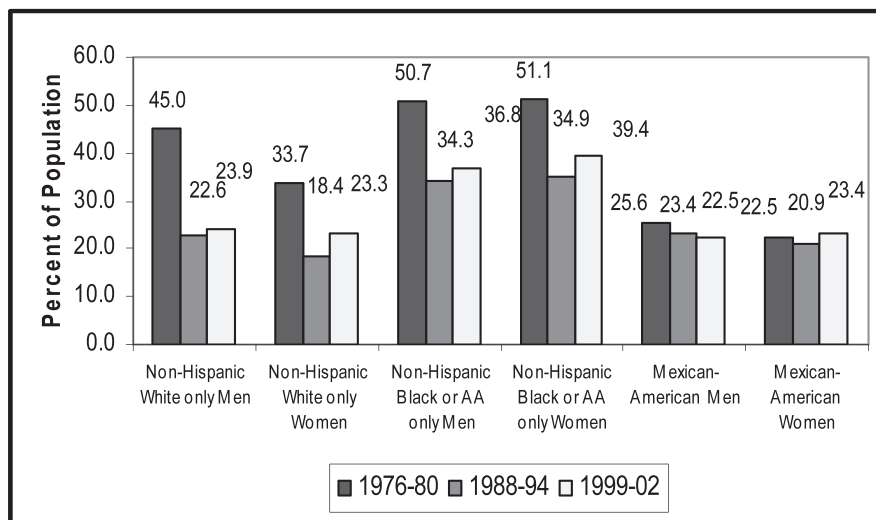


Fig 3. Age-adjusted prevalence trends for high blood pressure in Americans, aged 20-74 years, by race/ethnicity, sex. NHANES: 1976-80; 1988-94; 1999-2002<sup>4</sup>

In reviewing the patient-provider encounter, it becomes clear that a linear pathway between objective data interpretation and clinical decision-making may stray. In the absence of cultural competency awareness/training, physicians may overlay a subjective interpretation of the data, driven by social, economic, cultural, stereotypical and prejudicial influences. In turn, the subjective interpretation now colors what intervention is selected for the patient. Ultimately, it is the intervention that determines the quality of the health care outcomes and if it is influenced unduly by a subjective lens, then racially/ethnically disparate clinical decision-making may ensue.

At the patient level, there are factors of poor adherence and biological differences. The sum total of the health system, provider and patient level issues drive disparate care.

Yet, how is it that well-meaning and highly educated health professionals in highly regarded health care systems, working in their usual circumstances with diverse populations of patients, may have created a pattern of care that appears to be discriminatory? This brings the discussion to conceptualizing the impact of stereotyping, the process by which people use social categories (eg, race, sex, socioeconomic status) to acquire, process and recall information about others. Stereotypical beliefs may serve a useful function when they allow individuals to organize and simplify complex situations and provide greater confidence in the ability to understand, predict and potentially control situations and people. Unfortunately, not all stereotypical beliefs foster a positive outcome. Take, for example entries on stereotypes for African Americans and Hispanics found on the commonly used social media site, Wikipedia.<sup>12</sup> African Americans: “animalistic brutes,” “criminal minded,” “violent.”

African American women: “grossly overweight,” “gaudy attire,” “spiritual to the point of delusion”; African American men: “intellectually, economically and culturally inadequate,” “soliciting or in constant need of assistance from White Americans;” Hispanics: “over-representation as criminals on national media”; Hispanic men: “incestuous megalomaniacs, lazy and illegal”; and Hispanic women: “easy,” “dirty.”<sup>13</sup> These are sentiments that shape negative stereotypes and influence subconscious thought.

Physicians are not immune to these types of stereotypes and at a subconscious level some of these stereotypes may change the prism through which physicians process information and manage the patient encounter. The risks associated with stereotyping include: 1) the effects on thinking and actions at an implicit, unconscious level, even among well-meaning, well-educated persons who are not overtly biased; 2) an influence on how information is processed; and 3) exerting self-fulfilling effects, as interpretation of patients’ behaviors may be affected by providers’ overt or subtle attitudes and beliefs.

## UNDERSTANDING CARDIOVASCULAR HEALTH OUTCOMES

In cardiovascular medicine, the evidence of disparate care is ubiquitous and notably so in the progression of heart failure. The assessment of different outcomes is complicated however by potentially important physiological differences. For example, in the African American heart Failure Trial (A-HeFT),<sup>14</sup> Taylor, Zeische, Yancy and colleagues randomized African Americans with heart failure to standard therapy vs standard

therapy plus the addition of a combination vasodilating drug (isosorbide dinitrate and hydralazine), thought to have unique responsiveness in African Americans. The regimen of standard heart failure therapy, including neurohormonal blockers, with the added combination drug was efficacious and increased survival among Black patients with advanced heart failure.<sup>12</sup> The study demonstrated that a unique cohort of individuals with a very important and distinct disease process could, in fact, respond differently to a medical intervention.

While the science behind this reaction is still somewhat speculative, Hare has posited a mechanism that is associated with the imbalance of nitric oxide and reactive oxygen species [ROS], ie, oxidative stress, in certain heart failure patients.<sup>15</sup> It is noted that in the presence of certain co-factors, nitric oxide (NO) is generated by nitric oxide synthase. Among other functions, NO keeps blood vessels compliant. A small amount of super oxide, a reactive oxygen species, is obligatory in this metabolic pathway; however, when co-factors are depleted, there is a shift away from NO synthesis towards excess reactive oxygen species production. The consequences are thickening and inelasticity in blood vessels while damaging certain sub-cellular compartments. Though this was not felt to be the targeted mechanism of action in A-HeFT, it has emerged as a reasonable hypothesis underpinning the unique benefit of isosorbide dinitrate given in combination with hydralazine. The nitrate moiety appears to have contributed to increased NO production while the hydralazine component functioned as an anti-oxidant and attenuated the deleterious effects of excess ROS. Subsequently, in a pre-specified substudy of A-HeFT,<sup>16</sup> McNamara et al identified a candidate single nucleotide polymorphism of the endothelial nitric oxide synthase (NOS3) gene responsible for the production of nitric oxide that may be over-represented in African Americans. For patients without this candidate NOS3 polymorphism (-786 T/C promoter, intron 4a/4b, and Glu298Asp), the effect of treatment with fixed-dose combination of isosorbide dinitrates and hydralazine was little to none. Those with the polymorphism who were not given the combination therapy did poorly or died. On the other hand, those with the candidate polymorphism and given the combination therapy did significantly better than those in either of the other two groups.<sup>14</sup> These findings are provocative but must be interpreted with caution as the data remain preliminary. Nevertheless, such findings set the stage to go beyond race-based therapies and to enter the realm of true personalized medicine. These findings are not limited to African Americans and reveal the potential for others to benefit from this approach. Thus, in studying African American responses, research has revealed new mechanisms of disease.

Other studies report disparate findings in heart failure in African Americans compared to Whites. Using data from the CARDIA study, Bibbins-Domingo and colleagues reported on heart failure incidence among 5,115 young adults. They found that,

over the course of a 20-year period, 27 participants, most of whom had access to care, developed heart failure; all but one were Black.<sup>17</sup> We argued in an accompanying editorial that there is growing and disturbing evidence that disparities in care result in preventable excess morbidity and possibly increased mortality.<sup>18</sup>

### CHARTING A NEW COURSE: TOMORROW'S PRIORITIES

As research continues to illustrate, many are dying prematurely or have advanced stages of disease because of disparate care. What new directions can we follow to correct this course of poorer health outcomes among minorities? First, those who deliver health care must adopt a quality-focused approach that improves the care of all patients while facilitating the reduction and elimination of health disparities. Second, cultural awareness and cultural competency must be improved. Third, we must remove barriers to access and promote public policies that lead to greater health awareness and healthier environments. Lastly, but most importantly, we need a prevention focus as the reduction in the onset of disease is the first step towards improving health outcomes.

#### *Adopting High-quality, Focused Approaches*

To date, several groups have initiated quality-focused strategies. Robert Wood Johnson has launched *Expecting Success*, a multicenter quality improvement program targeting acute myocardial infarction and heart failure. The American College of Cardiology has developed CREDO, a coalition to reduce disparate health care and, the American Heart Association has established a performance improvement program, *Get with the Guidelines*, for heart failure, coronary disease and stroke.

These programs are already making a difference. For hospitals participating in the *Get with the Guidelines-Coronary Artery Disease* program, not only was the use of the performance improvement program associated with improvement in evidence-based care for acute myocardial infarction over time irrespective of race / ethnicity, but also differences in care by race / ethnicity were *reduced or eliminated*.<sup>19</sup>

#### *Improving Cultural Competency*

The goal of cultural competence is to create a health care system and workforce that are capable of delivering the highest quality of care to every patient, regardless of race, ethnicity, or other cultural variation. According to the NIH Office of Minority Health, "because health care is a cultural construct, arising from beliefs about the nature of disease and the human body, cultural issues are actually central in the delivery of health services treatment and preventive interventions." [Garth Graham, director, personal communication, 2009] Cultural barriers to achieving ideal health include: a belief that prevention is not a concern, language barriers, a distrust of Western medicine,

immigration concerns, a lack of understanding of the medical system, and being uninsured. One effort currently underway to address these barriers is American Heart Association's cultural competency initiative focused on improving provider and patient cultural awareness and a companion effort focused more globally on achieving health equity.

### *Improving Health Equity*

Health equity can only be achieved when barriers (eg, cultural competency, health care access, etc) are overcome and when health care providers, researchers and patients understand the anatomy of disparate care and take definitive steps to make health care equitable. In 2010, the American Heart Association initiated the first-ever Health Equity Summit with the goal of no longer identifying disparities but seeking solutions to eliminate this problem. As a result, the Summit participants identified three pillars of achieving health equity: 1) assure cultural competence; 2) eliminate health disparities; and 3) targeted minority initiatives.

Research is helping to identify strategies to achieve health equity through advocacy and health care policy initiatives. For example, Bibbins-Domingo<sup>20</sup> recently developed a computerized model that demonstrates what would happen if sodium consumption was reduced by 1 to 3 grams per day. For African Americans a reduction in salt consumption by 3 grams/day would lead to a decrease of 9 mm Hg for systolic blood pressure; this is equivalent to what one would expect to achieve if using standard pharmacological interventions (eg, diuretics, ACE-inhibitors or calcium channel blockers). The models also projected that reducing dietary salt by 3 grams/day would reduce the annual number of new cases of coronary heart disease by 60,000 to 120,000, stroke by 32,000–66,000 and myocardial infarction by 54,000–99,000 and that Blacks would benefit more than other segments of the population. Thus, while biology, genetics and identifying cohorts with unique responses are important mechanisms for reducing health disparities, there may be an equally, if not greater, gain to be had by a public policy approach that looks at the ecology of health. In this case, changing food policy and reducing salt consumption would achieve improved health outcomes that may support a greater health equity.

### *Preventing Heart Disease and Stroke*

In 2010, the American Heart Association (AHA) also unveiled metrics and other key details of a new strategic impact goal through 2020 and beyond. In a shift of focus, the roadmap guides AHA efforts in discovering, adapting and disseminating scientific knowledge to sustain cardiovascular health promotion and disease reduction. Supporting this focus is the recent research by Lloyd-Jones demonstrating that, if by aged 50 years, an individual is free of any adverse risk factors or health factors, the likelihood of living into the 90s and beyond is very high (95%

chance for men and 92% chance for women).<sup>21</sup> This research suggests an ideal health profile can be achieved. Using this concept, the AHA built strategies to achieve ideal health built on these health measures, known as *Life's Simple Seven*: 1) never smoke; 2) body mass index <25 kg/m<sup>2</sup>; 3) physical activity of at least 150 minutes (moderate intensity) or 75 minutes (vigorous intensity) each week; 4) four to five key components of a healthy diet consistent with current AHA guidelines; 5) total cholesterol of <200 mg/dL; 6) blood pressure below 120/80 mm Hg; 7) fasting blood glucose <100 mg/dL. The power here is in the package. When all of these seven metrics are met, regardless of race or ethnicity, the impact on health and quality of life is profound.

## CONCLUSION

In today's world, we have a damaged health care infrastructure, we have food deserts, grocery stores that don't have fresh food items, and conversely, we have food swamps, a veritable parade of fast food choices. We have poor health care access for many people and we have overcrowded and underperforming community clinics. All of these factors add up to significant, and very often, inequitable health outcomes.

But, in tomorrow's world, we look toward children who will never know what high blood pressure is; toward individuals who will always understand health information and have culturally competent exchanges with their health care providers; toward individuals who will respect what it is to have a normal body weight and will adopt a dietary and fitness lifestyle to achieve ideal weight; toward individuals who will disdain smoking from birth; and toward individuals who will always be able to access medical care and all that is needed to improve health, regardless of circumstances. This new world should not be our utopia but our expectation.

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