

EDITORIAL

Data in a Vacuum? The Desperate Need for a Paradigm Shift to Prevent Heart Failure in Black Americans

Alexis Okoh, MD; Alanna A. Morris , MD, MSc

By 2030, projections suggest that >8 million adults in the United States will have heart failure (HF).¹ Given the enormous morbidity, mortality, and cost associated with this condition, strategies to prevent HF will have the most public health impact. The potential for prevention may be particularly impactful for Black Americans, who experience a disproportionate burden of HF, characterized by a younger age at disease onset and a higher burden of hospitalization and death, compared with other race-ethnic groups.^{2–4} The burden of HF in the Black community is largely driven by the high prevalence of cardiovascular disease (CVD) risk factors, including hypertension, diabetes mellitus, and obesity. However, recent sex- and race-specific estimates of the 10-year risk of HF from community-based cohorts demonstrate a greater risk of HF for Black men and women compared with White individuals, regardless of whether the risk factor profile is optimal, intermediate, or high risk.⁵ Other factors that play a significant role include subclinical left ventricular abnormalities and social determinants of health, although these can be difficult to quantify and integrate into risk prediction tools.^{4,6}

With the introduction of its HF staging system in 2004, the American College of Cardiology (ACC) and the American Heart Association (AHA) intended to place greater emphasis on prevention of HF, by prioritizing the identification of asymptomatic patients with clinical risk

factors for HF without (stage A) or with (stage B) evidence of cardiac structural abnormalities, in addition to those with symptomatic HF (stage C or D).⁷ The prevalence of stage B HF can be difficult to ascertain epidemiologically, because imaging studies or biomarkers are usually obtained to diagnose HF, rather than to prevent HF. In this issue of the *Journal of the American Heart Association (JAHA)*, Vasan et al estimate the prevalence and prognosis of the American College of Cardiology and the American Heart Association HF stages in 1871 middle-aged Black participants who underwent routine echocardiography in the Jackson, Mississippi site of the ARIC (Atherosclerosis Risk in Communities) Study.⁸ The authors hypothesized that, for middle-aged Black individuals, the prevalence of stage B HF would be high, and be associated with an increased risk of incident HF as well as non-HF-related CVD morbidity and mortality.

See Article by Vasan et al.

There are several notable findings from this analysis: (1) Relatively few (3.8%) middle-aged Black individuals in the ARIC Study cohort were healthy (stage 0) at the visit 3 examination; however, few cardiovascular events were observed during follow-up in those participants who were risk factor free. (2) A total of 20% of participants had stage A HF, 67% had stage B HF, and 8.6% had stage C/D HF. Over 19 years of follow-up, overt HF occurred in 16.5% of the population, CVD occurred

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Correspondence to: Alanna A. Morris, MD, MSc, 1462 Clifton Rd, Suite 504, Atlanta, GA 30322. E-mail: aamorr3@emory.edu

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in 20.8%, and all-cause mortality occurred in 34.7%, including 11.1% who died due to cardiac causes. Absolute event rates increased across the HF stages. (3) The prevalence of stage C/D HF was twice as high in Black women compared with Black men, with HF with preserved ejection fraction being the predominant (89%) HF phenotype.

In this critical study, the authors have reminded us of the importance of early diagnosis and prevention of symptomatic HF in middle-aged Black individuals. Their findings can be reflected in an inverted pyramid, a sharp divergence from how the prevalence of HF stages in the general population appears. During visit 3 of this longitudinal study, the prevalence of stage 0 HF in Black individuals was surprisingly low, at 3.8%, compared with an alarming two thirds of patients in stage B. These findings are in stark contrast with similar analyses that assessed the prevalence of various HF stages in an overwhelmingly White population in Olmsted County, Minnesota, and demonstrated that 32% were stage 0, 22% were stage A, 34% were stage B, and 12.2% were stage C/D,⁹ or a recent analysis of the CARDIA (Coronary Artery Risk Development in Young Adults) study cohort that demonstrated 40% of White individuals were stage 0, 36% were stage A, 23.5% were stage B, and <1% were stage C/D (Figure).¹⁰ Similar to the Jackson participants in the ARIC cohort, absolute cardiovascular event rates increased with each HF stage in these cohorts.

Numerous epidemiological studies have reported an elevated incidence of left ventricular hypertrophy (LVH) in Black individuals, even after adjusting for the presence of other traditional cardiovascular risk factors. In the current study by Vasani et al, an astonishing 98% of the participants classified as having stage B HF had evidence of LVH at the Year 3 exam, which was a risk factor for developing HF or CVD at follow-up. The analysis of the year 30 examinations in the CARDIA study showed greater left ventricular mass index and LVH in Black men and women compared with their White counterparts.¹⁰ A recent comparison of 5727 Black and White participants in the ARIC Study cohort demonstrated higher arterial afterload and decreased arterial compliance in Black individuals relative to White individuals.¹¹ Furthermore, Black participants displayed heightened myocardial afterload sensitivity. Increases in arterial afterload were associated with more significant increases in left ventricular mass, volumes, and worse diastolic function in Black individuals than White individuals, which was related to higher proportions of African genomic ancestry. Subclinical LVH in Black individuals plays a significant role in the progression to symptomatic HF. Indeed, malignant LVH (eg, LVH associated with elevated cardiac troponin and NT-proBNP [N-terminal pro-B-type natriuretic peptide]) contributes to racial disparities in HF incidence, primarily because of the higher prevalence of malignant LVH in Black individuals.⁶ For Black individuals, there is a dire need for a better

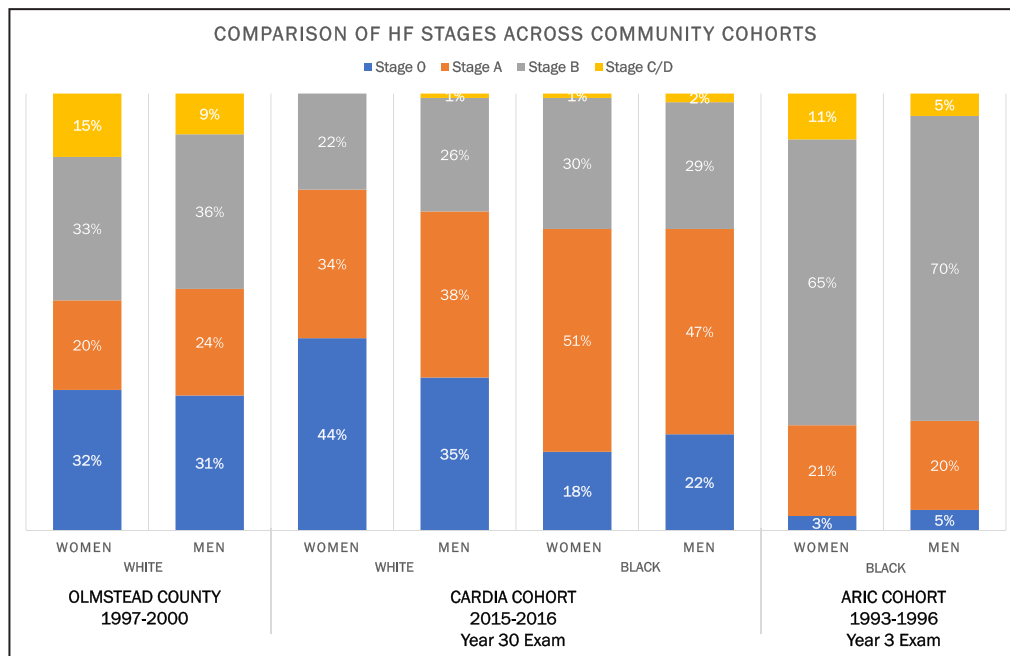


Figure. Comparison of heart failure (HF) stages across 3 community cohorts.

Prevalence of HF stages in Olmsted County, Minnesota, from Ammar et al,⁹ CARDIA (Coronary Artery Risk Development in Young Adults) study from Gidding et al,¹⁰ and Black participants in ARIC (Atherosclerosis Risk in Communities) Study in Jackson, MS, from Vasani et al.⁸ Exam indicates examination.

understanding of not only hypertension and associated vascular abnormalities, but also of the mechanisms underlying abnormal ventricular-vascular coupling.

Finally, it is not without relevance that the prevalence of the ACC/AHA HF stages is extraordinarily high in Black individuals in midlife in the state of Mississippi. Rather than reviewing the epidemiological characteristics in a vacuum, it is important to ground these data in appropriate context. To this day, Mississippi has the most Black Americans of any state in the United States, because Mississippi had the largest concentration of enslaved Black people of any state in the United States in 1860. The adverse consequences of slavery on health can still be documented in modern-day times. A recent analysis by Kramer et al explored the distribution of slavery in 1860, and the relative decline in CVD mortality in Southern states from 1968 to 2014.¹² Black individuals living in counties that previously had the highest concentrations of enslaved people in 1860 experienced only a 17% decline in cardiovascular mortality from 1968 to 2014,¹² much lower than the average 62% reduction in CVD mortality rates across other parts of the United States.¹³ The authors noted that “this association [was] particularly evident in the Deep South states of Mississippi, Alabama, and Louisiana.” The slower decline in CVD mortality for Black individuals was, in part, explained by intervening socioeconomic and inequality-generating processes, such as Black-White disparities in educational and economic opportunity, incidence of lynchings, and other factors, underscoring the importance of social determinants of health as a driver of the modern-day poor health of Black Americans. Even for those with high educational attainment, the lived experience of being a Black individual can in and of itself be hazardous to one’s health. A recent analysis of the JHS (Jackson Heart Study) documented the association between the experience of lifetime discrimination and incident hypertension.¹⁴ Roughly 67% of participants reported medium to high levels of everyday discrimination, whereas 88% reported medium to high levels of lifetime discrimination despite ~57% being of upper-middle income or affluent socioeconomic status. Higher reported stress from lifetime discrimination was associated with a higher risk of incident hypertension. Participants with more stress from lifetime discrimination were more likely to engage in unhealthy behaviors. However, adjustment for those behaviors (tobacco and alcohol use, poor diet, and physical inactivity) attenuated the association between stress and hypertension, suggesting an opportunity for intervention at 2 levels: eliminating discrimination from the lived experience of Black Americans, and providing more healthy opportunities to cope with the stressors related to this lived experience.

Prevention of CVD and resultant improvements in population health can only be achieved through

policies that ensure equitable access to opportunities for healthy lifestyle as well as high-quality, affordable health care for all Americans, including evidence-based preventive services.¹⁵ Clinicians often begin by emphasizing management of individual risk factors to promote optimal cardiovascular health, especially hypertension, tobacco use, obesity, and physical inactivity. However, recent guidelines on primary prevention of CVD also encourage clinicians “to evaluate the social determinants of health that affect individuals,”¹⁶ as current risk prediction equations for CVD rarely capture the social determinants that put some patients at higher risk. For example, long-standing and persistent racial segregation of neighborhoods has resulted in decreased access for Black Americans to resources that promote overall health and primary prevention of CVD, including adequate schools, exercise facilities, and grocery stores. Despite recent data showing that states that expanded Medicaid under the Affordable Care Act have had fewer deaths from cardiovascular causes than nonexpansion states, 8 of the 12 states that have currently opted not to expand Medicaid are in the Deep South.^{17,18} Moreover, 97% of the 2 million uninsured adults who fall into the “coverage gap” live in the South.¹⁸ The 2010 Census revealed that 55% of Black individuals in the United States still live in the South. Medicaid expansion and other public health policies that would create health equity have been stifled in parts of the country that have the most striking healthcare disparities, in part, because of the enduring legacy of racism. As such, improving the health of Black Americans will require a continued prioritization of traditional (blood pressure, cholesterol, and fasting blood glucose) and nontraditional (healthcare access, medical mistrust, food security, police violence, and racism) risk factors to achieve the stated goals of disease prevention and health equity in this vulnerable population.

So, as the old axiom goes, “an ounce of prevention is worth a pound of cure.” Screening high-risk populations, such as those with hypertension and other cardiometabolic risk factors, can be effective for preventing HF. Achieving optimal blood pressure targets is recommended for those with stages A through C HF,¹⁹ and can be particularly challenging for Black patients. The assessment of natriuretic peptide levels in stage A/B patients can prevent the onset of stage C/D HF, particularly when combined with rapid uptitration of medical therapy, and is recommended by the HF guidelines.^{19,20} However, whether the approach is aggressive in-office education about Life’s Simple 7, frequent follow-up visits to ensure patients achieve blood pressure control, or assessing natriuretic peptides or other novel biomarkers, disease prevention cannot be achieved without ensuring our entire population has access to adequate health

services. Ironically, Black Americans, who have the highest risk for incident HF as well as several other chronic conditions, are among the least likely to be able to access the healthcare system, and among the most likely to receive poor-quality care even when healthcare access is available. To truly achieve prevention of CVD, healthcare providers must embrace social policy as a component of our healthcare policy. Until we look farther than the patient in front of us, farther than the walls of our clinics, and comprehensively address the structural inequities that place an individual patient at greater peril for having the associated CVD risk factors, our data and guidelines will continue to exist in a vacuum.

ARTICLE INFORMATION

Affiliations

From the Department of Medicine, Rutgers Robert Wood Johnson Barnabas Health, Newark, NJ (A.O.); and Division of Cardiology, Emory University School of Medicine, Atlanta, GA (A.A.M.).

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