# The Impact of Coronary Artery Disease on the African American Population

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**Abstract**

**Background:** Coronary Artery Disease (CAD) is a cardiovascular disease that develops when plaque build-up occurs in the coronary arteries, narrowing or blocking blood circulation. The African American community in the United States is the most vulnerable to CAD.
**Objectives:** The purpose of this literature review is to analyze and synthesize the various factors that contribute to the susceptibility of CAD within the African American community. By recognizing these key components, an effective public health intervention can be designed and implemented into the community to minimize the effects of CAD.
**Methods:** This literature review was conducted by the use of PubMed, American Heart Association Journals, the Center for Disease Control and Prevention, and other scholarly sources relevant to the keywords.
**Results:** The African American community is the highest at risk of CAD due to biological, genetic, lifestyle interferential, cultural behavioral, and socioeconomic reasons. This includes hypertension, smoking, family history, segregation, redlining, and lack of quality healthcare in African American communities.
**Conclusions:** Due to the various Social Determinants of Health concerning African American communities, African American patients and individuals are not able to receive the equitable quality healthcare needed to care for CAD. The existence of numerous Social Determinants of Health affecting African American communities hinders their access to equitable, high-quality healthcare for CAD. Consequently, it is imperative for individuals to proactively initiate healthcare interventions that provide essential resources and education to empower the African American community.
**Keywords:** Coronary Artery Disease, African Americans, Social Determinants of Health, Prevalence and Risk Factors of Cardiovascular Diseases, Health Implications, Health Interventions

## *Introduction*

Cardiovascular disease (CVD) is the leading cause of death around the world (Mensah 2018). Coronary Artery Disease (CAD) is currently the most common CVD in the United States, with approximately 382,820 deaths annually (“Heart disease and stroke prevention”, 2022). CAD is defined by plaque buildup in the coronary arteries, narrowing blood vessels and reducing the flow of blood to the heart and body (CDC 2022). Despite various medical breakthroughs and innovations, CAD affects individuals not only in the U.S., but worldwide.

CAD has several genetic and environmental risks, affecting certain demographics more than others. Notably, the African African community is the largest at risk for CAD, facing the highest mortality rates. This community is at risk due to factors such as systemic racism, access to healthcare, lack of awareness/education, delays in recognition and treatment, and other various social determinants of health that affect their well-being (Clark et al., 2001). The rates of CAD have declined in recent decades, yet that decline is substantially smaller among African Americans compared to other demographics (Carnethon et al. 2017).

To promote health equity in the African American community, it is important to dive deeper and understand the factors that influence their diagnosis and disease progression. This literature review endeavors to examine various determinants of cardiovascular health among African Americans and emphasize the significance of implementing tailored solutions for this demographic. This information is crucial in inspiring the development of our community-focused intervention against this public health issue.

***Methods***

This literature review intended to analyze existing articles on potential connections between CAD and the African American community. Through comprehensive synthesis of scientific publications, government and research reports, case studies, and other scholarly sources, our research team investigated the background, effects, and risk factors of CAD on the African American population. Several key terms were utilized to identify literature using PubMed searches such as “Coronary Artery Disease and African Americans,” “Cardiovascular Disease and African Americans,” and “Epidemiology of Coronary Artery Disease.” Articles included met the criteria of discussing the association linking CAD and African American

population health outcomes. The literature search was performed periodically from June 20 to June 25, 2023. The chosen articles were reviewed by all authors to determine relevance.

### *Epidemiology*

CAD is currently the leading Cardiovascular Disease (CVD) for mortality worldwide (CDC, 2022). In 2020, approximately 126 million individuals, roughly 5% of the population worldwide, were diagnosed with CAD (CDC, 2023). While CAD develops across all races, sexes, and ethnic groups, the African American population is the highest at risk accounting for 22.6% of all CAD-related deaths in the U.S. in 2021, followed by Asian, Native Hawaiin, and White individuals with 18.6%, 18.3%, and 18% CAD deaths respectively (CDC, 2023). Interestingly, the prevalence of CAD increases for individuals older than 35, across both men and women (Brown et al., 2023). Research suggests that infectious heart diseases are more prevalent in peripheral countries, playing a larger role in low-income areas rather than CVDs. Most worldwide CAD cases and deaths can be attributed to chronic diseases within high-income countries, as lifestyle interventions and familial history are the major causes in these developed states (Ralapanawa & Sivakanesan, 2021).

### *Prevalence and Risk Factors*

Coronary Artery Disease (CAD) is a significant public health concern nationally, its effects predominantly impacting the African American community. Numerous studies have showcased a heavy prevalence of modifiable factors, such as hypertension, diabetes, obesity, and dyslipidemia, and non-modifiable risk factors, such as age, race, genetics, and familial history, regarding lifestyle, biology, and socioeconomic components within this population (Javed et al., 2022). These risk factors increase the vulnerability of the African American community to developing and contracting CAD.

## I. Hypertension:

From a biological standpoint, hypertension is one of the major modifiable contributors to CAD (Weber et al., 2016). In the United States, 54% of the African American community has been diagnosed with hypertension due to excess strain from socioeconomic reasons like racism, making them more susceptible to CAD (CDC, 2023).

## II. Diabetes:

Approximately 18.7% of African Americans in the U.S. have Type-2 Diabetes Mellitus (T2DM) (ADA 2023), which in turn directly contributes to CAD (*Cardiovascular Disease and Diabetes*, n.d.). This stems from high blood glucose levels from T2DM that can damage major blood vessels that control the heart (*Diabetes, Heart Disease, & Stroke*, 2023). African Americans are nearly twice as likely to develop this type of diabetes based on the Coronary Artery Risk Development in Young Adults study ("*Factors Contributing to Higher Incidence of Diabetes for Black Americans"*, 2018).

## III. Obesity:

Approximately 44% of all African Americans in the U.S. accounted for obesity, which alone is a vital risk factor for CAD (*Obesity Rates U.S. Adults by Race/ethnicity 2021*, n.d.). However, as obesity leads to a high amount of low-density lipoprotein cholesterol (LDL-C), it can make the community vulnerable to CAD. LDL-C is a risk factor for CAD as it is the primary source of blockage found in the coronary arteries (Lettre et al., 2011).

## IV. Dyslipidemia*:*

Dyslipidemia, which causes imbalances in many lipids (Pappan & Rehman, 2022), is excessively found among African Americans, disadvantageously establishing a

high chance of CAD (Hedayatnia et al., 2020). African Americans tend to admit more LDL-C and less high-density lipoprotein cholesterol (HDL-C) compared to other subgroups, as approximately 33% of African Americans had high levels of LDL-C and 10% had very low levels of HDL-C, based on a cohort study (Frank et al., 2014). This makes the community more prone to CAD.

V. **Smoking*:***

A genome-wide association study of African American cohorts performed by the National Heart, Lung, and Blood Institute concluded that cigarette smoking is a risk factor that can cause CAD as it increases the formation of LDL-C and other plaque in blood vessels (Lettre et al., 2011). While there is no significant difference in smoking between African Americans (11.7%) and the White population (12.9%) (CDC 2023), studies find that African Americans are exposed to more secondhand smoking due to residing in environments with fewer smoke-free laws and tending to use smoking products that are more addictive (Carnethon et al. 2017), inclining them to CAD.

***Genetics and Biological Factors***

Genetics also plays a significant role in an individual's risk for CAD and is considered a major influence in the development of other CVDs. Previous studies have shown that CAD is 40% to 60% inheritable (McPherson and Tybjaerg-Hansen 2016). Genetics also serve as a factor in understanding the discrepancies of CAD in specifically African American populations. Research is limited in these areas because African Americans are often underrepresented in cardiovascular clinical studies (Maraboto and Ferdinand 2020). By understanding the underlying pathophysiologic mechanisms of CAD, healthcare providers can identify the optimal approach to deliver the best care to African American patients. The main cause of CVD is hypertension

(HTN). It affects 29% of adults, and is disproportionately present in African Americans, with a 45% prevalence (Zilbermint et al. 2019). HTN greatly increases the risk of CAD, as it disrupts the endothelial system. Scientists have found two genetic and biological sources of the increased HTN gene in African Americans (Zilbermint et al. 2019). Hypertension induces high blood pressure which can cause CAD because it adds force to the artery walls. Thus, being at a higher risk of HTN directly influences an individual's likelihood of contracting CAD. By understanding the several genetic and biological factors that influence CAD levels in African American populations, healthcare providers can efficiently educate communities on how to prevent these diseases, reinforcing the need for precise medicine and individualized treatments tailored towards a patient's background.

***Social Determinants of Health (SDOH)***

Social Determinants of Health (SDOH) are conditions in which people live that affect and shape their health (Artiga and Hinton 2018). The SDOH assists in explaining why certain populations or demographics are oftentimes more susceptible to particular health outcomes, **as seen in Figure 1** with CAD.

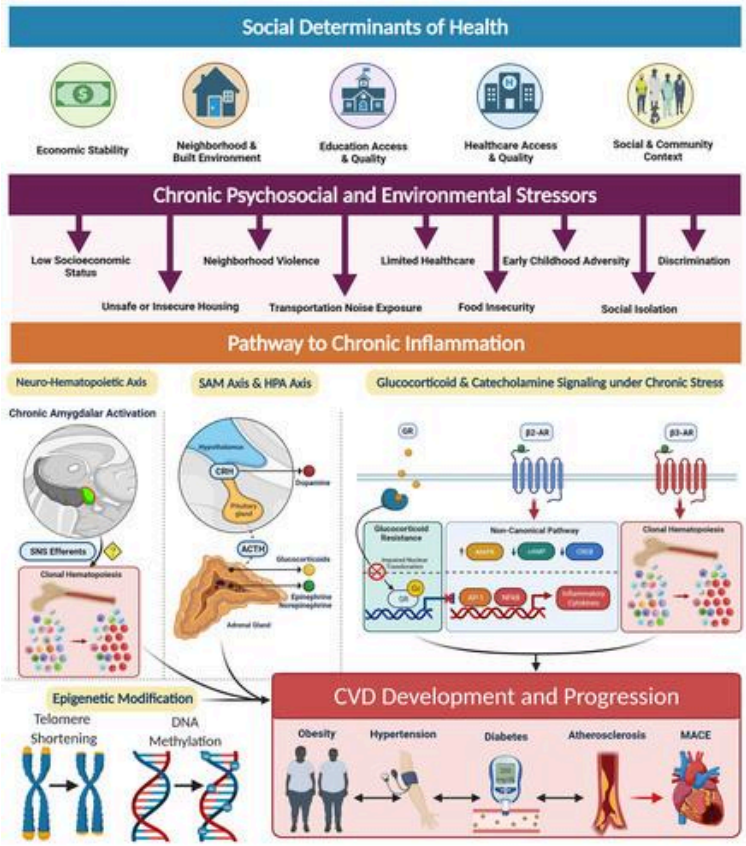


**Figure 1.** Showcases how the several SDOHs develop a complex series of risk factors for individuals. These risk factors can increase the likelihood of developing CAD, depending on the number and severity of the determinants (Powell-Wiley et al. 2022).

Interestingly, African American adults are more than twice as likely to die of CVD than White adults, yet formal literature on the relationship between the determinants and CVD is rare (Javed et al. 2022). Following are SDOHs that are associated with CAD in the African American Community.

## I. Environment*:*

Hypertension affects African Americans living in the United States disproportionately compared to those from the rural Caribbean or continental Africa (Maraboto and Ferdinand

2020). Residential segregation and redlining laws have discouraged ownership by African American individuals and continue to perpetuate today, predisposing African Americans to unsafe and underfunded neighborhoods, thus increasing their chances of CVD (Sistrunk et al., 2022). Specifically, one longitudinal study of over 5,000 middle-aged and older Black adults reported that over a 10-year period, neighborhood-level segregation was associated with a 12% increased risk of CVD in Black, compared with White patients (Javed et al. 2022). Oftentimes, features of neighborhoods like green spaces and vegetation are not available in African American neighborhoods, limiting opportunities for physical activity, social contact, and stress management that could reduce risks for CAD (Powell-Wiley et al. 2022).

Furthermore, mobility barriers and access to nonemergency medical transportation greatly decrease the availability of hospitals to African Americans (Javed et al. 2022). Over 3.6 million Americans, including a large portion of the African American population, cannot obtain equitable medical care because of a lack of proper nonemergency medical transportation (Wallace et al., 2005). This drastically decreases individuals' access to healthcare facilities, simultaneously putting them more at risk of several CAD risk factors. This is also the case with grocery stores and fresh food sources. One out of every five African American households is situated in a food desert, making grocery store accessibility harder, and strengthening poor nutrition (Chui et al., 2021). Thus, it is crucial that access to nonemergency medical transportation is increased in areas of need.

**II. Socioeconomic:**

Socioeconomic status is one of the strongest determinants of CAD. With historic discriminatory practices against African Americans such as the Jim Crow laws and exclusive hiring practices and social welfare benefits, these structural barriers might predispose African

Americans to unstable socioeconomic conditions today. A lack of proper health care and health insurance can greatly affect racial minorities (Sambamoorthi & McAlpine, 2003). This limits access to healthcare through limited financial resources and insurance coverage. These sociodemographic and psychosocial factors can lead to a higher chance of CVD mortality within the African American population (Frierson et al., 2013) and are high predictors of CVD risk factors, including diabetes and hypertension (Javed et al. 2022). According to a study in the Frontiers of Cardiovascular Medicine, redlining and zoning significantly restrict access to quality healthcare, causing disparities and not allowing these populations to receive treatment from CAD (Sistrunk et al., 2022).

**III. Education:**

Education is a critical SDOH that can play an essential role in health outcomes. Lack of education within patient populations can prevent efficient physician and patient communication, reducing the effectiveness of CAD prevention or treatments (Zwack & Smith. 2023). Furthermore, inadequate education can lead to problems with medical and drug adherence. Medical nonadherence contributes to the disproportionate rates of CAD in African Americans by preventing the treatment of diseases, chronically worsening the original condition and also increasing the risk for other diseases. Ensuring adherence to and affordable treatments are key to reducing rates of cardiovascular disease in African Americans (Ferdinand et al. 2017).

**IV. Social Support Networks:**

Social support networks are one of the most influential SDOHs. This involves a network of people such as neighbors, family, and friends that are available to support individuals with their health and wellness. In a study done to see the effects of social networks on cardiac health, it was found that low social support or being unmarried were independent risk factors of a poor

prognosis(Compare et al. 2013). Social support is essential for positive CVD health, but the structural barriers that have caused African Americans to be stuck in poverty-ridden neighborhoods deter this (Javed et al. 2022).

As discussed earlier in the socioeconomic section, African Americans are more likely to be subject to poor economic conditions, affecting their neighborhoods. This affects social networks as well. Research has found a strong correlation between socioeconomic depravity and small/poor social networks (Javed et al. 2022). On top of poor social networks, African Americans tend to live in more crime-filled areas. Both perceived neighborhood social cohesion and violence have been associated with coronary heart disease and stroke (Powell-Wiley et al. 2022). To structure effective interventions for patients, the SDOH factor of social support networks must be taken into consideration. Identifying and reinforcing social networks are crucial for improving medical adherence as well as overall prognosis(Compare et al. 2013).

***Cultural Behaviors***

The beliefs and practices of a community can make them more susceptible to certain conditions than other populations. In the African American community, this is no exception, as cultural attitudes toward their diet, physical exercise, and sleep can increase their risk of cardiovascular disease.

One of the major issues risk factors for CAD is nutrition and diet. African Americans follow the cultural practice of consuming soul food which possesses high contents of fats and sugars. While soul food has some healthy components, it can also have a high content of fats and sugars (Carnethon et al. 2017). Sugars are especially harmful, as they contain fructose, which is high in calories, influences metabolic syndrome, and can increase one's risk of obesity. African

American populations are especially susceptible to the negative effects of sugar because of its affordability, an attractive choice for many living in impoverished conditions (Saab et al. 2015).

Lack of physical exercise further affects the cardiovascular health of African Americans: data suggests that African Americans do not generally meet the suggested physical exercise levels, and prefer more sedentary activities, such as watching television. This is largely concerning cultural beliefs, where physical exercise can be seen as a chore. Income and interpersonal barriers are also contributors to the lack of physical activity in African American communities, due to the lack of access to exercise spaces (Carnethon et al. 2017).

Sleep habits and length are also important determinants of CAD. Sleeping for a short period or a long time can increase the risk of cardiovascular disease. Interestingly, African Americans have higher rates of fluctuating sleep cycles compared to other ethnicities, increasing their risk of cardiovascular disease (Carnethon et al. 2017). While stress affects sleep durations, its biological effects can separately be linked to a higher risk of cardiovascular disease. Specifically, psychosocial stress can cause higher amygdala activity and arterial inflammation, which are both risk factors for cardiovascular disease. This psychosocial stress is often directly a result of an individual's socioeconomic status (Tawakol et al. 2019), affecting the African American community significantly, as the Pew Research Center finds that they are two times more likely to live in poverty than white populations (Pew Research Center's Social & Demographic Trends Project, 2016).

Due to the traditional norms for African Americans in terms of diet, physical exercise, and sleep, there are higher rates of cardiovascular disease and risk factors in the community, African Americans must be educated on the potential harms of these practices to lead a healthier lifestyle.

***Socioecological Model***

Efforts must be taken to prevent and treat cardiovascular disease in African American populations, especially through intervention projects. The socioecological model describes the various levels at which an intervention can target a certain issue: individual, interpersonal, community, organizational, and policy. Though there are several layers, for any intervention to be successful, the community that is being targeted must be fully understood. Through this, mutual trust and respect can be built in the community for the intervention. Communities should thoroughly be informed about the goals and values of the intervention, to foster a more valuable relationship, overall nurturing better results (Taylor et al. 2018).

Project Joy, a study to promote cardiovascular health involved African American women in churches, with three different groups and varying levels of interactions and guidance involved (Yanek et al. 2001). Another study, FAITH!, involved an effort to create a mobile app that could help enhance users' cardiovascular health. To create the app, they engaged with the African American population on a community and individual level, involving church partners as well as community members to give feedback on the app throughout the entire process, customizing it to the community's needs. They found that personalized advice directly from the community overall improved the user experience of the mobile app (Brewer et al. 2019). This highlights the importance of a community-based intervention that involves guidance as well as support from other participants. Not only that, but interventions must also connect with participants on an individual level, based on their preferences and beliefs, which can further motivate them to enhance their cardiovascular well-being. In regards to cardiovascular disease in the African American community, engaging in these strategies will ensure a positive outcome from a cardiovascular health intervention.

For a cardiovascular intervention to be successful, it must address the different factors that affect each level. For example, on the individual level, genetic factors can contribute to cardiovascular health. An intervention that could target this would involve education regarding the prevention of cardiovascular disease to minimize other risk factors. Or, various cultural behaviors on the individual level could also determine health outcomes. An intervention to address this could involve designing a mobile app to help individuals lead healthier lifestyles. On the interpersonal level, communication with healthcare providers can be difficult, so increased awareness could help make healthcare provider conversations easier. On the community level, neighborhood environments might be unideal, and an intervention could focus on designing exercise spaces or smoke-free areas to reduce the prevalence of risk factors. Finally, various influences due to technology and social media can impact one's cardiovascular health, so leveraging social media to spread awareness about the importance of caring for one's cardiovascular health could be an intervention strategy to combat it (Gooding et al. 2020).

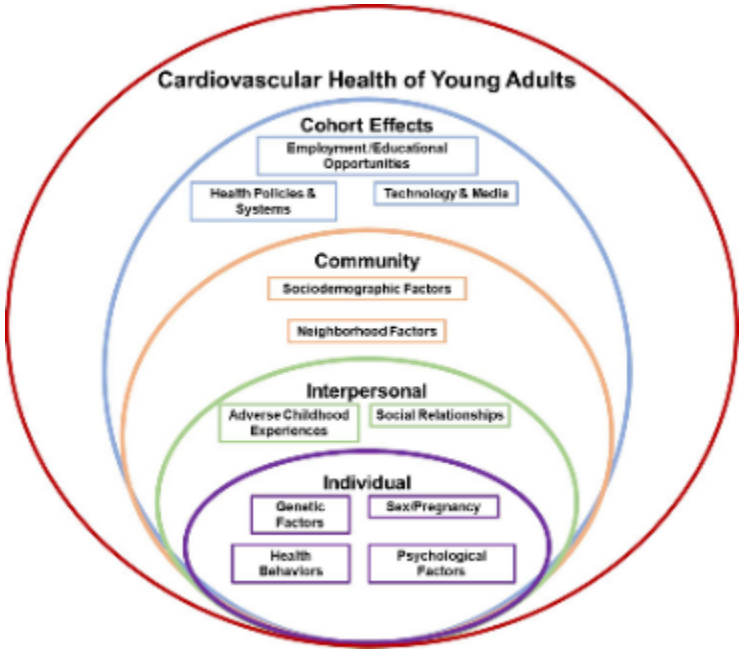

**Figure 2**. Factors that should be addressed by a cardiovascular health intervention at different levels of the socioecological model (Gooding et al. 2020)

Overall, the various risk factors and behaviors in African American communities that increase their risk of cardiovascular disease must be taken into account when implementing an intervention. The different layers of the socioecological model should then be used to determine the most effective initiatives that can be taken at each level to better cardiovascular health in African American populations.

### *Health Implications*

CVD, more primarily CAD, is a primary cause of death worldwide, accounting for a considerable proportion of premature fatalities. Therefore, along with such limitations, CAD significantly damages both physical and mental functioning. (Britton et al., 2012). A recent study found that 9.2% have lower physical health scores, 2.4% lower mental health scores and 4.6% lower health utility scores. (Bell et al., 2019). These factors impact the quality of life for African Americans. For example, they are more susceptible to developing other diseases, such as kidney failure than any other race. (*Race/ethnicity – Kidney Disease Risk Factors*, 2021). Even with CAD, African Americans are prone to other comorbid conditions such as hypertension, diabetes, obesity, and etc. These comorbidities then impact factors such as disease management, treatment outcomes and overall health. For example, life expectancy for African Americans decreased by 3.4 years in 2012 (Carnethon et al., 2017), illustrating the drastic impact of such diseases. Obesity has serious health consequences, including its link to hypertension, T2DM, metabolic syndrome, and dyslipidemia, all of which are independent risk factors for coronary artery disease (CAD). Despite the increased risk of acquiring CAD, a "obesity paradox" has been documented

in recent years, in which moderately obese people with established cardiovascular disease, including CAD, appear to have mortality rates comparable to their normal-weight counterparts. ("The Relationship between Obesity and Coronary Artery Disease," 2014). Studies have shown that irregular eating habits appear to be less advantageous for achieving a healthy cardiometabolic profile. (St-Onge et al., 2017)

Within all these circumstances, it is extremely important to create prevention strategies and health promotion efforts in reducing the burden of CAD within the African American community. Creating lifestyle modifications help in early detection, and help managing risk factors.

***Existing Interventions***

As new studies and health implications are on the constant horizon, interventions and active action plans to better understand, aid, and distribute the necessary medication for specific CVD concerns have been as well. By applying interventions at several levels, it is possible to address the complex interaction of factors causing CVD and encourage holistic approaches to prevention and care.

Since 2004, The Cardiac Hospital Atherosclerosis Management Program (CHAMP) focused on initiating aspirin and HDL cholesterol to people with need (Fonarow et al., 2001), have aimed to promote cardiovascular health by preventing risk acquisition and augmentation, detecting and reducing risk, managing CVD events, and preventing disease progression and recurrence of CVD events.

Moreover, in 2010, a few have included taking advantage of opportunities for intervention at all stages of life to promote cardiovascular health by preventing risk acquisition and augmentation, detecting and reducing risk, managing CVD events, and preventing disease

progression and recurrence of CVD, such as CAD events. Policies and initiatives to address the risk factors for CVD and CAD have been implemented through population-wide approaches, interventions within health systems, and community-based programs with components in schools, workplaces, and other community settings. (See Figure 1). (Institute of Medicine (US) Committee on Preventing the Global Epidemic of Cardiovascular Disease: Meeting the Challenges in Developing Countries et al., 2010).

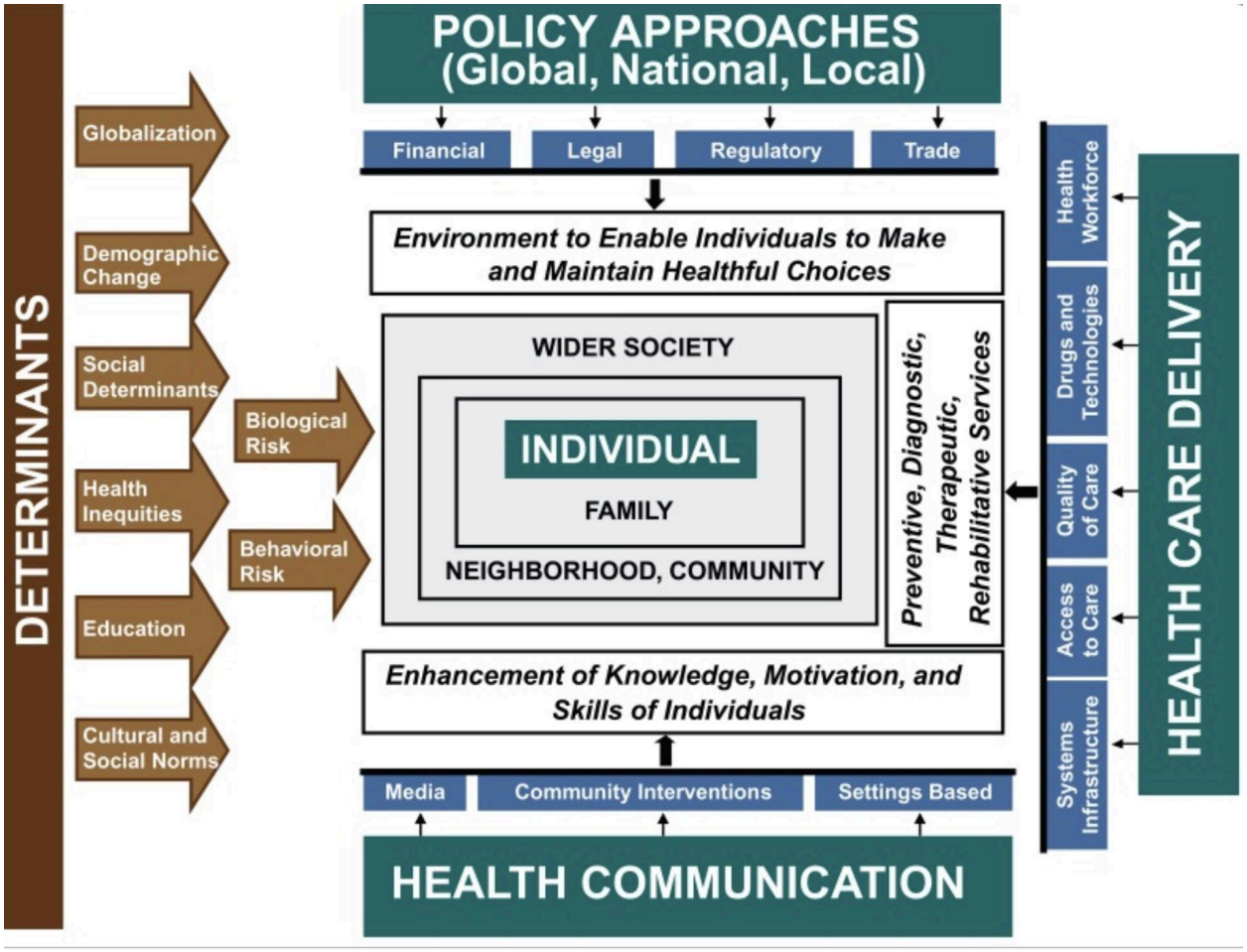


Figure 1: Showcases how and why interventions for CAD should take place depending on the numerous circumstances, ultimately driving the organization to act on them. (Institute of Medicine (US) Committee on Preventing the Global Epidemic of Cardiovascular Disease: Meeting the Challenges in Developing Countries et al., 2010).

Then in 2018, physical activities in relation to obesity and food lifestyles actions took place for CAD awareness, such as Clinician's Guides. (Pallazola et al., 2019). For example, community outreach programs and health literacy campaigns to promote knowledge and understanding, specifically for African Americans are plastered throughout the community, such as “Spirit Of the Heart”. (*Community Programs*, n.d.). The program has international program series to educate African Americans all over the world, accredited by the Accreditation Council among other awards, and have participated in actively creating other major programs, such as “Harlem Heart Healthy Workshop”, “New Cardiovascular Disease Registry to Support Care for Underserved.” and Strategic Partnership to Increase Investigator Diversity in Clinical Trials”, along with others. (*Spirit of the Heart*, n.d.)

Within these interventions, they focus on managing and controlling CAD risk factors among African Americans. Through easily accessible articles it mentions diabetes, hypertension, etc. With simple lifestyle modifications, and medication adherence it will improve health outcomes. (Allison, 2022). Having interventions that aim to improve access to healthcare services by brochures, signing up for information meetings help in supporting patients in adopting healthy behaviors. (*About Bad Cholesterol*, n.d.). Furthermore, having personalized Q and A sessions for heart health for African Americans solidifies the impact further. (Weiss, 2023).

The Hearts of Sonoma County Initiative (HSC) is another effective CVD initiative that engages with many sectors to achieve effective and sustainable solutions by offering outcomes and lessons. HSC conducted activities in both communities and clinical systems to engage primary care clinicians in the management of CVD risk factors. Community activities include blood pressure screenings by community health workers and a local heart disease prevention

campaign. (Cheadle, 2019) .They then observed positive trends in blood pressure control among hypertensive patients in the collaborating health systems, with patients with managed blood pressure increasing from 58% in 2014 to 67% in 2016. (Shah, 2017.)

Furthermore, Strategic public health programs are designed to reduce CAD risk factors. The Heart Disease of the Wisconsin Department of Health Services, advocates by partnering with communities, health systems, health care providers, insurers, and professional organizations to improve heart disease prevention and management through the nationally recognized program, Chronic Disease Prevention Program (CDPP). This program has multiple subprograms in between to aid Medication therapy management (MTM), Community health worker (CHW) infrastructure and sustainability, Self-measured blood pressure monitoring, Cardiac rehabilitation, Team-based care, and Electronic health records, health information technology, and quality measures. CDPP then partners with other prominent associations and programs. It also provides professional resources to those in need of help. (*Heart Disease*, 2016)

Although these measurement approaches provide valuable insights, they also have inherent strengths and limitations. Most CVD interventions lack the bridge to CAD and African American populations, truly illustrating the gap and need for further applications to take place. While there are a few active approaches taking place, that amount is incomprehensible to the amount of individuals suffering.

Overall, these programs and policies seek to address the multidimensional character of CAD by utilizing a variety of tactics and methodologies, having helped millions of struggling African Americans, but it is imperative to continue advocating for this growing disparity.

***Conclusion***

In the 1960s, CAD was obscure and deadly, killing millions with a lack of information known about it. Although CAD to this day remains the number one killer of men and women in the United States and a major killer worldwide, CAD death rates have decreased by nearly 60% since this time (Jones & Greene, 2012), a sign of steady progress from its once obscurity in the past. With new breakthroughs in medicine, equitable healthcare, and education against risk factors (Unal et al., 2004), awareness and treatment for CAD is increasing. And although progress as a whole is being made, progress is minimal within the African American population. The decline in CAD prevalence in African Americans is far less than that of the white population, and African Americans are still the most vulnerable to CAD (Carnethon et al., 2017) Through a comprehensive understanding of risk factors such as HTN, impacts of the sDoH, cultural norms, the socioecological model, health implications, and health interventions pertaining to the African American population, this literature shed light to a broader understanding of why the African American population is disproportionately affected by CAD in comparison to other ethnic groups. In the future, more in-depth research, case studies, and health-based interventions must be developed within African American communities to better understand effective strategies and intervention plans to combat their vulnerability. Community engagement, awareness, education, and personal connection in specific regard to Cardiovascular issues within the African American community can help guide a community-based intervention in the future.

**References**

*1. Demographic trends and economic well-being*. (2016, June 27). Pew Research Center's Social & Demographic Trends Project. https://www.pewresearch.org/social-trends/2016/06/27/1-demographic-trends-and-economic-well-being/

Allison, C. (2022, February 4). *What to know about heart disease risk for African Americans*. NewYork-Presbyterian. https://healthmatters.nyp.org/what-to-know-about-heart-disease-risk-for-african-americans/

Artiga, S., & Hinton, E. (2018, May 10). *Beyond health care: The role of social determinants in promoting health and health equity*. KFF. https://www.kff.org/racial-equity-and-health-policy/issue-brief/beyond-health-care-the-role-of-social-determinants-in-promoting-health-and-health-equity/

Bell, S. L., Audrey, S., Gunnell, D., Cooper, A., & Campbell, R. (2019). The relationship between physical activity, mental wellbeing and symptoms of mental health disorder in adolescents: a cohort study. *The International Journal of Behavioral Nutrition and Physical Activity*, *16*(1), 138.

Brewer, L. C., Hayes, S. N., Caron, A. R., Derby, D. A., Breutzman, N. S., Wicks, A., Raman, J., Smith, C. M., Schaepe, K. S., Sheets, R. E., Jenkins, S. M., Lackore, K. A., Johnson, J., Jones, C., Radecki Breitkopf, C., Cooper, L. A., & Patten, C. A. (2019). Promoting cardiovascular health and wellness among African-Americans: Community participatory approach to design an innovative mobile-health intervention. *PloS One*, *14*(8), e0218724.

Britton, A., Brunner, E., Kivimaki, M., & Shipley, M. J. (2012). Limitations to functioning and independent living after the onset of coronary heart disease: what is the role of lifestyle factors and obesity? *European Journal of Public Health*, *22*(6), 831–835.

Brown, J. C., Gerhardt, T. E., & Kwon, E. (2023). *Risk Factors for Coronary Artery Disease*. StatPearls Publishing.

Carnethon, M. R., Pu, J., Howard, G., Albert, M. A., Anderson, C. A. M., Bertoni, A. G., Mujahid, M. S., Palaniappan, L., Taylor, H. A., Jr, Willis, M., Yancy, C. W., & American Heart Association Council on Epidemiology and Prevention; Council on Cardiovascular Disease in the Young; Council on Cardiovascular and Stroke Nursing; Council on Clinical Cardiology; Council on Functional Genomics and Translational Biology; and Stroke Council. (2017). Cardiovascular

Health in African Americans: A Scientific Statement From the American Heart Association. *Circulation*, *136*(21), e393–e423.

CDC. (2022, December 6). *Coronary artery disease*. Centers for Disease Control and Prevention. https://www.cdc.gov/heartdisease/coronary_ad.htm

Cheadle, A., Rosaschi, M., Burden, D., Ferguson, M., Greaves, B., Houston, L., McClendon, J., Minkoff, J., Jones, M., Schwartz, P., Nudelman, J., & Maddux-Gonzalez, M. (2019). A Community-Wide Collaboration to Reduce Cardiovascular Disease Risk: The Hearts of Sonoma County Initiative. *Preventing Chronic Disease*, *16*, E89.

Clark, L. T., Ferdinand, K. C., Flack, J. M., Gavin, J. R., 3rd, Hall, W. D., Kumanyika, S. K., Reed, J. W., Saunders, E., Valantine, H. A., Watson, K., Wenger, N. K., & Wright, J. T. (2001). Coronary heart disease in African Americans. *Heart Disease* , *3*(2), 97–108.

*Community Programs*. (n.d.). Association of Black Cardiologists. Retrieved June 25, 2023, from https://abcardio.org/community-programs/

Compare, A., Zarbo, C., Manzoni, G. M., Castelnuovo, G., Baldassari, E., Bonardi, A., Callus, E., & Romagnoni, C. (2013). Social support, depression, and heart disease: a ten year literature review. *Frontiers in Psychology*, *4*, 384.

*Diabetes, heart disease, & stroke*. (2023, June 7). National Institute of Diabetes and Digestive and Kidney Diseases; NIDDK - National Institute of Diabetes and Digestive and Kidney Diseases. https://www.niddk.nih.gov/health-information/diabetes/overview/preventing-problems/heart-disease-stroke

*Factors contributing to higher incidence of diabetes for black Americans*. (2018, January 8). National Institutes of Health (NIH). https://www.nih.gov/news-events/nih-research-matters/factors-contributing-higher-incidence-diabetes-black-americans

Fonarow, G. C., Gawlinski, A., Moughrabi, S., & Tillisch, J. H. (2001). Improved treatment of coronary heart disease by implementation of a Cardiac Hospitalization Atherosclerosis Management Program (CHAMP). *The American Journal of Cardiology*, *87*(7), 819–822.

Frank, A. T. H., Zhao, B., Jose, P. O., Azar, K. M. J., Fortmann, S. P., & Palaniappan, L. P. (2014). Racial/ethnic differences in dyslipidemia patterns. *Circulation*, *129*(5), 570–579.

Gooding, H. C., Gidding, S. S., Moran, A. E., Redmond, N., Allen, N. B., Bacha, F., Burns, T. L., Catov, J. M., Grandner, M. A., Harris, K. M., Johnson, H. M., Kiernan, M., Lewis, T. T., Matthews, K. A., Monaghan, M., Robinson, J. G., Tate, D., Bibbins-Domingo, K., & Spring, B. (2020). Challenges and Opportunities for the Prevention and Treatment of Cardiovascular Disease Among Young Adults: Report From a National Heart, Lung, and Blood Institute Working Group. *Journal of the American Heart Association*, *9*(19), e016115.

*Heart disease*. (2016, August 8). Wisconsin Department of Health Services. https://www.dhs.wisconsin.gov/heart-disease/index.htm

*Heart disease and stroke prevention*. (n.d.). Retrieved June 30, 2023, from https://www.health.ny.gov/diseases/cardiovascular/heart_disease/

Hedayatnia, M., Asadi, Z., Zare-Feyzabadi, R., Yaghooti-Khorasani, M., Ghazizadeh, H., Ghaffarian-Zirak, R., Nosrati-Tirkani, A., Mohammadi-Bajgiran, M., Rohban, M., Sadabadi, F., Rahimi, H.-R., Ghalandari, M., Ghaffari, M.-S., Yousefi, A., Pouresmaeili, E., Besharatlou, M.-R., Moohebati, M., Ferns, G. A., Esmaily, H., & Ghayour-Mobarhan, M. (2020). Dyslipidemia and cardiovascular disease risk among the MASHAD study population. *Lipids in Health and Disease*, *19*(1), 42.

Institute of Medicine (US) Committee on Preventing the Global Epidemic of Cardiovascular Disease: Meeting the Challenges in Developing Countries, Fuster, V., & Kelly, B. B. (2010). Reducing the Burden of Cardiovascular Disease: Intervention Approaches. In *Promoting Cardiovascular Health in the Developing World: A Critical Challenge to Achieve Global Health*. National Academies Press (US).

Jahangir, E., De Schutter, A., & Lavie, C. J. (2014). The relationship between obesity and coronary artery disease. *Translational Research: The Journal of Laboratory and Clinical Medicine*, *164*(4), 336–344.

Javed, Z., Haisum Maqsood, M., Yahya, T., Amin, Z., Acquah, I., Valero-Elizondo, J., Andrieni, J., Dubey, P., Jackson, R. K., Daffin, M. A., Cainzos-Achirica, M., Hyder, A. A., & Nasir, K. (2022). Race, Racism, and Cardiovascular Health: Applying a Social Determinants of Health Framework to Racial/Ethnic Disparities in Cardiovascular Disease. *Circulation. Cardiovascular Quality and Outcomes*, *15*(1), e007917.

Jones, D. S., & Greene, J. A. (2012). The contributions of prevention and treatment to the decline in cardiovascular mortality: lessons from a forty-year debate. *Health Affairs* , *31*(10), 2250–2258.

Kiberstis, P. A. (2017). Interfering with bad cholesterol. *Science*, *355*(6325), 592–593.

Lettre, G., Palmer, C. D., Young, T., Ejebe, K. G., Allayee, H., Benjamin, E. J., Bennett, F., Bowden, D. W., Chakravarti, A., Dreisbach, A., Farlow, D. N., Folsom, A. R., Fornage, M., Forrester, T., Fox, E., Haiman, C. A., Hartiala, J., Harris, T. B., Hazen, S. L., … Boerwinkle, E. (2011). Genome-wide association study of coronary heart disease and its risk factors in 8,090 African Americans: the NHLBI CARe Project. *PLoS Genetics*, *7*(2), e1001300.

Maraboto, C., & Ferdinand, K. C. (2020). Update on hypertension in African-Americans. *Progress in Cardiovascular Diseases*, *63*(1), 33–39.

McPherson, R., & Tybjaerg-Hansen, A. (2016). Genetics of Coronary Artery Disease. *Circulation Research*, *118*(4), 564–578.

Mensah, G. A. (2018a). Cardiovascular Diseases in African Americans: Fostering Community Partnerships to Stem the Tide. *American Journal of Kidney Diseases: The Official Journal of the National Kidney Foundation*, *72*(5 Suppl 1), S37–S42.

Mensah, G. A. (2018b). Cardiovascular Diseases in African Americans: Fostering Community Partnerships to Stem the Tide. *American Journal of Kidney Diseases: The Official Journal of the National Kidney Foundation*, *72*(5 Suppl 1), S37–S42.

*Obesity rates U.S. adults by race/ethnicity 2021*. (n.d.). Statista. Retrieved June 30, 2023, from https://www.statista.com/statistics/207436/overweight-and-obesity-rates-for-adults-by-ethnicity/

Pallazola, V. A., Davis, D. M., Whelton, S. P., Cardoso, R., Latina, J. M., Michos, E. D., Sarkar, S., Blumenthal, R. S., Arnett, D. K., Stone, N. J., & Welty, F. K. (2019). A Clinician's Guide to Healthy Eating for Cardiovascular Disease Prevention. *Mayo Clinic Proceedings. Innovations, Quality & Outcomes*, *3*(3), 251–267.

Pappan, N., & Rehman, A. (2022). *Dyslipidemia*. StatPearls Publishing.

Powell-Wiley, T. M., Baumer, Y., Baah, F. O., Baez, A. S., Farmer, N., Mahlobo, C. T., Pita, M. A., Potharaju, K. A., Tamura, K., & Wallen, G. R. (2022). Social Determinants of Cardiovascular Disease. *Circulation Research*, *130*(5), 782–799.

*Race/ethnicity – Kidney disease risk factors*. (2021, October 29). American Kidney Fund. https://www.kidneyfund.org/all-about-kidneys/risk-factors/raceethnicity-kidney-disease-risk-factors

Raffield, L. M., Lu, A. T., Szeto, M. D., Little, A., Grinde, K. E., Shaw, J., Auer, P. L., Cushman, M., Horvath, S., Irvin, M. R., Lange, E. M., Lange, L. A., Nickerson, D. A., Thornton, T. A., Wilson, J. G., Wheeler, M. M., Zakai, N. A., & Reiner, A. P. (2020). Coagulation factor VIII: Relationship to cardiovascular disease risk and whole genome sequence and epigenome‐wide analysis in African Americans. *Journal of Thrombosis and Haemostasis: JTH*, *18*(6), 1335–1347.

Ralapanawa, U., & Sivakanesan, R. (2021). Epidemiology and the Magnitude of Coronary Artery Disease and Acute Coronary Syndrome: A Narrative Review. *Journal of Epidemiology and Global Health*, *11*(2), 169–177.

Resnick, H. E., & Howard, B. V. (2002). Diabetes and cardiovascular disease. *Annual Review of Medicine*, *53*, 245–267.

Saab, K. R., Kendrick, J., Yracheta, J. M., Lanaspa, M. A., Pollard, M., & Johnson, R. J. (2015). New insights on the risk for cardiovascular disease in African Americans: the role of added sugars. *Journal of the American Society of Nephrology: JASN*, *26*(2), 247–257.

Shah, S. J., & Stafford, R. S. (2017). Current Trends of Hypertension Treatment in the United States. *American Journal of Hypertension*, *30*(10), 1008–1014.

*Spirit of the Heart*. (n.d.). Association of Black Cardiologists. Retrieved June 28, 2023, from https://abcardio.org/spirit-of-the-heart/

St-Onge, M.-P., Ard, J., Baskin, M. L., Chiuve, S. E., Johnson, H. M., Kris-Etherton, P., Varady, K., & American Heart Association Obesity Committee of the Council on Lifestyle and Cardiometabolic Health; Council on Cardiovascular Disease in the Young; Council on Clinical Cardiology; and Stroke Council. (2017). Meal Timing and Frequency: Implications for Cardiovascular Disease Prevention: A Scientific Statement From the American Heart Association. *Circulation*, *135*(9), e96–e121.

Tawakol, A., Osborne, M. T., Wang, Y., Hammed, B., Tung, B., Patrich, T., Oberfeld, B., Ishai, A., Shin, L. M., Nahrendorf, M., Warner, E. T., Wasfy, J., Fayad, Z. A., Koenen, K., Ridker, P. M., Pitman, R. K., & Armstrong, K. A. (2019). Stress-Associated Neurobiological Pathway Linking Socioeconomic Disparities to Cardiovascular Disease. *Journal of the American College of Cardiology*, *73*(25), 3243–3255.

Taylor, H. A., Henderson, F., Abbasi, A., & Clifford, G. (2018). Cardiovascular Disease in African Americans: Innovative Community Engagement for Research Recruitment and Impact. *American Journal of Kidney Diseases: The Official Journal of the National Kidney Foundation*,

*72*(5 Suppl 1), S43–S46.

Tsao, C. W., Aday, A. W., Almarzooq, Z. I., Anderson, C. A. M., Arora, P., Avery, C. L., Baker-Smith, C. M., Beaton, A. Z., Boehme, A. K., Buxton, A. E., Commodore-Mensah, Y., Elkind, M. S. V., Evenson, K. R., Eze-Nliam, C., Fugar, S., Generoso, G., Heard, D. G., Hiremath, S., Ho, J. E., … American Heart Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee. (2023). Heart Disease and Stroke Statistics-2023 Update: A Report From the American Heart Association. *Circulation*, *147*(8), e93–e621.

Unal, B., Critchley, J. A., & Capewell, S. (2004). Explaining the decline in coronary heart disease mortality in England and Wales between 1981 and 2000. *Circulation*, *109*(9), 1101–1107.

Weber, T., Lang, I., Zweiker, R., Horn, S., Wenzel, R. R., Watschinger, B., Slany, J., Eber, B., Roithinger, F. X., & Metzler, B. (2016). Hypertension and coronary artery disease: epidemiology, physiology, effects of treatment, and recommendations : A joint scientific statement from the Austrian Society of Cardiology and the Austrian Society of Hypertension. *Wiener Klinische Wochenschrift*, *128*(13-14), 467–479.

Weiss, C. (2023, April 27). *Mayo Clinic Q and A: African Americans and heart health*. Mayo Clinic News Network. https://newsnetwork.mayoclinic.org/discussion/mayo-clinic-q-and-a-african-americans-and-heart-health/

Yanek, L. R., Becker, D. M., Moy, T. F., Gittelsohn, J., & Koffman, D. M. (2001). Project Joy: faith based cardiovascular health promotion for African American women. *Public Health Reports*, *116 Suppl 1*(Suppl 1), 68–81.

Zilbermint, M., Hannah-Shmouni, F., & Stratakis, C. A. (2019). Genetics of Hypertension in African Americans and Others of African Descent. *International Journal of Molecular Sciences*, *20*(5). https://doi.org/10.3390/ijms20051081

Zwack, C. C., Smith, C., Poulsen, V., Raffoul, N., & Redfern, J. (2023). Information Needs and Communication Strategies for People with Coronary Heart Disease: A Scoping Review. *International Journal of Environmental Research and Public Health*, *20*(3). https://doi.org/10.3390/ijerph20031723