

Review

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Review

Cultural Determinants of Hypertension and Heart Failure Management: Implications for Long-Term Outcomes

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Abstract

Hypertension and heart failure are leading causes of morbidity and mortality worldwide, with disproportionately worse outcomes among culturally diverse and socioeconomically marginalized populations. Cultural determinants—including health beliefs, dietary traditions, language barriers, trust in healthcare systems, family dynamics, and perceptions of chronic illness—significantly influence disease recognition, treatment adherence, and long-term cardiovascular outcomes. This narrative review synthesizes current evidence on how cultural, structural, and social factors shape the management of hypertension and heart failure across diverse groups such as immigrants, racial and ethnic minorities, and individuals experiencing housing instability. Existing literature demonstrates that culturally discordant care, limited health literacy, and structural inequities are associated with poor blood pressure control, delayed diagnosis, reduced medication adherence, and higher rates of hospitalization and mortality, whereas culturally tailored interventions—including community health worker engagement, linguistically concordant education, faith-based partnerships, and culturally adapted dietary counseling—improve self-management behaviors and clinical outcomes. The findings underscore the need to integrate cultural competence and structural awareness into cardiovascular care delivery, clinical training, and health policy, emphasizing that addressing cultural determinants is both an ethical obligation and a clinically necessary strategy for improving long-term outcomes in chronic cardiovascular disease.

Keywords: chronic disease management; hypertension; culturally tailored interventions

Introduction

Hypertension and heart failure represent leading causes of cardiovascular morbidity and mortality globally, with disproportionate burden among culturally diverse and socioeconomically marginalized populations [1,2]. The disparities are stark: Black individuals in the United States face up to 4-fold higher cardiovascular disease mortality compared to White individuals, and Black adults demonstrate hypertension prevalence rates significantly exceeding those of other racial groups, with earlier onset and greater attributable cardiovascular risk [1,3,4]. These inequities persist despite advances in evidence-based therapies, reflecting the profound influence of cultural, structural, and social determinants on disease recognition, treatment engagement, and long-term outcomes.

Cultural determinants encompass health beliefs, dietary traditions, language barriers, trust in healthcare systems, family dynamics, and illness perceptions—factors that fundamentally shape how individuals understand, access, and adhere to cardiovascular care [3,5]. This review synthesizes current evidence on how these determinants influence hypertension and heart failure management across diverse populations, including immigrants, racial and ethnic minorities, and individuals experiencing housing instability, while highlighting effective culturally tailored interventions.

Epidemiology and Burden of Disparities

Hypertension Disparities

Black adults demonstrate the highest prevalence of hypertension in the United States and experience an earlier age of onset, greater disease severity, and more pronounced downstream cardiovascular complications compared with other racial and ethnic groups. These disparities contribute substantially to excess risks of stroke, heart failure, chronic kidney disease, and cardiovascular mortality [3,4]. Evidence from the REGARDS study further highlights inequities in treatment effectiveness, showing that among adults already taking antihypertensive medication, 33.7% of Black participants had uncontrolled blood pressure compared with 25.4% of White participants, underscoring persistent gaps in disease control despite therapy [6].

Recent national analyses indicate that overall blood pressure control rates in the United States have declined in recent years, a trend driven largely by worsening control among Black individuals [7]. These patterns suggest that structural determinants—including differences in access to care, medication affordability, treatment adherence, environmental stressors, and social determinants of health—play a major role in sustaining inequities beyond biological risk alone. Collectively, these findings position hypertension disparities as a central contributor to broader cardiovascular inequities in the U.S. population.

Hispanic populations face distinct cardiovascular risk patterns shaped in part by acculturation, which has been associated with increased prevalence of obesity, sedentary behavior, hypertension, and diabetes over time in the United States [7]. This shift illustrates how environmental and behavioral exposures interact with migration and sociocultural change to influence cardiometabolic health. Similarly, Southeast Asian and Pacific Islander populations demonstrate disproportionately high rates of diabetes, a condition strongly linked to adverse heart failure outcomes and accelerated cardiovascular disease progression [3].

In addition, infectious etiologies contribute uniquely to cardiovascular risk among immigrant populations. It is estimated that 50,000–350,000 immigrants from Mexico and Central America may harbor asymptomatic *Trypanosoma cruzi* infection, with approximately 20% progressing to Chagas cardiomyopathy, a potentially severe and underrecognized cause of heart failure in the United States [3]. The presence of such conditions highlights the importance of culturally informed screening strategies and clinician awareness of geographically linked cardiovascular diseases within diverse communities.

Heart Failure Disparities

The burden of heart failure is not evenly distributed across populations. The highest incidence rates consistently occur among self-identified Black patients, who also experience greater hospitalization frequency and higher mortality compared with White patients [3]. Alarming, this disparity has widened over time, particularly among younger Black men, suggesting worsening inequities in prevention, early detection, and long-term disease management [3]. These trends indicate that social and structural determinants—including healthcare access, insurance coverage, neighborhood resources, and chronic stress exposure—likely contribute to earlier disease onset and more severe clinical trajectories.

Sex-based disparities further complicate heart failure outcomes. Although women with heart failure generally demonstrate more favorable survival than men, they face reduced access to specialty cardiovascular care, are less likely to receive comprehensive discharge instructions, and have lower rates of referral for advanced therapies such as heart transplantation [3]. These inequities suggest that improved survival alone does not equate to equitable care and highlight persistent gender-related gaps in treatment intensity, referral patterns, and healthcare delivery.

Taken together, disparities in hypertension and heart failure reflect the complex interaction of biological risk, social determinants of health, healthcare access, and systemic inequities. Addressing these gaps will require multifaceted interventions that integrate equitable prevention strategies, culturally competent care delivery, improved screening for high-risk conditions, and structural reforms targeting the broader determinants of cardiovascular health.

Cultural and Structural Determinants

Social Determinants of Health

Social determinants of health play a central role in shaping racial disparities in cardiovascular disease. In the REGARDS study, these determinants accounted for 33% of the Black–White difference in uncontrolled blood pressure, underscoring the substantial influence of structural and socioeconomic conditions on hypertension outcomes [6]. Specific mediating contributors included low annual household income (15.8%), low educational attainment (10.5%), residence in health professional shortage areas (10.4%), disadvantaged neighborhoods (11.0%), and high-poverty zip codes (9.7%) [6]. Collectively, these findings illustrate that unequal exposure to economic hardship, limited educational opportunity, and constrained healthcare infrastructure significantly shape the distribution and control of hypertension across populations.

Conversely, protective structural factors—including higher educational attainment, stable health insurance coverage, increased income, and residence in resource-rich neighborhoods—were consistently associated with lower hypertension prevalence and improved blood pressure control [2]. These associations highlight the importance of upstream policy and community-level interventions, suggesting that durable improvements in cardiovascular outcomes require addressing social and economic inequities in addition to clinical treatment alone.

Among individuals living with heart failure, adverse social conditions similarly influence morbidity and mortality. Low income, social isolation, and absence of caregiver support are associated with increased mortality risk and diminished quality of life, reflecting the essential role of social networks and material stability in chronic disease management [3]. Structural vulnerabilities—including homelessness, substance use, food insecurity, and limited transportation access—create additional barriers to medication adherence, follow-up care, and symptom monitoring [3]. Importantly, these social drivers of disease severity emphasize that biological or genetic explanations should not be inferred from race or ethnicity alone, reinforcing the need to interpret cardiovascular disparities within broader structural and environmental contexts [3].

Healthcare Access and System-Level Barriers

Inequities in healthcare access remain a major obstacle to improving hypertension and cardiovascular outcomes among racial and ethnic minority populations. Persistent disparities in insurance coverage, care availability, and healthcare utilization limit both preventive services and effective chronic disease management [4]. In 2019, Black (9.6%) and Hispanic (16.7%) individuals were substantially more likely to be uninsured compared with White (5.2%) and Asian (6.2%) individuals, demonstrating clear structural inequities in financial access to care [4]. Consistent with these findings, the 2016 National Healthcare Quality and Disparities Report showed that Black adults experienced worse access to care than White adults on 50% of measured indicators, while Hispanic adults experienced worse access on 75% of indicators, reflecting pervasive and systemic barriers across multiple dimensions of healthcare delivery [4].

Continuity of care also plays a decisive role in hypertension control. Adults reporting a usual healthcare facility achieved 48.4% blood pressure control, compared with 26.5% among those without a regular source of care (adjusted prevalence ratio 1.48) [4]. This substantial difference highlights the importance of stable primary care relationships for medication titration, preventive counseling, and long-term disease monitoring.

Disparities extend beyond primary care into specialty and advanced cardiovascular services. Black patients with heart failure are less likely to receive cardiology care during intensive care unit admissions, experience reduced access to specialized inpatient services, and may encounter clinician bias during evaluation for advanced therapies, including mechanical circulatory support or transplantation [3]. These inequities suggest that differences in clinical decision-making, referral pathways, and institutional resources may contribute to unequal outcomes even within hospital settings.

Hispanic patients may face language barriers and limited access to culturally and linguistically appropriate healthcare services, which can delay diagnosis, reduce treatment adherence, and

ultimately contribute to poorer cardiovascular outcomes. Such barriers underscore the importance of interpreter services, culturally competent communication, and community-engaged care models in improving chronic disease management. Together, these patterns demonstrate that consistent primary care access, equitable specialty referral, and culturally responsive healthcare delivery are critical components of reducing cardiovascular disparities across diverse populations.

The persistent cardiovascular disparities outlined above—rooted in social determinants of health, structural inequities, and unequal healthcare access—underscore the limitations of traditional, one-size-fits-all clinical approaches to hypertension and heart failure management. Evidence that socioeconomic conditions, neighborhood environments, language barriers, and differential access to specialty care substantially influence disease outcomes suggests that meaningful improvement requires interventions extending beyond standard biomedical treatment alone. In this context, culturally tailored strategies have emerged as a critical avenue for reducing inequities by aligning prevention, education, and care delivery with the social realities, cultural values, and communication needs of diverse populations. The following section therefore examines the growing body of evidence supporting culturally tailored interventions as an essential component of equitable cardiovascular care and long-term population health improvement.

Policy and Health System Implications

The evidence demonstrating the effectiveness of culturally tailored interventions is compelling and consistent. Achieving cardiovascular health equity requires recognizing that culturally tailored interventions are not optional enhancements but essential components of equitable cardiovascular care and long-term population health improvement. This necessitates fundamental transformation in how cardiovascular care is financed, delivered, and evaluated, with structural investment in health system redesign, workforce development, and policy reform [5,8].

The Clinical and Economic Imperative for Culturally Tailored Care

Culturally tailored interventions demonstrate both clinical effectiveness and cost-effectiveness across diverse populations and settings. A culturally tailored health education program for South Asian patients achieved significant improvements in cardiovascular risk factors sustained over median 6.9 years of follow-up, with significant reductions in revascularization (OR 0.33, 95% CI 0.14-0.78) and mortality (OR 0.41, 95% CI 0.22-0.79), demonstrating that culturally tailored health education has efficacy in improving cardiovascular risk factors and reducing major adverse cardiovascular events [9].

Economic analyses consistently demonstrate favorable cost-effectiveness of culturally tailored interventions. The median cost per quality-adjusted life year gained was \$17,670 for cardiovascular disease prevention through community health worker interventions, well below the conservative \$50,000 benchmark [10]. A systematic review of 50 cost-effectiveness studies found that 70% of community health worker interventions were cost-effective, with interventions in cardiovascular disease and diabetes management showing particularly strong value [11]. Modeling studies demonstrate that CHW-led hypertension screening and treatment achieves incremental cost-effectiveness ratios of \$69-\$389 per DALY averted across diverse African settings [12].

These interventions are not merely cost-effective—they represent essential infrastructure for achieving population-level cardiovascular health equity. Disparate cardiovascular care results in worse cardiovascular outcomes, especially for groups who have the highest burden of cardiovascular disease, making culturally competent care both a clinical necessity and an ethical imperative [5,8].

Health System Redesign for Equity

Integrating Community Health Workers as Essential Team Members

Community health workers represent a critical bridge between healthcare systems and communities experiencing health inequities, yet their integration into care teams remains inconsistent [13]. Fully leveraging CHWs as team members better supports and motivates patients to participate in their own care to improve self-management and medication adherence behaviors, with enhanced

coordination and communication shown to improve blood pressure control, especially within Black, Hispanic, and Latino populations [13].

Successful integration requires multidisciplinary teams where the patient is an active member, fostering shared responsibility and empowering patients to lead their care [13]. Core team members should include primary care clinicians, nurses, dietitians, pharmacists, case managers, social workers, and CHWs, with teams providing patient follow-up, medication management, adherence support, and education on resources [13]. System infrastructure and centralized resources for decision support are effective in supporting CHW home visits to improve blood pressure control, with linkages between system supports and community resources identified as key to sustaining large-scale models [14].

Expanding Reimbursement for Culturally Tailored Team-Based Care

Financial sustainability represents the most significant barrier to scaling culturally tailored interventions. While at least 21 states authorize Medicaid payment for CHW services, actual reimbursement uptake remains limited due to operational barriers at multiple levels, including clarifying regulations, navigating billing complexity, and building organizational capacity [15,16]. Analysis of Louisiana's Medicaid CHW reimbursement program revealed that only 10,726 unique individuals received reimbursed CHW services over two years, with total reimbursement of \$314,905.52, suggesting providers need education about CHW roles and technical assistance for integration and billing [17].

Financial sustainability analyses indicate that minimum fee-for-service rates for 30-minute CHW visits should average \$53.24 nationwide (range \$40.44-\$70.89), with minimum capitated rates of \$140.18 per member per month—rates higher than currently used in many states [18]. One successful model demonstrated that embedding CHWs into clinical settings to screen and address social determinants of health could be sustained and scaled throughout New Mexico's Medicaid system by incorporating costs into capitated payments to managed care and using contract-based hiring [19].

Payment structures must recognize the value of culturally tailored interventions delivered by diverse team members, including pharmacists conducting medication titration, dietitians providing culturally adapted nutritional counseling, and CHWs addressing social determinants of health [20]. Performance reporting and payment systems should be intentionally designed to support and incentivize care delivery systems that advance cardiovascular health equity, including publicly reporting metrics that measure cardiovascular disparities and rewarding reductions in disparities [21].

Embedding Cultural Competence and Social Determinant Assessment

Standardized tools that assess social determinants of health should be incorporated into electronic health records, with clinicians working with multidisciplinary teams to ensure barriers to optimal cardiovascular care are removed [5]. Routine SDOH screening in patients with cardiovascular disease should encompass assessment of mental health, psychosocial stressors, health literacy, sociocultural influences (language, religious affiliation), financial strain, transportation, insurance status, barriers to adherence to a heart-healthy diet, and viable options for regular physical activity and social support [22].

However, screening alone is insufficient—health systems must develop locally tailored resource lists and partnerships to address identified needs effectively [8]. Collaborative cardiovascular care teams can provide tangible and practical community-based resources and services to patients based on identified barriers or needs [22]. Operationalization of guidelines on addressing SDOH requires embedding health equity into clinical practice, team-based care, patient education, and shared decision-making tools [22].

Community-Clinical Partnerships as Essential Infrastructure

Community engagement—working collaboratively with groups of people affiliated by geographic proximity, special interest, or similar situations—is essential for reducing and eliminating cardiovascular disease inequities [13]. Effective community-engaged interventions result from years

of relationship building and collaboration, with collaborative, bidirectional exchanges of knowledge essential to sustainability [13].

Moving care to nontraditional treatment locations through trusted community partners represents a powerful strategy for health systems to provide culturally concordant care. Clinical studies demonstrate that hypertension management in barbershops achieves 22 mm Hg systolic blood pressure reduction, while faith-based center interventions achieve 5.8 mm Hg reduction [8]. These interventions leverage community assets and cultural concordance to achieve outcomes that traditional clinical settings often cannot replicate.

Federally qualified health centers represent valuable community resources providing access to care for individuals at lower socioeconomic levels, with opportunities to expand partnerships including transition-of-care clinics, shared training programs, and investment in research infrastructure [13]. Mobile health units for hypertension screening substantially improve access to care, particularly in socially vulnerable communities, though more work is needed to ensure equitable resource allocation [13].

Policy Strategies to Sustain Culturally Tailored Interventions

Medicaid and Insurance Coverage for Culturally Concordant Care

State Medicaid programs must move beyond authorization to active implementation of CHW reimbursement, with technical assistance for providers navigating billing complexity and building organizational capacity [15,16]. CHW certification programs are associated with \$2.42 higher hourly wages, though wage gaps persist between White and non-White workers and between men and women, highlighting the need for equitable compensation structures [23].

Barrier-free coverage for recommended evidence-based therapies should be provided, with incorporation of screening and treatment for cardiovascular risk factors in all primary health care settings for all patients [24]. Insurance coverage must extend to culturally tailored consultations and services such as health education, preconception counseling, weight loss, and nutritional counseling delivered in patients' preferred languages [24].

Funding Community-Based and Faith-Based Programs

Faith-based interventions demonstrate substantial blood pressure reductions when culturally tailored and delivered by trusted community members, yet sustainable funding mechanisms remain underdeveloped [25,26]. The Affordable Care Act's community benefit requirements provide one mechanism for hospitals to invest in community-based cardiovascular health programs, though utilization for this purpose has been inconsistent [8].

Health systems should understand the needs of their community of patients and their barriers to care to develop meaningful social programs [8]. Innovative systems like CommunityRx, an e-prescribing system that connects patients to health-promoting community resources, can reveal specific community needs and guide resource allocation [8].

Language Access and Workforce Diversity as Structural Requirements

Linguistically appropriate and culturally competent care and patient engagement should be incorporated as key components of patient-centered cardiovascular care and clinical decision-making [5]. Multidisciplinary healthcare teams must ensure availability of interpreters or language line services, yet many health systems lack systematic approaches to language access [5]. Policy mandates requiring language-concordant services, coupled with reimbursement for interpretation services, are necessary to ensure equitable care delivery.

A diverse healthcare team that is congruent with the patient population enhances the cultural competency of the healthcare team and the quality of clinical care delivery, in addition to reducing healthcare disparities [5]. Healthcare professionals who are Black, Hispanic/Latino, and American Indian are more likely to practice in under resourced communities, and healthcare workers from rural areas are more likely to practice in rural communities [13].

Strategies to increase workforce diversity include creating programmatic pipelines for recruiting people underrepresented in medicine, recruiting and retaining women of underrepresented races

and ethnicities in cardiovascular research, and ensuring diversity in clinical trial investigators and participants [24]. Healthcare practitioners and staff should undergo cultural competency and implicit bias training to mitigate the impact of unconscious bias and discrimination on providing optimal patient-centered cardiovascular care [5].

Organizational Commitment to Health Equity

Health systems should create C-suite level Chief Equity Officer positions with adequately resourced equity teams, prioritize advancing health equity by incorporating it into organizational mission statements and leadership compensation packages, and ensure every worker knows how to advance health equity in their daily jobs [21]. Clinicians should ensure health equity in cardiovascular care by viewing each patient through an SDOH lens with cultural humility to formulate comprehensive care plans [22].

Advocating to dismantle institutional racism is central to our pursuit for equitable healthcare outcomes. Numerous social determinants of health instrumental to the development of cardiovascular disease are consequences of systemic racism, promoting diversity within medicine and fostering a workforce that more accurately mirrors patient populations of utmost importance [8].

Implementation Science Framework for Scaling Culturally Tailored Interventions

Leveraging implementation science to achieve cardiovascular health equity requires explicit understanding of how social and structural determinants of health contribute to inequities [19]. Implementation science provides a useful lens for understanding and intervening in evidence-to-practice gaps and offers a pathway to achieving population-level cardiovascular health equity, where everyone has the opportunity to achieve their fullest health potential [19].

Cultural adaptation of evidence-based practices is particularly salient to community-based interventions and should be informed by adaptation frameworks to support replicability and widespread implementation [19]. One multisector coalition adapted nutrition and hypertension interventions for Asian American communities by translating health materials into four relevant languages, emphasizing cultural values to frame goals, offering traditional healthy foods during communal meals, and enhancing roles for faith-based organization leadership, using marketing and community-based participatory research to guide the adaptation process [19].

Future CVD prevention guidelines would be bolstered by culturally specific lifestyle recommendations tailored to the cultural norms and expectations that influence behaviors, beliefs, and attitudes about diet, physical activity, and healthy weight [24]. Community-based approaches, faith-based community partnerships, and peer support in encouraging better lifestyles for chronic disease management could play important roles in improving primary prevention of cardiovascular disease [25].

The path forward requires recognizing that culturally tailored interventions are not supplementary programs but essential infrastructure for equitable cardiovascular care. Achieving cardiovascular health equity demands structural investment in health system redesign, sustainable financing mechanisms, workforce diversity, and community partnerships—investments that are both ethically imperative and clinically necessary for improving long-term population health outcomes.

Future Directions: Innovation, Equity, and Intentional Design

The convergence of digital health technologies, artificial intelligence, and community-driven research models offers unprecedented opportunities to advance cardiovascular health equity. However, realizing this potential requires intentional design that centers equity at every stage of development, implementation, and evaluation [27,28].

Digital Health and Culturally Tailored Care

Technology holds promise to improve cardiovascular health and address prevailing health inequities, yet technology-based solutions are not a panacea [28]. Given the ubiquity of smartphones across racial, ethnic, socioeconomic, and geographic populations, health technology can provide strategies to adopt healthful lifestyle behaviors, screen for social needs, and offer self-monitoring and goal setting to promote behavior change [28]. Digital health interventions demonstrate effectiveness

in minority ethnic populations when specific factors are considered, including patients' beliefs, health needs, literacy levels, culture, and social networks [29].

Digital determinants of health (DDoH) are an important addition to the social determinants of health paradigm, operating at individual, interpersonal, community, and societal levels [28]. Culturally humble approaches using involvement of a broad range of participants and stakeholders spark vital insights for content development, implementation, and evaluation [30]. The FAITH! Program exemplifies successful integration of digital health with community-based participatory research, partnering with African-American faith communities to co-create a mobile health intervention targeting cardiovascular risk factors [31].

Artificial Intelligence Bias and Equitable Algorithms

AI models can perform differently across subpopulations, reflecting societal and statistical bias that may exacerbate cardiovascular health disparities [32]. Six principles should guide equitable AI algorithm design: (1) equity criteria should be chosen relative to the clinical decision being made; (2) algorithm development should occur on diverse datasets representing the target population; (3) inclusion of demographically sensitive features warrants careful consideration; (4) choice of prediction targets requires attention to imperfect proxies; (5) uninterpretable algorithms should be used with caution; and (6) clinical algorithms should complement rather than replace clinician judgment [27].

To mitigate societal bias, individuals from underrepresented populations must be incorporated into the AI/ML model building process with community-based participatory frameworks on more diverse research teams [32]. Regulatory bodies including the WHO, FDA, and American Medical Informatics Association have called for robust inclusion of ethical principles emphasizing inclusiveness and equity in deployment strategies [27].

Community-Driven Research and Precision Public Health

Community-based participatory research offers a transformative approach by centering affected communities in all aspects of research and implementation [13,14]. Implementation science provides a useful lens for understanding evidence-to-practice gaps and offers a pathway to achieving population-level cardiovascular health equity [14]. However, precision public health must focus on addressing social and structural drivers of health and prominently incorporate equity-related concerns, particularly with respect to race and ethnicity, to avoid exacerbating disparities through biased data inputs [33].

Cardiovascular Equity Through Intentional Design

The evidence synthesized throughout this review demonstrates that cardiovascular health equity is achievable—but only through intentional design that embeds equity considerations at every level of intervention development, health system transformation, and policy reform. Culturally tailored interventions are not supplementary programs but essential infrastructure for equitable cardiovascular care. Digital health technologies and artificial intelligence offer powerful tools for scaling these interventions, but only when developed with diverse datasets, community participation, and explicit equity criteria.

Addressing cultural determinants of cardiovascular health is both an ethical obligation and a clinically necessary strategy for improving long-term outcomes. Every patient deserves care that respects their cultural context, addresses their social circumstances, and leverages community assets to support sustained behavior change. Cardiovascular equity is not merely aspirational—it is achievable with intentional design.

Conclusion

Hypertension and heart failure remain dominant drivers of preventable cardiovascular morbidity and mortality, yet their burden is distributed inequitably across the United States and globally. The evidence synthesized in this review demonstrates that disparities in prevalence, disease severity, hospitalization, and mortality among Black patients, many Hispanic and immigrant communities, and other underrepresented populations are not adequately explained by biology

alone, but instead reflect the cumulative impact of cultural determinants and structural inequities that shape risk exposure, access to timely care, and long-term treatment engagement [1–4]. Social determinants—including income, education, neighborhood conditions, and healthcare infrastructure—account for a substantial proportion of observed differences in hypertension control, while barriers such as unstable housing, food insecurity, transportation limitations, limited caregiver support, and language discordance compound disease severity and impede adherence across the cardiovascular continuum [2–6].

Importantly, the growing evidence base shows that culturally tailored interventions can narrow these gaps when they are designed to align with community context, delivered through trusted messengers, and integrated into routine care systems. Community health workers, faith-based partnerships, team-based models that incorporate pharmacists and nurses, linguistically concordant education, and culturally adapted dietary approaches demonstrate meaningful improvements in blood pressure control and cardiovascular risk reduction, particularly in populations historically excluded from traditional healthcare settings. These strategies work not because they are ancillary, but because they address the real-world drivers of outcomes—trust, health literacy, competing social needs, and the feasibility of behavior change—while strengthening continuity of care and patient self-management [1–3,7,8].

Achieving cardiovascular health equity therefore requires a shift from viewing culturally tailored programs as optional add-ons to treating them as core clinical infrastructure. Health systems and policymakers must prioritize sustainable financing mechanisms, expand reimbursement for community-embedded and multidisciplinary services (including CHWs and interpretation), embed standardized social needs assessment with actionable referral pathways, and build durable community–clinical partnerships that move care into accessible, culturally concordant spaces [1,2,7–16]. At the same time, workforce diversification, implicit bias mitigation, and equity-centered performance metrics are essential to ensuring that advances in guideline-directed therapy translate into equitable delivery and outcomes [15–18]. Finally, emerging innovations in digital health and artificial intelligence offer opportunities to scale culturally tailored care, but only if equity is intentionally built into design, datasets, implementation, and evaluation to avoid reproducing existing disparities [1,2,6–9].

In sum, cardiovascular equity is achievable: the field has identified both the mechanisms driving disparities and the interventions capable of reducing them. The path forward demands coordinated structural investment, community partnership, and intentional design so that every patient—regardless of race, ethnicity, language, immigration history, or socioeconomic position—can access effective, culturally responsive cardiovascular prevention and chronic disease management [1,2].

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References

1. Chaturvedi, A., Zhu, A., Gadela, N. V., Prabhakaran, D., & Jafar, T. H. (2024). Social determinants of health and disparities in hypertension and cardiovascular diseases. *Hypertension*.
2. Metlock, F. E., Hinnah, T., Benjasirisan, C., et al. (2024). Impact of social determinants of health on hypertension outcomes: A systematic review. *Hypertension*.
3. Heidenreich, P. A., Bozkurt, B., Aguilar, D., et al. (2022). 2022 AHA/ACC/HFSA guideline for the management of heart failure: A report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *Journal of the American College of Cardiology*.
4. Ogunniyi, M. O., Commodore-Mensah, Y., & Ferdinand, K. C. (2021). Race, ethnicity, hypertension, and heart disease: JACC focus seminar 1/9. *Journal of the American College of Cardiology*.
5. Goldfarb, M. J., Saylor, M. A., Bozkurt, B., et al. (2024). Patient-centered adult cardiovascular care: A scientific statement from the American Heart Association. *Circulation*.
6. Akinyelure, O. P., Jaeger, B. C., Oparil, S., et al. (2023). Social determinants of health and uncontrolled blood pressure in a national cohort of Black and White US adults: The REGARDS study. *Hypertension*.
7. Piña, I. L., Jimenez, S., Lewis, E. F., et al. (2021). Race and ethnicity in heart failure: JACC focus seminar 8/9. *Journal of the American College of Cardiology*.
8. Brandt, E. J., Tobb, K., Cambron, J. C., et al. (2023). Assessing and addressing social determinants of cardiovascular health: JACC state-of-the-art review. *Journal of the American College of Cardiology*.
9. Vafaei, P., Liu, C. M., Davis, H., et al. (2023). Heart health for South Asians: Improved cardiovascular risk factors with a culturally tailored health education program. *BMC Public Health*.
10. Jacob, V., Chattopadhyay, S. K., Hopkins, D. P., et al. (2019). Economics of community health workers for chronic disease: Findings from Community Guide systematic reviews. *American Journal of Preventive Medicine*.
11. Van Iseghem, T., Vroonen, L., Op de Beeck, E., et al. (2025). The cost-effectiveness of community health workers in primary health care: A systematic review. *Value in Health*.
12. Hickey, M. D., Ayieko, J., Kabami, J., et al. (2024). Cost-effectiveness of leveraging existing HIV primary health systems and community health workers for hypertension screening and treatment in Africa: An individual-based modeling study. *PLoS Medicine*.
13. Agarwala, A., Patel, J., Stephens, J., et al. (2023). Implementation of prevention science to eliminate health care inequities in achieving cardiovascular health: A scientific statement from the American Heart Association. *Circulation*.
14. Rossi, L. P., Granger, B. B., Bruckel, J. T., et al. (2023). Person-centered models for cardiovascular care: A review of the evidence: A scientific statement from the American Heart Association. *Circulation*.
15. Gunter, K. E., Ellingson, M. K., Nieto, M., Jankowski, R., & Tanumihardjo, J. P. (2023). Barriers and strategies to operationalize Medicaid reimbursement for CHW services in the state of Minnesota: A case study. *Journal of General Internal Medicine*.
16. Coker, T. R., Liljenquist, K., Lowry, S. J., et al. (2023). Community health workers in early childhood well-child care for Medicaid-insured children: A randomized clinical trial. *JAMA*.
17. Wennerstrom, A., Adkins, C., Witmeier, K., et al. (2025). Uptake of Medicaid billing for community health worker services in Louisiana, 2022–2023. *Medical Care*.
18. Basu, S., Patel, S. Y., Robinson, K., & Baum, A. (2024). Financing thresholds for sustainability of community health worker programs for patients receiving Medicaid across the United States. *Journal of Community Health*.
19. Moise, N., Cené, C. W., Tabak, R. G., et al. (2022). Leveraging implementation science for cardiovascular health equity: A scientific statement from the American Heart Association. *Circulation*.
20. Abdalla, M., Bolen, S. D., Brettler, J., et al. (2023). Implementation strategies to improve blood pressure control in the United States: A scientific statement from the American Heart Association and American Medical Association. *Hypertension*.
21. Schneider, E. C., Chin, M. H., Graham, G. N., et al. (2021). Increasing equity while improving the quality of care: JACC focus seminar 9/9. *Journal of the American College of Cardiology*.

22. Virani, S. S., Newby, L. K., Arnold, S. V., et al. (2023). 2023 AHA/ACC/ACCP/ASPC/NLA/PCNA guideline for the management of patients with chronic coronary disease: A report of the American Heart Association/American College of Cardiology joint committee on clinical practice guidelines. *Journal of the American College of Cardiology*.
23. Jones, T. M., Jeung, C., Schulte, A., Lewis, C. M., & Maddox, P. J. (2022). Hourly wages and turnover of community health workers according to US state certification policy and Medicaid reimbursement, 2010–2021. *American Journal of Public Health*.
24. Mehta, L. S., Velarde, G. P., Lewey, J., et al. (2023). Cardiovascular disease risk factors in women: The impact of race and ethnicity: A scientific statement from the American Heart Association. *Circulation*.
25. Ogunniyi, M. O., Commodore-Mensah, Y., & Ferdinand, K. C. (2021). Race, ethnicity, hypertension, and heart disease: JACC focus seminar 1/9. *Journal of the American College of Cardiology*.
26. Lynch, E. B., Tangney, C., Ruppert, T., et al. (2024). Heart 2 heart: Pilot study of a church-based community health worker intervention for African Americans with hypertension. *Prevention Science*.
27. Jain, S. S., Elias, P., Poterucha, T., et al. (2024). Artificial intelligence in cardiovascular care—Part 2: Applications: JACC review topic of the week. *Journal of the American College of Cardiology*.
28. Powell-Wiley, T. M., Brewer, L. C., Burke, L. E., et al. (2025). Role of technology in promoting heart-healthy behavior change to increase equity in optimal cardiovascular health: A scientific statement from the American Heart Association. *Circulation*.
29. Goswami, A., Poole, L., Thorlu-Bangura, Z., et al. (2023). The use of digital health interventions for cardiometabolic diseases among South Asian and Black minority ethnic groups: Realist review. *Journal of Medical Internet Research*.
30. Naderbagi, A., Loblay, V., Zahed, I. U. M., et al. (2024). Cultural and contextual adaptation of digital health interventions: Narrative review. *Journal of Medical Internet Research*.
31. Brewer, L. C., Hayes, S. N., Caron, A. R., et al. (2019). Promoting cardiovascular health and wellness among African Americans: Community participatory approach to design an innovative mobile-health intervention. *PLOS ONE*.
32. Armondas, A. A., Narayan, S. M., Arnett, D. K., et al. (2024). Use of artificial intelligence in improving outcomes in heart disease: A scientific statement from the American Heart Association. *Circulation*.
33. Allen, C. G., Olstad, D. L., Kahkoska, A. R., et al. (2023). Extending an antiracism lens to the implementation of precision public health interventions. *American Journal of Public Health*.

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