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Social Determinants of Hypertension: A Focus on Low- and Middle-Income Countries

Determinantes sociales de la hipertensión: un enfoque en los países de ingresos bajos y medios

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Abstract

Hypertension (HTN), a global health crisis, is profoundly influenced by social determinants of health (SDOH). This paper investigates the intricate relationship between SDOH and HTN, examining key factors that contribute to its prevalence. We identified the most relevant studies on the association between SDOH and HTN. The findings underscore the importance of addressing SDOH to effectively manage HTN. Interventions targeting education, income inequality, and access to healthcare are essential for reducing the burden of HTN. Future research should focus on developing and evaluating comprehensive interventions that address multiple SDOH simultaneously.

Keywords: Hypertension, social determinants of health, socioeconomic factors, cardiovascular diseases.

Resumen

La hipertensión (HTA), una crisis sanitaria mundial, está profundamente influenciada por determinantes sociales de la salud (DSS). Este artículo investiga la compleja relación entre los DSS y la HTA, analizando los factores clave que contribuyen a su prevalencia. Se identificaron los estudios más relevantes sobre esta la asociación. Los hallazgos subrayan la importancia de abordar los DSS para gestionarla eficazmente. Las intervenciones dirigidas a la educación, la desigualdad de ingresos y el acceso a la atención médica son esenciales para reducir su carga. Las investigaciones futuras deberán centrarse en desarrollar y evaluar intervenciones integrales que aborden múltiples DSS simultáneamente.

Palabras clave: Hipertensión, determinantes sociales de la salud, factores socioeconómicos, enfermedades cardiovasculares.

Introduction

Hypertension (HTN) is recognized as a leading preventable risk factor (RF) for global mortality, contributing to over 10 million deaths annually. The burden of HTN disproportionately affects populations in low- and middle-income countries (LMICs), where high rates of uncontrolled HTN significantly contribute to cardiovascular disease (CVD) mortality. In contrast, high-income countries (HICs) have demonstrated better blood pressure (BP) control, largely due to advancements in healthcare systems and public health initiatives.[1] However, despite these improvements, substantial disparities persist, particularly among rural residents, ethnic minorities, and low-income populations within HICs.[2]

Over the past three decades, mortality from HTN-related CVDs has continued to rise in LMICs. This alarming trend has been attributed to factors such as urbanisation, dietary shifts, and insufficient healthcare resources. Socioeconomic status (SES) has emerged as a key determinant of BP disparities, with individuals of lower SES experiencing higher rates of HTN prevalence.[3] While the global relationship between SES and HTN outcomes is well-documented, effective mitigation strategies require region-specific interventions tailored to local contexts.[4]

Social determinants of health (SDOH) play a critical role in influencing HTN outcomes. The World Health Organization (WHO) identifies SDOH as encompassing housing, income, education, and neighbourhood environments. Addressing these factors has shown significant potential in reducing BP disparities.[5] For example, neighbourhood characteristics such as walkability, access to healthy foods, safety, and social cohesion have been associated with better HTN control.[6] Conversely, high levels of neighbourhood deprivation, including poverty and racial segregation, correlate with poorer BP outcomes.[7]

Economic stability also influences HTN outcomes. Lower household income and employment instability are linked to higher HTN prevalence and reduced BP control, especially in communities with limited access to affordable healthcare and insurance coverage.[8,9] Furthermore, housing conditions, such as residential density and living space, contribute to HTN risk, highlighting the importance of adequate urban planning and housing policies.[10]

Educational attainment and health literacy are equally critical in HTN management. Higher education levels are associated with improved treatment adherence and awareness of HTN risks, whereas limited educational opportunities can hinder access to healthcare resources and understanding of medical advice.[11] Emerging digital health interventions, such as smartphone-based self-management programs, also present opportunities to address disparities in HTN care. These technologies can deliver scalable, tailored solutions to underserved populations.[12]

Despite these advancements, less than 50% of individuals globally achieve optimal BP control. Addressing the interplay of SES and SDOH in public health policies remains critical to bridging these gaps. Emphasizing preventive strategies such as lifestyle interventions, accessible medications, and community-based programs will be essential in achieving equitable health outcomes, particularly in LMICs and underserved populations in HICs.[13] Tailored interventions that address SDOH are crucial to combating the global HTN epidemic.[8]

In conclusion, understanding and addressing the complex interplay of SDOH and SES is essential to reducing global HTN disparities. By implementing tailored, context-specific interventions and integrating preventive strategies into public health frameworks, it is possible to bridge these gaps and achieve equitable HTN management outcomes across diverse populations. This approach will not only mitigate the global burden of HTN but also contribute to the broader goal of improving cardiovascular health worldwide.

Methodology

This article review evaluated the SDOH and possible propositions for HTN prevention. It was restricted to studies published between 1999 and 2024. The article examined the impact of SES on prevalence/incidence of HTN. We included the keywords "social determinant", "socioeconomic factors", "hypertension" and "high blood pressure" in the title/abstract search. The articles were thoroughly screened and verified to best match our findings. Irrelevant reports were excluded. The inclusion criteria encompassed articles published in English and studies conducted across countries of all income levels. To have a full picture of possible factors that influence HTN incidence, we needed to evaluate the findings of the countries with a higher income per capita too. Unfortunately, there is a scarcity of research that examines the SDOH in HICs.

We chained our attention specifically to such factors as education, income and occupation as they are known to have the strongest impact on CVD incidence.[5] Other important determinants such as potential stressors, both throughout and in periconceptual life, social isolation, loneliness and the presence of support obtained by society were also examined (Figure 1).

Figure1 Social determinants of HTN

SES and HTN

The positive associations between socioeconomic status (SES) and cardiovascular risk factors (RFs) were predominantly observed for obesity (91%), diabetes (88%), adverse lipid profiles (69%), HTN (66%), and physical inactivity (83%). These RFs are closely linked to lower SES populations facing limited healthcare access and preventive measures.[8] Addressing social determinants of health can reduce the burden of HTN and related metabolic diseases like type 2 diabetes and dyslipidaemia.[14]

Lower SES individuals often experience clustered RFs due to barriers in preventive care and healthy behaviours.[15] Understanding SES's role in CVD and its contributing factors is essential for developing targeted strategies to address health disparities. SES is a multidimensional construct encompassing financial resources and education levels. Lower education consistently correlates with poorer RF profiles, including higher smoking, physical inactivity, and obesity rates, especially among women and ethnic minorities.[16] To minimise the burden of high BP prevalence, every step of the HTN management cascade should be followed: monitoring of incidence rate, screening (to promote awareness), treatment and regular control through accessible and community-driven healthcare initiatives, particularly in underserved regions[17,18,19].

Education and HTN

The lower the educational attainment of a population, the higher the risk of HTN incidence. This is a relatively consistent association based on verified sources [20]. Education, a key component of SES, consistently correlates with better cardiovascular health. Lower educational attainment (EA) is strongly linked to higher HTN prevalence, as shown in studies from Spain, Portugal, and multi-ethnic populations, often due to central obesity, physical inactivity, and limited access to medical care.[21,22,23] International studies, such as INTERHEART and PURE, highlight low EA as a significant risk factor for acute myocardial infarction and CVD, particularly in LMICs.[24,25] The CONSTANCES cohort in France confirms an educational gradient in HTN prevalence, driven by behavioural and socioeconomic factors.[26]

Health literacy plays a critical role in disease management by improving treatment adherence and chronic disease control.[27] Enhancing education and healthcare access, particularly in underserved regions, can reduce HTN and its associated costs.

Evidence on whether higher EA improves treatment outcomes is inconsistent. Studies in Singapore and South Korea reported better outcomes with higher EA, whereas studies in Switzerland, Australia, and Japan found less effectiveness, potentially due to cultural or healthcare system differences or noncompliance in highly educated populations,[20,23,28,29,30] which may influence patient adherence and access to services.[31] In some settings, highly educated individuals may disregard doctors' recommendations, leading to poorer outcomes.

Access to education strongly influences employment and economic stability.[32] A nationwide study in China found lower educational attainment (EA) linked to higher HTN risk and poorer treatment outcomes, highlighting the combined impact of education and economic conditions on health.[33] Addressing HTN requires a multidimensional program to improve both educational and economic conditions.

Income and HTN

Lower income limits financial options, causing distress and unhealthy choices like poor diet and substance use.[34] A U.S. study found lower-income groups had higher obesity, diabetes, and HTN rates, with physical inactivity rising 71.1% in the lowest-income group over a decade.[35] South Korean research showed low-income individuals with uncontrolled BP face greater cardiovascular mortality risks, emphasizing income's role in HTN outcomes.[36] However, high income linked to long work hours also contributes to chronic stress, a key factor in HTN.[37]

Income's association with HTN is inconsistent. While some studies find no link, a recent AHA report identifies income as one of three major social factors influencing cardiometabolic health [5,38]. In rural India, higher income weakly correlated with HTN due to dietary habits and sedentary lifestyles.[39] A Korean study showed low income and poor medication adherence significantly increased mortality, emphasizing financial constraints' impact on health.[40]

Occupation and HTN

Occupation plays a significant role in determining an individual's risk of developing HTN. Several factors related to work can contribute to this increased risk, including occupational stressors, SEFs and physical demands.[41] High-stress jobs, especially those with high demands and low decision-making control, are strongly linked to increased HTN prevalence. The job strain model highlights this interaction, with women in low-status occupations being particularly vulnerable, in comparison to men.[42,43]

In HICs, higher employment rates correlate with lower HTN prevalence, partly due to increased income, job-related physical activity, and better healthcare access, which vary by occupation.[44] Occupational noise exposure is another significant risk factor; a 2022 systematic review found a threefold higher HTN risk in noise-exposed workers compared to those with low exposure.[45,46] Additionally, prolonged work hours and skill underutilisation further elevate HTN risk, demonstrating the multifactorial nature of occupational stress.[47]

These findings highlight the importance of improving working conditions broadly, not only through stress management programs and ergonomic workplace practices, but also by addressing issues such as excessive working hours, gender inequality, income disparities, and limited autonomy in task organization. Several studies point to income level, gender dynamics, and lack of free time for physical activity as key contributors to HTN risk, reinforcing the need for holistic workplace reform. As such, HTN could be considered an occupational disease, and addressing its drivers requires a comprehensive approach to occupational health and well-being.[48,49,50,51] Furthermore, recent literature emphasizes the critical role of occupational environments in cardiovascular health, citing poor ergonomics, prolonged working hours, limited task autonomy, lower income, and a secondary lack of leisure time for physical activity as distinct risk factors for the development of HTN.

Stress and HTN

Elevated stress increases sympathetic activity, inflammatory markers, and HTN and CVD risks, with potential epigenetic effects.[52] Chronic stress from psychological, social, or environmental factors leads to low-grade inflammation, contributing to non-communicable diseases.[53] Urbanisation, sedentary lifestyles, and environmental stressors like noise and air pollution worsen oxidative stress and autonomic dysfunction, raising HTN risk.[54,55] Workers in LMICs face added risks, highlighting the need for healthy workplaces and stress management programs, which effectively reduce cardiovascular risk factors like BP and cholesterol.[56,57] Those at the bottom of the social pyramid are more vulnerable to stress due to future uncertainty. Chronic psychological stress triggers the overload of the hypothalamic-pituitary-adrenal (HPA) axis and the sympathetic-adrenomedullary (SAM) axis, resulting in the secretion of stress hormones like corticosteroids and catecholamines. This triggers pro-inflammatory cells, acute phase proteins, cytokines, and oxidative stress. The resulting inflammation and endothelial dysfunction play a key role in HTN.[58] Solutions include yoga, meditation, physical activity, and Cognitive Behavioural Therapy to lower stress markers and improve health, though accessibility barriers persist, particularly in LMICs.[59,60,61]

Obesity and HTN

Excess weight, especially visceral adiposity, significantly contributes to HTN, accounting for 65–75% of primary HTN risk. Obesity-related mechanisms include sympathetic nervous system and renin-angiotensin-aldosterone system overactivation, adipose-derived cytokine dysregulation, insulin resistance, and renal alterations.[62,63] Visceral fat promotes chronic inflammation, insulin resistance, and pro-inflammatory cytokine release, increasing cardiovascular risks.[64] Maintaining a Body Mass Index (BMI) below 25 kg/m² prevents HTN, while weight reduction lowers BP in most hypertensive individuals.[65,66] Obesity patterns vary by SES. In HICs, male obesity is consistent across income levels, while female obesity increases as income decreases.[67,68] Visceral obesity is a stronger HTN predictor than general obesity due to its metabolic effects on vascular and renal systems.[69]

In low-income countries, SES positively correlates with obesity for both genders, driven by urbanisation and sedentary lifestyles, with 70% of obese individuals globally in LMICs.[70,71,72] In middle-income countries, the association is mixed for men and negative for women.[72] Visceral fat plays a dominant role in metabolic risks, even where general obesity prevalence is low.[73] Among children, obesity is more common in boys and increases with income, correlating positively with SES for both genders.

In low income countries, lower BMI reflects resource scarcity, stress, and nutrient deficiencies, while in HICs, calorie-dense diets and sedentary lifestyles elevate obesity-related HTN risks[74]. These factors highlight the multifaceted relationship between SES, obesity, and HTN. Despite SES variations, visceral fat remains the primary driver of HTN, underscoring the complex relationship between SES, obesity, and HTN.[75]

Social isolation/loneliness and HTN

Social isolation and limited social networks negatively affect health behaviours, such as physical activity, smoking, and medication adherence, increasing CVD risks.[76,77] Studies link social isolation and loneliness to higher blood pressure and HTN, while greater social contact among Black individuals reduces treatment-resistant HTN prevalence by 13%.[78,79] Strong social connections lower inflammatory markers like C-reactive protein, reducing CVD risk.[80] Longitudinal U.S. studies show social integration cuts the risk of metabolic disorders like HTN and obesity by nearly 50%, with European studies highlighting its role in lowering all-cause mortality, comparable to smoking or obesity.[81] Chronic isolation worsens autonomic dysregulation, HPA axis activation, and oxidative stress, raising CVD risks.[82] Older adults benefit from social interaction, improving medication adherence and healthcare engagement.[83,84,85] Nearly one-third of adults over 45 and one-quarter over 65 experience loneliness or isolation.[86] Community and technology-based interventions, such as digital platforms, can mitigate social isolation's health impacts.[87]

Race/ethnicity and HTN

Studies show that Black adults, especially women, tend to get HTN much earlier than their white peers [88]. By age 55, 75% of Black adults have the disease, compared to 50% of white men and 40% of white women. The heightened prevalence of HTN among Black individuals has been linked to a combination of biological, social, and environmental factors, which together exacerbate cardiovascular risks.[89] A study of 357 Black and Latino participants assessed lifetime exposure to racial discrimination, with ambulatory BP monitors collecting data overnight.[90] Results showed a correlation between racism experiences and elevated nighttime BP levels, reflecting chronic stress from systemic racism.[91]

Multigenerational racism and neighbourhood segregation heighten cardiovascular risks by causing chronic stress, economic disadvantage, and limited access to health-promoting resources [92]. Social exclusion and stigmatisation also make it challenging for marginalized individuals to maintain a healthy lifestyle.

Bias among clinicians, including stereotypes, leads to delayed care and less treatment intensification for Black patients, worsening disparities.[93,94,95,96] Black patients with HTN receive less aggressive and delayed care versus white patients, exacerbating health disparities.[97] While evidence of bias remains difficult to prove, findings from Schulman and Green underscore its existence and significance.[98,99] Residential segregation links to higher HTN prevalence via less access to healthy resources and increased stress.[100] Healthcare practitioners must challenge biases and ensure equitable care for all.

Neighbourhood, built environment and HTN

Neighbourhood environments, including air quality, walkability, and green space, greatly affects health. Poor neighbourhoods have worse air quality and less green space, increasing HTN risks linked to structural racism and socioeconomic inequalities.[101,102,103] Higher education and income levels reduce HTN risks, even in deprived areas, while prolonged exposure to pollutants like to particulate matter (PM2.5) and nitrogen dioxide (NO_2), especially in LMICs, increases HTN prevalence.[104] Accordingly, the provision of quality education and well-compensated employment opportunities would have a beneficial impact on the health status of vulnerable populations. Compared to North America and Europe, urban air pollution in LMICs is 17 times higher.[105] This disparity highlights the urgent need for air quality management in LMICs, as prolonged exposure to PM2.5 and NO_2 significantly increases HTN prevalence.[106]

More physical activity lowers HTN risk, even counteracting negative neighbourhood effects in poorer areas.[107] Better neighbourhood walkability increases physical activity and reduces HTN prevalence, even in urban areas with high air pollution.[108] Access to safe green spaces further reduces HTN incidence by promoting activity, improving mental health, and minimizing exposure to air pollution, heat, and noise, while fostering social interactions.[109,110] For instance, a Taiwan study found a 24% lower HTN risk in greener neighbourhoods due to improved BMI and reduced pollution.[111]

Food insecurity and HTN

Food insecurity (FIS), characterized by limited or uncertain access to sufficient food, represents a critical public health challenge associated with increased cardiovascular risk. It stems from factors like poverty and disability, alongside systemic barriers such as inadequate transportation and limited access to grocery stores. FIS disproportionately affects low-income populations, exacerbating existing health inequities and contributing to diet-sensitive chronic diseases such as HTN, diabetes, and hyperlipidemia.[112] As a significant SDOH, FIS has profound implications for public health, contributing to disparities in health outcomes.[113] Targeted public health interventions are crucial to address food insecurity's impact on diet and prevent/manage HTN, especially in Black, Hispanic, and low-income groups, with

LMICs significantly more affected (57% vs. 11% in HICs).[114,115,116]

FIS itself shows detrimental effects on HTN incidence but combined with other RFs such as obesity, unhealthy diet and physical inactivity, becomes a factor with even more harmful influence. Food-insecure individuals often consume high-calorie, nutrient-poor foods due to cost, increasing risks of HTN and metabolic syndrome.[117] It has been correlated not only with sleep duration, quality and disturbance among older adults but also to depression and poor mental health that can worsen the physical health conditions.[118] FIS is also closely associated with chronic stress, which triggers the hypothalamic-pituitary-adrenal axis, contributing to inflammatory pathways that increase HTN risk.[119]

Young adults facing FIS are more likely to be diagnosed with HTN compared to their food-secure peers.[120] FIS indirectly raises BP via unhealthy diets and inactivity, worsening cardiovascular risks.[121] Additionally, FIS-related stress from resource insecurity further elevates the risk of developing cardiovascular conditions.[122]

Sleep deprivation and HTN

Sleep plays a crucial role in regulating autonomic nervous system activity and other physiological processes that influence BP. Sleep disruptions, particularly disorders, impair BP regulation and increase HTN risk.[123] A reduction of less than 10% in nighttime BP, known as non-dipping, is a significant independent predictor of CV risk. Individuals with diminished dipping have a twofold increased CV event risk compared to those with normal patterns.[124]
The Ohasama study showed that every 5% reduction in expected nocturnal BP decline increases cardiovascular (CV) mortality risk by approximately 20%.[125] Conditions such as chronic kidney disease, diabetes, older age, resistant HTN, and obstructive sleep apnea (OSA) are associated with non-dipping. OSA patients show higher nocturnal non-dipping prevalence, exacerbating HTN via sympathetic activation and oxidative stress.[126] Research highlights that nighttime BP is a better CV risk predictor than daytime BP.

Over five decades, average sleep duration has declined by 1.5–2 hours per night, with over 30% of Americans reporting less than 6 hours of sleep.[127] Short sleep duration elevates stress hormones like cortisol and inflammatory markers, contributing to higher BP and CV risks.[128] Night and early shifts disrupt sleep patterns, promoting cardiometabolic stress, immune dysfunction, cognitive impairments, and behaviours like reduced physical activity, smoking, or alcohol use.[129]

Short sleep also promotes salt appetite and suppresses renal salt excretion, with sleep deprivation linked to altered hormones like reduced leptin and elevated ghrelin, driving weight gain.[130] In an LMIC study, poor sleep quality was significantly associated with HTN.[131] Despite sleep's importance, high-quality data on sleep health in LMICs is limited. More research is needed on how cultural and socioeconomic factors in LMICs affect sleep behaviours and HTN risk.[132]

Access to clean water and HTN

Dehydration initially lowers BP but, when chronic, causes vasoconstriction, increased blood viscosity, and elevated BP. Mild dehydration activates the renin-angiotensin system, raising HTN risks.[133] Healthy individuals tolerate excess fluid, but overhydration can severely affect those with cardiac or renal issues.

The US EPA lists 80 drinking water contaminants, with chronic exposure increasing risks for anaemia, HTN, and cancer.[134] Drinking 6–8 cups of plain water daily may reduce HTN risk, as shown in a Chinese cohort study.[135] A Bangladeshi study found sodium in water raises BP, while potassium, calcium, and magnesium lower it. Adding calcium and magnesium to drinking water is an effective strategy to combat HTN in vulnerable populations.[136,137]

Disadvantaged communities often experience limited access to clean water. In LMICs, only one in three people has safely managed drinking water.[138] Poor water quality, often due to inadequate sanitation and pollution, raises the risk of waterborne diseases and CV issues.[139] Reduced water intake isn't directly tied to high BP, but residents in these areas have higher CVD rates. Good drinking water quality is vital for preventing HTN because contaminants negatively impact overall health.

Housing issues and HTN

Housing significantly impacts CV health. Homeless adults face a 60–70% higher risk of CV events than the general population. Poor living conditions, such as inadequate climate control and exposure to mould, lead, and second-hand smoke, increase CV risk factors. Chronic exposure to indoor pollutants and structural deficiencies is strongly associated with elevated HTN and other CV risks.[140]
Systemic issues like segregation and gentrification limit access to quality housing in marginalised communities, worsening heart health. According to a study by the American Heart Association (AHA), among homeless and housing-insecure individuals, 70–80% smoke, 25% use cocaine, and 25% face mental health challenges, all harming cardiovascular outcomes. Urban slum dwellers in LMICs face added risks from overcrowding, poor ventilation, and limited healthcare access.[141]

A study in Philadelphia found no significant link between housing insecurity and self-reported heart disease but noted a higher risk of HTN among those affected. Improving housing conditions and creating targeted aid for vulnerable populations could reduce HTN rates.[142]

In LMICs, slum dwellers often adopt unhealthy lifestyles, increasing their exposure to HTN RFs.[143]

Access to the healthcare system and HTN

Effective HTN management in LMICs faces a multitude of challenges. Limited access to healthcare creates a barrier to early diagnosis and preventive care, as many individuals lack regular check-ups. Furthermore, inadequate infrastructure in health facilities often means a lack of essential equipment and resources for diagnosis and treatment, leading to delayed or inadequate care. A lack of trained healthcare professionals and essential medications exacerbates the situation, preventing effective HTN control in these regions.[144]

While there is limited research explicitly linking healthcare access to HTN incidence, it is evident that improved access to healthcare practitioners and medical facilities leads to better health outcomes. Strengthening healthcare infrastructure and integrating HTN screening into primary care services are critical steps toward reducing global disparities in HTN management.[145]

Integrating Social Determinants in Hypertension Prevention and Management

Despite significant advances in the clinical management of hypertension, fewer than 50% of affected individuals achieve adequate blood pressure control, even in high-income countries.[146] This persistent gap underscores the inherent limitations of approaches that focus exclusively on clinical care. As this review has demonstrated, socioeconomic inequities, including disparities in education, income, occupation, neighborhood environments, and access to essential resources such as clean water and nutritious food, are fundamental determinants of hypertension and related cardiometabolic conditions.[147,148,149,150] These structural social factors not only contribute to the onset and progression of disease but also perpetuate health disparities across populations.[151] Consequently, clinical interventions, while necessary, are insufficient in isolation. A comprehensive strategy to prevent and mitigate the burden of cardiovascular disease must incorporate the social determinants of health within a broader social medicine framework. Such an approach acknowledges the inextricable link between biological and social processes and calls for systemic, policy-level reforms alongside individual-level clinical management to advance health equity.

Conclusion and Recommendation

Limited access to quality, affordable healthcare delays diagnosis and treatment, worsening vascular disease outcomes, increasing morbidity, and creating financial burdens that disproportionately affect low-income populations, exacerbating socioeconomic disparities.[152,153]
Improving healthcare and reducing CVD, especially HTN, demands time and resources. Key

actions include expanding primary care access in poor areas by building clinics, funding visits, and employing physicians. Standardizing regular check-ups and preventive measures like healthy diets, no tobacco/alcohol, exercise, and consistent sleep are crucial. Medical students and professionals can volunteer for public health education, such as IFMSA initiatives.[154] While medical students and professionals cannot directly influence pharmaceutical manufacturing costs or pricing policies, they can advocate for policy reforms, support the use of generic medications, promote transparent procurement, and collaborate with non-profit manufacturers, actions that help reduce prices within the economic structure of healthcare delivery.

Men are less likely than women to progress through HTN care due to societal norms, healthcare accessibility, and the prioritisation of maternal and child health. Strategies targeting men's involvement in HTN care are essential to prevent widening gender disparities. Individuals with lower SES are also disproportionately lost early in the care cascade, often facing reduced access to quality care and catastrophic healthcare costs. Addressing these inequalities is vital for equitable HTN management.

However, to fully grasp and effectively address the complexity of cardiometabolic health, it is not sufficient to focus solely on individual determinants; it is necessary to understand these conditions from the broader perspective of social determinants, which conceptualize biological processes as inherently shaped by structural social conditions. This approach aligns with the field of social medicine and emphasizes the need for systemic, policy-level changes to reduce health inequities.

While challenging and resource-intensive, every small step toward improving healthcare access and outcomes matters deeply.

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