The growing intersection of obesity and hypertensive heart disease: a call to action

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Hypertensive heart disease (HHD) is one of the most unrecognized but important expressions of the cardiovascular disease continuum [1]. Although coronary artery disease and stroke have tended to dominate the global prevention initiatives, HHD which is characterized by left ventricular hypertrophy, fibrosis, and ultimate heart failure, is one of the main contributors to CVD related morbidity, mortality and economic burden [2]. In this issue, Xu *et al.* provide an important contribution to our understanding of this condition by quantifying the burden of HHD attributable to high body mass index (HBMI) between 1990 and 2021 and projecting trends through 2040 [2]. Their findings underscore a growing crisis at the intersection of obesity and hypertension, two modifiable risk factors that are accelerating the global cardiovascular epidemic.

Rising burden despite modest rate changes

Based on the Global Burden of Disease (GBD) database, the authors show that the global age-standardized mortality rate (ASMR) for HHD due to HBMI rose slightly, from 6.83 to 7.21 per 100,000 between 1990 and 2021, with a respective estimated annual percent change (EAPC) of 0.33. Likewise, the age-standardized DALY rate (ASDR) also increased slightly, from 144.7 to 147.3 per 100,000 over the same interval with an EAPC of 0.15. At first glance, these incremental rate changes in standardized rates might be considered small but looking deeply one can appreciate growing deaths rates and worsening DALYs, suggesting a very strong influences with increasing population growth and aging.

The authors also estimate that although global ASMR and ASDR will likely stabilize or rise only slowly until 2040, the number of HHD deaths and DALYs due to HBMI will still rise. This divergence between relative and absolute burden has important implications: health systems need to prepare for an increasing case load of obesity- and hypertension-related heart disease even without an increase in per-capita risk.

A geography of inequality

Most notably, perhaps, is the heterogeneity by region. Xu *et al*. show that ASMR and ASDR are lowest in high-sociodemographic index (SDI) countries such as those in North America, Europe, and Australia, while the heaviest burdens fall on countries in sub-Saharan Africa and along the Mediterranean coast [1, 2]. In some African nations, the age-stan-

dardized HHD mortality rate attributable to HBMI is nearly tenfold higher than that of high-income regions.

Low- and middle-SDI countries are particularly vulnerable for several reasons. First, rapid urbanization and globalization have driven an epidemiologic shift toward high-calorie diets, physical inactivity, and rising obesity prevalence [3]. Second, the ability for hypertension detection, treatment, and long-term follow-up is still limited in most health systems [4]. Lastly, socioeconomic obstacles, poor health literacy, and restricted access to low-cost medications exacerbate the issue [5]. The authors' cross-country inequality analysis demonstrates that these disparities are expanding over time, raising concerns for global health equity.

Implications for prevention and policy

The results of Xu *et al.* have a number of implications for prevention, policy, and practice. Firstly, while hypertension one of the most manageable cardiovascular risk factors, it is still poorly controlled across most of the globe. Primary care systems need to be strengthened to enhance screening, compliance, and long-term management. Incorporating hypertension care into established maternal, child, and employer health programs can offer cost-effective leverage in resource-poor environments. Second, obesity is a risk factor that can be modified, and weight control is the most obvious chance to reduce future HHD burden [6]. Public health initiatives need efforts to optimize quality of diet, access of healthy nutrition, policies to enhance physical enhancement, as well as access to emerging anti-obesity medications to those at the highest risk.

This is of particular importance as we seek to overcome gaps in the huge burden of HHD in low-SDI nations, where access to these interventions is suboptimal. Global health initiatives must prioritize fair distribution of essential medications, using pooled procurement and generic drug programs to drive costs down. As Xu *et al.* sobering analysis point out, that socioeconomic inequity is a major contributor to the overall HHD burden heterogeneity. Unless systemic efforts are implemented to alleviate poverty, support educational enhancement, and health literacy improvement, we will unlikely realize sustained impact in disadvantaged populations.

Research priorities and future directions

Although this analysis provides key insights, it also presents pressing questions for further deliberations. First, real-time monitoring is required to augment the current modeled GBD estimates. In this regard, we need more regional national registries for HHD, obesity, and hypertension to enable these trends to be tracked more precisely and impact of tailored interventions to be assessed. Second, there is an urgent need to focus on young adults, among whom obesity is increasing most rapidly and where early intervention could realize in lifelong benefits. Third, sex-specific and ethnic variation in susceptibility to HHD due to obesity needs to be investigated further, an area in which existing data is still limited. Lastly, implementation science needs to be harnessed to convert policy suggestions into real-world effect, especially in resource-restrained environments.

Conclusion

Xu *et al.*'s study is a wake-up call for researchers, clinicians, and policy makers. The worldwide burden of hypertensive heart disease due to elevated body mass index is not only substantial but is also expected to increase in the next few decades. Even though age-standardized rates might stabilize, the overall DALY's will continue to rise, driven mainly with rising increase in global burden of obesity. Unless there is concerted action to control the rising tide of obesity and targeted strategies to address and manage hypertension, the HHD epidemic will widen, especially in low- and middle-income nations.

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Conflict of interest

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References

1. Dai H, Bragazzi NL, Younis A, et al. Worldwide trends in prevalence, mortality, and disability-adjusted life years for hypertensive heart disease from 1990 to 2017. Hypertension 2021; 77: 1223-33.
2. Xu Z, Li L, Hu Y, et al. Hypertensive heart disease mortality trends attributable to high body mass index over the period 1990-2021 and projections up to 2040. Arch Med Sci 2025; 21: 1164-76.
3. Li R, Zhang J, Zhang M, et al. Global, regional and national burden and trends of disease attributable to high body mass index in adolescents and young adults from 1990 to 2021. Diabetes Res Clin Pract 2025; 222: 112066.
4. Parati G, Lombardi C, Pengo M, Bilo G, Ochoa JE. Current challenges for hypertension management: from better hypertension diagnosis to improved patients' adherence and blood pressure control. Int J Cardiol 2021; 331: 262-9.

5. Maqsood MH, Nguyen R, Chang R, et al. Unfavorable social determinants of health and mortality risk by cardiovascular disease status: findings from a National Study of United States Adults. Am Heart J 2024; 267: 95-100.
6. Lopez-Jimenez F, Almahmeed W, Bays H, et al. Obesity and cardiovascular disease: mechanistic insights and management strategies. A joint position paper by the World Heart Federation and World Obesity Federation. Eur J Prev Cardiol 2022; 29: 2218-37.