Editorial

Title

Unmasking ethnic inequities in rising blood pressure: insights from the HELIUS Study

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Elevated blood pressure, affecting one in four individually globally, is the most potent modifiable risk factors for cardiovascular disease (CVD) including stroke and ischaemic heart disease (IHD)[1]. Despite a decline in hypertension prevalence in high-income countries such as Canada, US and some European countries, ethnic groups continue to experience a higher prevalence of elevated blood pressure compared to host populations[1 2-5]. While these groups show similar or higher rates of awareness and treatment, their blood pressure control lags behind host

populations[4,5]. Without effective intervention, the prevalence of elevated blood pressure will exacerbate cardiovascular morbidity and mortality among these population. Recent guidelines recommend lower blood pressure threshold and targets, emphasising the importance of regular blood pressure (BP) monitoring for early intervention, to mitigate future cardiovascular risk [6]. However, data regarding ethnic variations in BP levels within high income countries remain scare. Most existing research on ethnic disparities comes from the United States. There is a knowledge gap in European countries with increasingly diverse populations, varied cultural backgrounds, and different healthcare systems,

In this issue, Vriend et al investigated ethnic differences in BP over time using baseline (2011-2015) and follow-up data (2019-2021) from the HELIUS study in Netherlands[7]. HELIUS is a large prospective cohort study designed to assess health and care among individuals aged 18-70 years from the six largest ethnic groups in Amsterdam, including the Dutch host population, African Surinamese, South-Asian Surinamese, Turkish, Moroccan, and Ghanaian descent. The main outcome focused on systolic blood pressure (SBP). Hypertension was defined as the use of antihypertensive medication or elevated BP levels (SBP > 140 mmHg and/or DBP > 90). Of the total 22,162 participants, 10,170 had complete data at both baseline and follow-up, representing a 45.8% response rate.

During a mean follow-up of 6 years, the findings showed that SBPs were approximately 2-3 mmHg higher in Ghanaian (1.78 mmHg), Turkish (1.30 mmHg), and Moroccan (2.06 mmHg) groups, with a more significant increase observed in the younger age group, when compared to the Dutch population (Figure A). In contrast, the Dutch group experienced a small decrease (-0.77 mmHg) at follow-up, while no significant differences were observed for the South Asian

Surinamese (-0.18 mmHg) and African Surinamese (0.74 mmHg) populations. The increase in SBP levels was most pronounced in the 40-60 years age group, with mean SBP levels of 139.4 mmHg observed in Ghanaians compared to 124.9 mmHg in the Dutch population (Figure A).

The ethnic differences in blood pressure levels over time observed in the HELIUS study are comparable to US data from the NHANES between 1999-2002 and 2015-2018 cycles[3]. In this study, the mean SBP among non-Hispanic Black individuals was 6.5 mmHg higher, and both Asian and Hispanic populations had a mean SBP over 3 mmHg higher than non-Hispanic White[3], while non-Hispanic White had a decreased SBP (Figure B). While these increases might seem minor, they are associated significant risk of cardiovascular events[8]. In addition, while diastolic BP (DBP) was not measured in this study, Framingham Heart Study reported that a 2 mm Hg reduction in diastolic blood pressure could be associated with a 17% decrease in the prevalence of hypertension, and a 6% reduction in the risk of IHD[9].

The observed divergent trends in SBP over time between the host population and ethnic groups highlight significant disparities in blood pressure management and cardiovascular risk. This disparity suggests that current interventions may not be adequately reaching or effectively addressing the needs of these ethnic groups. This is particularly important for women in the HELIUS study, as their SBP levels approached or exceeded 140 mmHg, requiring more intensive management. Elevated blood pressure levels have been consistently associated with increased risk of major vascular diseases particularly in the younger age groups[8]. The Systolic Blood Pressure Intervention Trial (SPRINT) trial have demonstrated the benefits of SBP lowering to 120 mmHg in some high-risk groups of patients[10]. SPRINT trial showed a 27% reduction in all-

cause mortality with a SBP goal of <120 versus <140 mm Hg. Consistently, a meta-analysis reported blood pressure lowering treatment significantly reduced the risk of CVD and death[11]. This evidence supporting for lowering SBP to less than 130 mmHg have been reflected in guidelines such as those from the American Heart Association (AHA) which now recommend a BP of 130/80 mmHg as the threshold for hypertension[6,12].

The findings also showed an increase in hypertension prevalence across all groups in the follow-up period when compared with the initial baseline rates. The Dutch population had the lowest increase (3.1%), while the Ghanaian (6.8%) and Moroccan (7.7%) populations experienced the highest increases. The follow-up prevalence rates, ranging from 26% in Dutch to over 55% in Ghanaians, were higher than the national rates. A recent global study analysing long-term hypertension prevalence trends from 1990 to 2019 across 184 countries showed a decline in hypertension prevalence, particularly in high-income countries, including the Netherlands, where the rate fell below 25% by 2019[2].

The discrepancies between these studies may be attributed to varying data sources and methodologies. The global study used population-representative data and hypertension prevalence based on data collected in multiple visits, which could yield lower figures than single-visit data collection[2]. In contrast, the HELIUS study comprised participants from an urban setting, which might not fully represent the national population. BP levels in HELIUS were determined on the average of two measurements during a single visit, potentially overestimating prevalence rates[5,13]. In addition, some of the data may have collected during the COVID-19 pandemic. Blood pressure management often involves regular interaction with healthcare

services, particularly primary care. However, the pandemic has significantly disrupted these services and daily routines, possibly leading to decreased physical activity, unhealthy diet choices and limited healthcare access[14]. These factors could have contributed to the rise in hypertension prevalence observed in the HELIUS study. The ethnic differences in elevated SBP could also be partly explained by changes in BMI overtime. Increased BMI is a significant risk factor for hypertension and prior studies showed high prevalence of obesity among these ethnic groups at baseline[15]. However, it was not clear whether obesity rates increased during the follow up period compared to the baseline, due to the lack of relevant data in this study, limiting further interpretation.

Ethnic groups in high-income countries like the US, UK, and the Netherlands were reported to have higher hypertension prevalence, greater awareness, and increased treatment rates compared to host or White populations[4,5] but lower control rates (Figure C). The gap between high treatment rates and low control rates may reflect inequalities in the treatment pathway. Recent data from the US and UK highlight the importance of treatment intensification in relation to suboptimal BP control outcomes[16,17]. Patient factors, such as missing clinic visits, are also associated with poor BP control[16].

The strength of current study lies in the use of follow- up data from HELIUS to access the changes in blood pressure levels across ethnic groups. While the study's findings provide important insights into the ethnic disparities in BP, potential bias could result from varying response rates across ethnic groups, with significant missing rates during the follow up period, particularly among Turkish, Moroccan and Ghanaian groups.

In conclusion, these findings highlight the importance of vigilant BP monitoring and tailored strategies for managing BP among diverse ethnic groups. Addressing ethnic disparities requires a comprehensive approach that considers the complex interplay of cultural, behaviour and societal differences including health behaviours and treatment pathway. Future research could benefit from linking diverse data sources for a more comprehensive understanding of hypertension burden among ethnic groups across various European nations. This will enable targeted prevention and treatment strategies, promoting health equity and improved outcomes for all.

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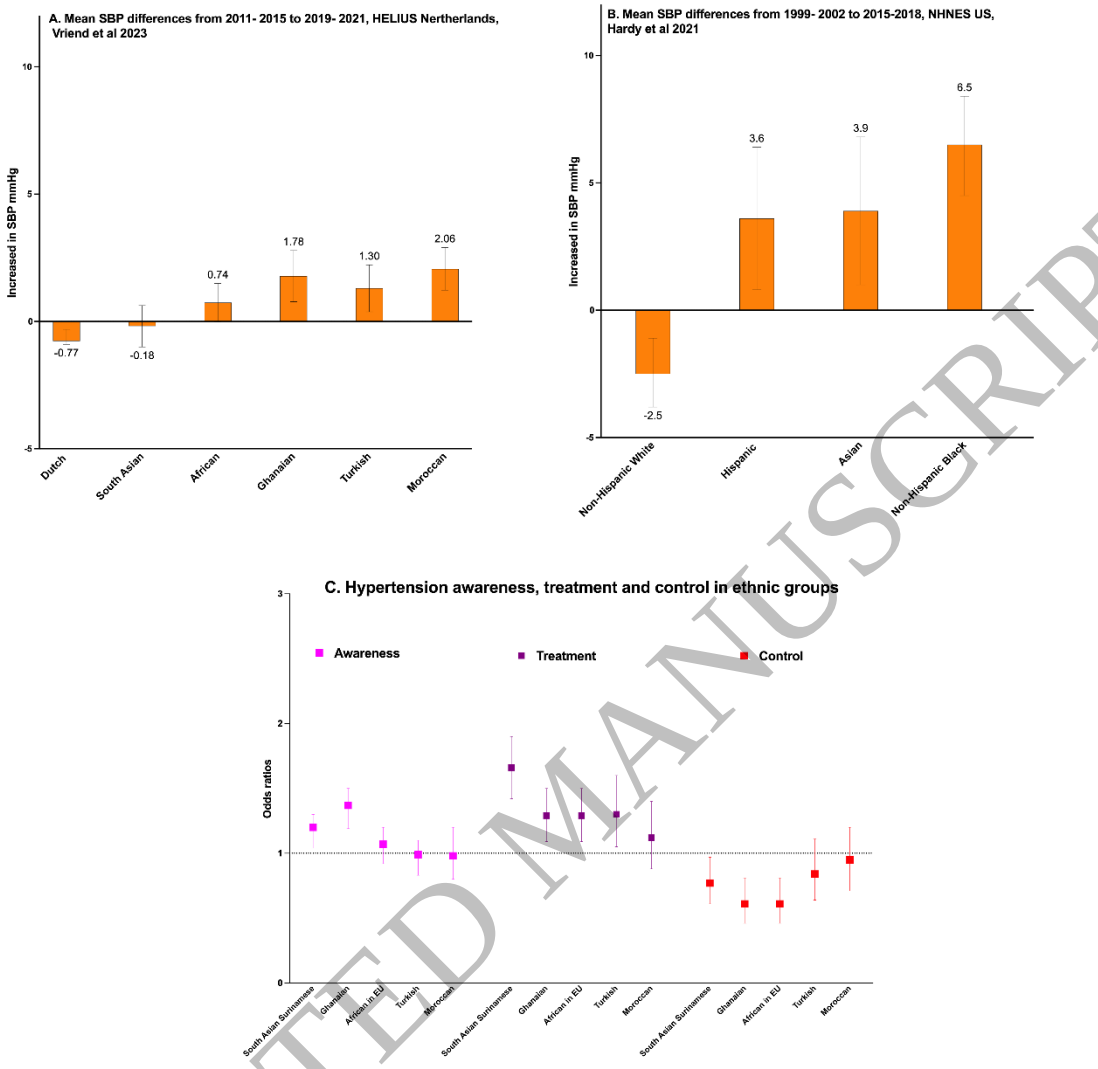

Figure A. Vriend et al 2023, Ethnic differences in systolic blood pressure(SBP) levels (in mmHg) at follow-up adjusted by age and sex, compared with Dutch reference population at baseline using data from HELIUS study, Netherlands. Figure B: Hardy et al 2021, racial and ethnic differences in SBP compared to Non-Hispanic White adjusted for socio-demographic, health care, BMI, diabetes, kidney disease and prior cardiovascular disease, using data from US National Health and Nutrition Examination Survey(NHANES) in 1999-2002 and 2015-2018 cycles. Figure C: van der Linder et al 2021, comparison of hypertension awareness, treatment and control among ethnic minority with European host propulsion using BP cut-offs of systolic >140 and/or diastolic >90 in Europe, a systematic review and meta-analysis.

Figure 1
159x166 mm (x DPI)