The effect of internal migration on changes in blood pressure among women in South Africa

Chantel F. Pheiffer
University of Massachusetts Boston

Stephen T. McGarvey
School of Public Health, Brown University

Carren Ginsburg
Medical Research Council/Wits Rural Public Health and Health Transitions Research Unit (Agincourt), School of Public Health, Faculty of Health Sciences, University of the Witwatersrand

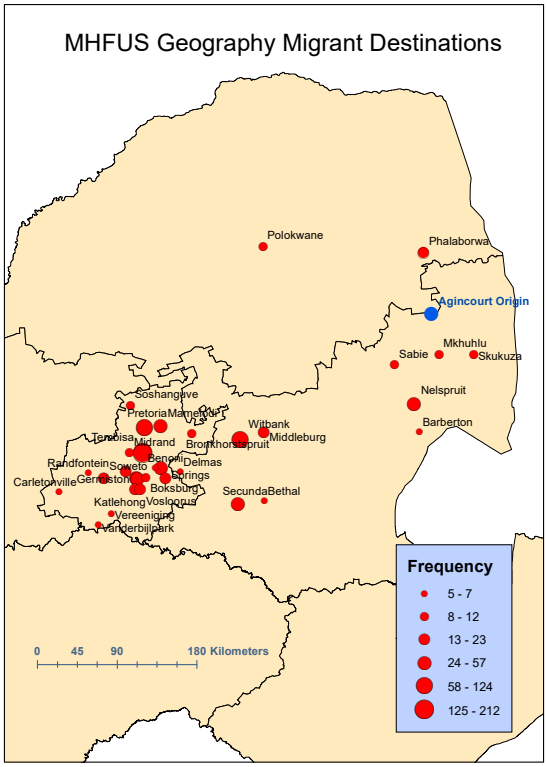
Michael J. White
Population Studies & Training Center, Brown University

Introduction

Eighty-five percent of the world's 15 million premature non-communicable disease (NCD)-related deaths occur in low and middle-income countries (LMICs) each year, with elevated blood pressure (BP) constituting the leading metabolic risk factor for NCDs (WHO 2023). Consequently, understanding what drives the high prevalence and rising incidence of BP in transitioning contexts is an increasingly urgent public health priority. Global agenda-setting organizations like the World Health Organization acknowledge that economically vulnerable populations are especially at risk of suffering and dying from NCDs, but our understanding of the social and behavioral correlates and predictors of elevated BP remains limited. In addition to being resource poor in terms of healthcare infrastructure and services, LMICs are also characterized by high levels of geographic mobility—internal migration—that may affect NCD risk exposures and burden.

Migration might affect BP through several psychosocial stress pathways: migration is a process that involves physical relocation which could be stressful and dangerous. Migration also necessitates some degree social dislocation from origin communities and usually requires reliance on social networks in destination places, which may be more, or less, dependable. It also often implies a tremendous amount of uncertainty about work, living conditions, safety. And, importantly, migration

is a social experience attached to expectations around migration behavior, remittance practices, frequency of returning home, and caregiving and caretaking responsibilities while migrants are away. But, this pervasive, social, stressful process is not very well studied in the literature so we don't know very much about its implications for health. In studies where migrants are identified or recruited in SSA, their health is most often studied in terms of fertility, maternal mortality, and HIV infection (Anglewicz et al. 2016; Deane et al. 2010; Rokicki et al. 2014). Despite the large and growing problem of NCDs, few studies have examined the implications of internal migration for NCD risk in SSA. Building on work that finds a positive and gendered association between migration and elevated BP in the cross-section (Pheiffer et al. 2023), this study examines evidence for whether this association holds when examining changes in blood pressure over time.



Data & Methods

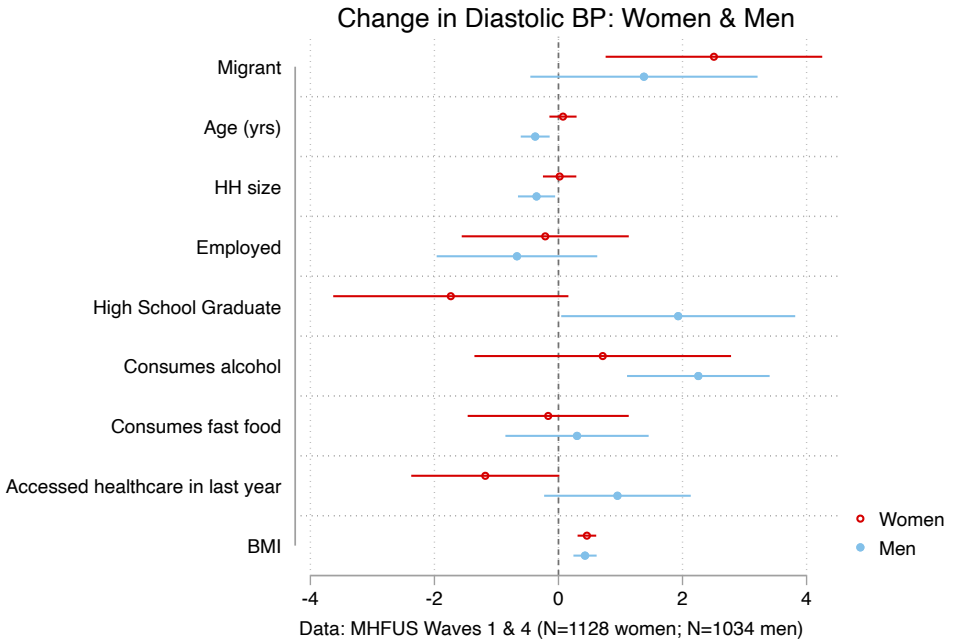
We use data collected in 2018 (baseline) and in 2022 (follow-up) from the Migrant Health Follow-Up Study, a longitudinal cohort study of residents aged 18-40 at baseline who are members of households within the Agincourt Health and Socio-Demographic Surveillance System in rural northeast South Africa (Ginsburg et al. 2024). The sample consists of non-migrants (residents of the rural Agincourt HDSS) and migrants (individuals connected to AHDSS households but whose current usual residence lies outside of the AHDSS) (Map 1). We use the wave 1 baseline sample for whom we have valid BP measurements at both time points, resulting in a sample of 1128 women and 1134 men. We stratify

our analyses by sex and estimate the relationship between migration and health using individual-level fixed effects. We control for socioeconomic, demographic, health, and health behavior characteristics.

Preliminary Findings

We find that a migration event results in elevated BP among women controlling for socioeconomic, demographic, health, and health behavior characteristics (Figure 1). We observe no parallel increase in BP with a migration event among men. This finding is consistent with earlier findings we reported using only the wave 1 baseline data (Pheiffer et al. 2023), but further suggests that this positive association is not due to selection, i.e. women with elevated BP are not more likely to out-migrate. Instead, migration results in BP elevations at the individual level. In addition, we find that the magnitude of the migration-BP relationship depends on the urban destination to which female migrants move. These findings are robust and statistically significant for both systolic and diastolic blood pressure, and regardless of model specification.

Figure 1: Sex-stratified individual-level fixed-effects analyses of internal migration and blood pressure



Conclusions

Our research suggests that the intersection of gender and migration status is creating a distinct health penalty for women in South Africa in terms of elevated BP and therefore NCD risk. These findings underscore the importance of investigating the social and demographic determinants of NCD risk in low-resource rapidly urbanizing settings.

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