

## COMMENTARY

# Inadequate hypertension control rates: A global concern for countries of all income levels

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Hypertension detection and management is at the forefront of global healthcare and in order to address hypertension control, Turé et al. performed a vital and opportune study geared toward establishing the prevalence, awareness, treatment, and control rates of hypertension in Guinea-Bissau, West Africa.<sup>1</sup> Worldwide, hypertension is the leading risk factor for cardiovascular disease and premature death and medical evidence demonstrates that blood pressure reduction significantly reduces cardiovascular events.<sup>2</sup> This benefit far outweighs the risk of treatment, including pharmacologic side effects, and is cost effective even in low- to middle-income countries. Factors including high dietary sodium intake, excessive alcohol consumption, poor diet, and a sedentary lifestyle contribute to the development of hypertension. Optimization of these risk factors (also called lifestyle modification or nonpharmacologic treatment) can lower blood pressure and improve clinical outcomes. However, in most cases, lifestyle modification alone fails to control blood pressure adequately. Thus, individuals require pharmacologic therapy along with lifestyle modification to reach target blood pressure. The clinical effects of poorly controlled hypertension are well-established and result from hypertensive target organ damage such as cardiac disease (congestive heart failure, myocardial infarction, angina, left ventricular hypertrophy, and arrhythmias), cerebrovascular disease (stroke and cognitive decline), renal disease (chronic renal failure and dialysis), and vascular disease (accelerated atherosclerosis and retinopathy).<sup>2</sup> Despite countless and long-standing studies showing the benefit of strict blood pressure control in the prevention of hypertension-induced target organ damage and its associated morbidity and mortality, hypertension control rates (defined as a systolic blood pressure < 140 mmHg and a diastolic blood pressure < 90 mmHg) are meager. Recent global data on the diagnosis, treatment, and con-

trol rates of hypertension estimates that only 54% of people who have hypertension have been diagnosed, 42% of people with hypertension are both diagnosed and treated pharmacologically, yet only 21% of people with hypertension have controlled blood pressure. Even though 70% of this data is from low- to middle-income countries,<sup>3</sup> countries of all levels of incomes have dismal control rates. In fact, high-income countries such as the United States have seen a disturbing decline in control rates. Recent data from the National Health and Nutrition Examination Survey (NHANES) showed that hypertension control rates in the US had increased over the past decades, reaching a high of between 50% and 60% in the 2013/2014 survey. However, for the first time, the most recent survey in 2017/2018 showed a marked decline in the control rate to 44%.<sup>4</sup> This NHANES data was so striking that the US Surgeon General published a call to action in 2020, making hypertension control a national priority.<sup>5</sup> Importantly, this decrease in hypertension control parallels the increase in cardiovascular disease, particularly stroke, seen over a similar time-period. These poor hypertension control rates and related increase in associated complications underscore the need for initiatives to determine local population hypertension awareness, detection, treatment, and the overall need for novel strategies to increase hypertension control.

To address the urgency of improving hypertension control, Turé et al. performed a timely study, mentioned above, in Guinea-Bissau, West Africa.<sup>1</sup> Guinea-Bissau is a small low- to middle-income country in West Africa with an estimated population of 1,726,000.<sup>6</sup> The authors used data from the most recent census and selected a sample of 973 adults living in 373 households in Bissau, the capital of Guinea-Bissau, with a total population of 492,004 (2015).<sup>6</sup> Trained interviewers measured blood pressure using an automated,

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oscillometric device with appropriate technique and cuff size. Each participants' blood pressure was measured twice (three times if the initial two systolic or diastolic measurements differed by more than 10 mmHg). They recorded the mean of either the first two or the last two readings as the blood pressure. Approximately 27% of the 973 individuals surveyed had hypertension, defined as a systolic blood pressure  $\geq 140$  mmHg, a diastolic blood pressure  $\geq 90$  mmHg, and/or the presence of antihypertensive medication therapy in the previous 2 weeks. Approximately half (51.4%) of those individuals with hypertension were aware of their diagnosis. Among those aware of their diagnosis of hypertension, 51.8% (or 26% of those individuals with hypertension) had taken antihypertensive medications in the previous 2 weeks but only 49.9% of those (or 13% of those individuals with hypertension) had controlled blood pressure. Women were more likely to be aware of their diagnosis, to report pharmacologic treatment, and to have a controlled blood pressure. Men tended to have a higher systolic blood pressure. In addition, the prevalence of hypertension increased with age, higher socioeconomic position, and lack of formal education.

The authors propose several potential reasons for the poor control rate of hypertension in this population including inadequate access to healthcare facilities, high cost of pharmacologic therapy, poverty, and prioritization of communicable diseases (for instance, malaria, tuberculosis, and HIV) over noncommunicable diseases such as hypertension. The authors also recognize some limitations of their study that might have led to an overdiagnosis of hypertension. Such limitations include that the blood pressure was measured only on a single occasion, the study was conducted only in the capital city of Bissau, and the participants studied were not randomly selected within each household (although this was addressed by using a weight correction). The results obtained in this manuscript confirm the high prevalence of hypertension in adults; mirror the trends in other countries; and add to our understanding of the prevalence, awareness, treatment, and control of hypertension in low- to middle-income countries.

This article highlights the poor control rates of hypertension in a low-income country such as Guinea-Bissau. The preoccupying question now is what should be done with this data to improve hypertension detection, awareness, treatment, and most importantly control. A first step is to look at what has been done in other healthcare systems and populations that have successfully addressed and increased hypertension control rates. One such model is the Kaiser Permanente healthcare system in the state of California in the US established in 1945, Kaiser Permanente is one of the largest healthcare systems in the US, with approximately 12 million members.<sup>7</sup> Kaiser Permanente used evidence-based pharmacologic hypertension treatment protocols along with access to essential medications, timely follow-up periods, team-based care, robust progress monitoring, and timely clinician/clinic feedback. Using this population-based approach, the Kaiser Permanente hypertension program rapidly exceeded state and national blood pressure control rates, achieving a system-wide hypertension control rate of up to 90%.<sup>8</sup> This improved population control of hypertension was associated with reductions in cardiovascular events.<sup>9</sup> The foundation of the pharmacologic treatment protocol was initiating two complementary antihypertensive medications in the ini-

tial treatment of newly diagnosed hypertension, as well as detailing the dose titration steps and intervals and the use of additional antihypertensive medications to achieve blood pressure control.

Another model is the Global HEARTS initiative and the HEARTS in the Americas Program of the World Health Organization (WHO) and the Pan American Health Organization (PAHO) respectively (HEARTS is otherwise known as Healthy-lifestyle counseling, Evidence-based treatment protocols, Access to essential medicines and technology, Risk-based CVD [cardiovascular disease] management, Team-based care, and Systems for monitoring). This model serves as a blueprint for the implementation of a standardized, population-based approach to treating hypertension in the primary health care setting. Specifically, the HEARTS technical package contains six modules:

1. Healthy-lifestyle counseling identifies behavioral risk factors for cardiovascular disease and describes techniques to encourage changing these risk factors;
2. Evidence-based treatment protocols include how to measure blood pressure appropriately and provide sample hypertension treatment protocols;
3. Access to essential medicines and technology provides information on supply chain management of cardiovascular medications including procurement, distribution, management, and handling supplies;
4. Risk-based cardiovascular disease management defines how to use a risk-based approach to assess and manage cardiovascular disease;
5. Team-based care explains the advantage of using an interdisciplinary team to provide patient care centered around evidence-based protocols; and
6. Systems for monitoring contain information on monitoring and reporting on hypertension prevalence, awareness, treatment, and control.<sup>10</sup>

It is important to note that while the HEARTS program uses a population-based framework, it also allows for individualization of care based on the demographics, culture, and economics of each community, state, country, or region.

A barrier to controlling hypertension, especially in low- to middle-income countries, is the lack of hypertension guidelines potentially applicable to the local milieu and/or the complexity of existing guidelines. To mitigate this barrier while also recognizing the overwhelming burden of hypertensive-related cardiovascular disease, regardless of socioeconomic status or country, the WHO recently published guidelines for the pharmacologic treatment of hypertension in adults.<sup>11</sup> The guidelines recommend initiating pharmacologic treatment immediately when diagnosed at a systolic blood pressure  $\geq 140$  mmHg or a diastolic blood pressure  $\geq 90$  mmHg in those without comorbidities (with a target of  $<140/90$  mmHg) and at a systolic blood pressure  $\geq 130$  mmHg in those with known cardiovascular disease, high cardiovascular risk, diabetes mellitus, or chronic kidney disease (with a target of  $<130/90$  mmHg). The guidelines acknowledge that a comprehensive plan for lifestyle modification is also essential in parallel to pharmacologic treatment. The WHO recommends obtaining initial laboratory testing and assessing cardiovascular risk without delaying phar-

macologic treatment and initiating pharmacologic treatment with a long-acting agent from the following classes: thiazide or thiazide-like agent, a renin-angiotensin-aldosterone system inhibitor (angiotensin-converting enzyme inhibitor or angiotensin receptor blocker), or a dihydropyridine calcium channel blocker. Importantly, to improve adherence and persistence to care and to increase blood pressure control, the WHO suggests initiating combination therapy, preferably with a single-pill combination, with two long-acting medications from two of the three recommended classes. The WHO suggests monthly follow up after initiation or a change in antihypertensive medications until patients reach target. Finally, given the increasing prevalence of hypertension, the WHO guidelines support the option of other health professionals (such as pharmacists and nurses) prescribing antihypertensives as long as they have proper training, prescribing authority, specific management protocols, and physician oversight.<sup>12</sup> Many, if not all, of the initiatives and experiences from successful healthcare systems; the information included in the Global HEARTS Initiative and Technical Package, including the HEARTS in the Americas Program; and the positive experience gained from early adopting countries, as well as other programs such as Resolve to Save Lives, applies to countries of all income levels.

This study by Turé et al. substantiates and extends our knowledge surrounding hypertension in Sub Saharan Africa. It confirms the high prevalence of hypertension and the low awareness, treatment, and control of hypertension. These findings should reinforce and strengthen our efforts to increase pharmacologic treatment in conjunction with healthy lifestyle modification in all individuals with hypertension. We have developed and now possess tools and guidelines for hypertension that are applicable globally. While these guidelines should always be reviewed and updated, we need not delay implementation strategies to put these tools into clinical practice to increase hypertension control rates and address the growing burden of cardiovascular disease in all counties regardless of income level.

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Donald J. DiPette is a Distinguished Health Sciences Professor, University of South Carolina and University of South Carolina School of Medicine, Columbia, SC.

#### CONFLICT OF INTEREST

The authors have no competing interests.

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