# Challenge for Hypertension Prevention and Control Worldwide: The Time for Action

Daniel Lemogoum, MD, PhD

*From the School of Medicine and Pharmaceutical Sciences, University of Douala, Douala, Cameroon*

Cardiovascular diseases (CVDs) are the leading cause of global preventable morbidity and mortality in adults worldwide.[1,2] A strong body of evidence clearly shows that high blood pressure (BP) is the leading and powerful reversible driver of premature deaths from CVDs globally.[2–5] However, the greatest burden of hypertension-related deaths and disability occurs in low- and middle-income countries (LMICs) that have limited resources and a scarcity of prevention and control programs.[2–4,6]

In LMICs, programs to detect hypertension are either not present or have very low capacity, and this results in a large majority of people with hypertension being undiagnosed. Moreover, even among diagnosed individuals, treatment and control rates are extremely poor, especially in LMICs.[3–8] In these scenarios, uncontrolled hypertension is associated with disabling end-organ damage such as heart disease, stroke, and renal disease at much younger ages than in high-income countries and strike people within the workforce, damaging economies and creating poverty in families.[5–9] Treatment and control of high BP results in significant reduction of cardiovascular events[5,10] but are often not available due to lack of healthcare facilities and financial constraints.

To curb the hypertension burden in LMICs, it is imperative to develop comprehensive programs to identify and control hypertension and to prevent BP elevation. The adoption of global goals by the United Nations (UN) aiming to reduce the burden of noncommunicable disease was an important start. The UN called for a reduction in hypertension by 25%, to reduce dietary salt by 30%, and for 50% of eligible people to receive drug therapy and counseling to prevent CVDs. However, many gaps need to be addressed in priority by national governments, especially in LMICs. In many countries, there is even a lack of epidemiological data to assess the hypertension prevalence, awareness, treatment and control rates, and determinants of hypertension to guide national policy.

The World Hypertension League (WHL) is a coalition of national hypertension organizations with the mission to reduce the burden of CVDs around the world through improvement of hypertension prevention and control. The International Society of Hypertension (ISH) is a specialty and research-focused organization promoting and encouraging the advancement of scientific research and knowledge of the prevention and management of hypertension and related diseases. In line with UN goals, the WHL-ISH 2014 Fact Sheet on urgent and important needs for prevention and control of high BP articulates the situation well. The fact sheet calls for major changes and responses that will contribute substantially to achieve the UN targets. The responses include major realigning of hypertension organizations, civilian society, and governments toward prevention and control of high BP.

The cost of inaction is enormous, considering more than 9 million deaths are attributed to increased BP annually. The numbers of disabled are larger and their families, workplaces, and communities are adversely impacted.[3,9–12] Evidence clearly demonstrates that[5,8,9] the current increasing burden of hypertension is largely attributable to behavioral factors such as unhealthy diet (excessive salt and alcohol consumption, low fruit and vegetable consumption), physical inactivity, and obesity. A diet of excessive salt remains a major contributor to hypertension and CVDs.[8] Similarly, low dietary intake of vegetables and fruits and a sedentary lifestyle encourage the development of the cardiometabolic syndrome and its phenotypes such as hypertension, type 2 diabetes mellitus, and obesity, with the increased risk of CVDs.[9] Convincing evidence indicates that cost-effective sustainable behavioral changes comprising lifestyle improvement, including reduction of salt consumption, increased fruit and vegetable consumption, and physical activity, lead to significant BP reduction and improved control of hypertension.[8,9,13,14] In that respect, we recently reported lower arterial stiffness and hypertension risk among Cameroonian traditional pygmies living in hunter-gatherer communities who consume a diet that is low in salt, fat, and calories and is high in fruits and vegetables, and who engage in regular physical activity, in comparison to that of contemporary pygmies and bantus with "western lifestyles."[15]

Evidence from clinical trials demonstrates that BP lowering with antihypertensive drugs is associated with significant reductions in cardiovascular mortality and disability.[5,14,16–18] However, despite the overwhelming evidence and the benefits seen in high-income countries, high BP remains poorly controlled and awareness low in LMICs.[6,7,11] This highlights the pressing need for more intensive efforts and actions to reduce the disease and mortality burden caused by hypertension in low-resource settings through implementation of cost-effective and context-specific management strategies. The

**Address for correspondence:** Daniel Lemogoum, MD, PhD, PO Box 3839, Douala, Cameroon
**E-mail:** dlems2002@yahoo.fr

**DOI: 10.1111/jch.12373**

effectiveness and efficacy of antihypertensive therapy has been successfully tested in some LMICs, eg, in the New vs Old Antihypertensive Agent in African Hypertensive Patients (NOAAH) study.[18] The NOAAH study showed that newer antihypertensive agents were more effective than conventional drugs in reducing BP and keeping it controlled in black hypertensive patients born and living in sub-Saharan Africa. However, several barriers to management of high BP need to be addressed such as drug availability, affordability, acceptability, and adherence. The majority of patients in LMICs discontinue their treatment, even in settings where accessibility is free of charge; hence, it is important to implement global health policy that integrates hypertension management into chronic disease programs in primary healthcare centers and encourages simplified regimens such as combination tablets. Moreover, antihypertensive treatment adherence will significantly improve with a polypill combination rather than with a combination of components given separately.[19]

An important initial step is to identify and screen for people with hypertension with appropriate and accurate measurement of BP. In that purpose, since BP decreases with repeat measures,[10,17,20] the repeated BP measurements are highly relevant, and should be encouraged in daily practice and be integrated in operational guidelines. Importantly, implementation of repeated BP measurements is a key method to avoid erroneous, false diagnoses and overestimation of hypertension prevalence and incidence. Therefore, one major and valuable step is the recently developed WHL resources for BP screening programs. The resources are designed to be easy to use to aid local and national hypertension organizations and governments in developing hypertension screening programs to help address the current gap in awareness of hypertension.[20] Beyond accurate BP measurement, availability of affordable BP screening devices is another major challenge when addressing prevention and control of hypertension. The WHL has also developed a policy statement to support using automated devices for assessment of BP and is working with device companies to try to make these devices more available. The development of BP screening programs that initially focused on low-resource healthcare settings and in community settings as advocated by the WHL represents a major step in the prevention and control of high BP. Furthermore, and as stressed by the WHL, screening of BP needs to be linked to management of patients with hypertension, and a variety of barriers should be addressed in priority such as clinical inertia, including lack of context-specific guidelines, lack of training of clinicians and other nonphysician health providers on management and prevention of hypertension, and the lack of basic infrastructure, coupled with clinician inertia who do not routinely assess BP and do not initiate and or properly titrate antihypertensive medication in hypertensive individuals.

Ultimately, effective hypertension prevention and control calls for comprehensive and appropriate public health policy coupled with high-risk individual strategies as advocated by the recent international guidelines.[10,17] While those guidelines recommend more aggressive BP control using both behavioral intervention and appropriated antihypertensive drugs to reduce the burden of hypertension complications, the mechanisms to facilitate and improve accessibility to cost-effective antihypertensive therapy remain a major challenge for many developing nations with a jeopardized healthcare system and where antihypertensive drugs are largely unaffordable. Thus, beyond the crucial and highly relevant WHL policy statement on high BP prevention and control, a broad partnership of key players, innovative funding mechanisms, and increased national and international commitment for the prevention and control of hypertension in LMICs is needed, with particular attention on availability and accessibility of essential antihypertensive medication.

Furthermore, another key innovative strategy to reduce premature death from hypertension will be the creation of a hypertension champions program involving healthcare professionals with the mission to become advocates of best evidence-based prevention, treatment, and control of high BP; journalists to help build awareness and media coverage of hypertension as preventable and to influence national and or international policy; and emerging leaders from civil society who have the ambition to help drive the global hypertension agenda, promoting best practice, influencing national policy, and strengthening health system responses to the hypertension pandemic.

Finally, and in line with recommendations from EUROASPIRE, it is important to invest in preventive measures rather than in expensive acute and curative care.[21] This requires developing a high capacity to implement BP screening, coupled with risk assessment and hypertension management, and linking it with an appropriate health policy and health education program. Ultimately, adequate hypertension control with cost-effective and resource-sensitive antihypertensive agents, together with a healthy environment supporting healthy behavior changes, is imperative to mitigate the morbidity and mortality associated with hypertension. Importantly, and as stressed above, tackling inertia is also essential, with a focus on patient inertia by encouraging dialogue on adherence to treatment; physician and nonphysician healthcare provider inertia by training and sensitizing them to be more engaged and improve and integrate routine management of BP in their settings; and health policy decision maker inertia by encouraging national governments to implement effective sustainable policies and strategies aiming to prevent hypertension and improve its control.

## References

1. World Health Organization. Global status report on noncommunicable diseases 2010. Report, iii-161. 2011. Geneva, Switzerland; WHO Press: World Health Organization.
2. Dalal S, Beunza JJ, Volmink J, et al. WHO. Projections of mortality and burden of disease 2002–2030. *Int J Epidemiol*. 2011;40:885–901.

3. Lim SS, Vos T, Flaxman AD, et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*. 2013;380:2224–2260.
4. World Health Organization. A global brief on hypertension: silent killer, global public health crisis. World Health Day 2013. Report, 1–39. 2013. Geneva, Switzerland; World Health Organization.
5. Lewington S, Clarke R, Qizilbash N, et al. Age-specific relevance of usual blood pressure to vascular mortality: a meta-analysis of individual data for one million adults in 61 prospective studies. *Lancet*. 2002;360:1903–1913.
6. Ibrahim MM, Damasceno A. Hypertension in developing countries. *Lancet*. 2012;380:611–619.
7. Commodore-Mensah Y, Samuel LJ, Dennison-Himmelfarb CR, Agyemang C. Hypertension and overweight/obesity in Ghanaians and Nigerians living in West Africa and industrialized countries: a systematic review. *J Hypertens*. 2014;32:464–472.
8. Committee on Public Health Priorities to Reduce and Control Hypertension in the U.S. Population, Institute of Medicine of the National Academies. A population-based policy and systems change approach to prevent and control hypertension. Report, v-173. 2010. Washington, DC; National Academies Press.
9. Danaei G, Singh GIM, Paciorek CJ, et al. The global cardiovascular risk transition: association of four metabolic risk factors with national income, urbanization, and Western diet in 198 and 2008. *Circulation*. 2013;127:1493–1502.
10. Dhlöf B, Sever PS, Poulter NR, et al. Prevention of cardiovascular events with an antihypertensive regimen of amlodipine adding perindopril as required versus atenolol adding bendroflumethiazide as required, in the Anglo-Scandinavian Cardiac Outcomes Trial-Blood Pressure Lowering Arm (ASCOT-BPLA): a multicenter randomized controlled trial. *Lancet*. 2005;366:895–906.
11. Perkovic V, Huxley R, Wu Y, et al. The burden of blood pressure-related disease: a neglected priority for global health. *Hypertension*. 2007;50:991–997.
12. Gaziano TA, Bitton A, Anand S, Weinstein MC. The global cost of nonoptimal blood pressure. *J Hypertens*. 2009;27:1472–1477.
13. Athanasakis K, Souliotis K, Tountas Y, et al. A short-term cost-effectiveness analysis hypertension treatment. *J Cardiol Hellenique*. 2014;55:197–203.
14. Elmer PJ, Obarzanek E, Vollmer WM, et al; PREMIER Collaborative Research Group. Effect of comprehensive lifestyle modification on diet, weight, physical fitness, and blood pressure control: 18-month results of a randomized trial. *Ann Intern Med*. 2006;144:485–495.
15. Lemogoum D, Ngatchou W, Janssens C, et al. Effects of hunter-gatherer subsistence mode on arterial distensibility in Cameroonian pygmies. *Hypertension*. 2012;60:123–128.
16. ESH/ESC Task Force for the Management of Arterial Hypertension. Practice guidelines for the management of Arterial Hypertension of the European Society of Hypertension (ESH) and the European Society of Cardiology (ESC): ESH/ESC Task Force for Management of Arterial Hypertension. *J Hypertens*. 2013;31:1925–1938.
17. Weber MA, Schiffrin EL, While WB, et al. Clinical practice guidelines for management of hypertension in the community. A statement by the American Society of Hypertension and the International Society of Hypertension. *J Clin Hypertens (Greenwich)*. 2014;16:14–26.
18. M'Buyamba-Kabangu JR, Anisiuba BC, Ndiaye MB, et al. Efficacy of newer versus older antihypertensive drugs in black patients living in sub-Saharan Africa. *J Hum Hypertens*. 2013;27:729–735.
19. Ndindjock R, Gedeon J, Mendis S, et al. Potential impact of single-risk-factor versus total risk management for prevention of cardiovascular events in Seychelles. *Bull World Health Organ*. 2011;89:286–295.
20. Campbell NR, Berbari AE, Cloutier L, et al. Policy statement of the world Hypertension league on noninvasive blood pressure measurement devices and blood pressure measurement in the clinical or community settings. *J Clin Hypertens (Greenwich)*. 2014;16:320–322.
21. Kotseva K, Wood D, De Backer G, et al, for the EUROASPIRE study Group. Cardiovascular prevention guidelines in daily practice: a comparison of EUROASPIREI, II, and III surveys in eight European countries. *Lancet*. 2009;373:929–940.