Controlling Hypertension to Prevent Target Organ Damage: Perspectives from the World Hypertension League President

Daniel T. Lackland, DrPH[1]

The evidence from epidemiological and observational studies over the past five decades consistently identify a significant association of blood pressure level and disease risks for both sexes, all races and cultures, as well as all age groups. The evidence is strong such that clinical guidelines and intervention programs focus on blood pressure management and lower blood pressure levels for primary and secondary stroke prevention supported and promoted by numerous organizations including the World Hypertension League. These comprehensive components of population risk reduction are ideal models for the clinical medicine and population health partnership, and timely for global implementation. The accelerated decline in blood pressure-related outcomes (eg, stroke mortality), which began in the 1970s in the US and Western countries, included models for aggressive detection, treatment and control strategies for hypertension. These strategies can be implemented on a global scale to respond to the global risks from blood pressure, which is developing in the most vulnerable populations. *Ethn Dis*. 2016; 26(3):267-270; doi: 10.18865/ed.26.3.267

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[1]Division of Translational Neurosciences and Population Studies; Department of Neurology, Medical University of South Carolina

Address correspondence to Daniel T. Lackland, DrPH; President, World Hypertension League; Department of Neurology, Medical University of South Carolina; Harborview Office Tower, Suite 501; Charleston SC 29425; 843.876.1141; lackland@musc.edu

Hypertension has long been recognized as a major risk factor for cardiovascular disease, stroke, heart failure, end-stage renal disease, peripheral vascular disease, and cerebrovascular disease with significant impact on more than a billion people worldwide.[1] As the global population is growing and aging, the impact of elevated blood pressure has significantly increased with the number of people worldwide with uncontrolled hypertension (systolic blood pressure ≥140 mm Hg and/or diastolic blood pressure ≥90 mm Hg) increased from 605 million to 978 million between 1980 and 2008.[2] Using the metric of disability-adjusted life years (DALYs) as an indicator of disease burden on the population, high blood pressure is now the number one risk factor in the world.[3]

Hypertension-related outcomes are, as would be expected, very consistent with the trends in blood pressure levels. As an example, more than 15 million people globally suffer a stroke each year with highest rates found among those with uncontrolled high blood pressure.[3] While the rate of stroke mortality is declining, primarily in developed countries and largely due to better control of high blood pressure, the absolute number of strokes continues to increase because of the aging population.[3,4] Likewise, mortality rates from cardiovascular and coronary heart disease have decreased in North America and western European countries due to improved prevention, diagnosis and treatment, including lower average levels of blood pressure.[3,4] As

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for stroke, it is expected that more than 80% of the future increase in coronary heart disease mortality will occur in developing countries. [3,4]

Hypertension-related outcomes including stroke, end-stage renal disease and heart failure demonstrate some of the greatest ethnic and racial

disparities in disease outcomes globally. However, the majority of these adverse outcomes could have been prevented or delayed with treated and controlled high blood pressure regardless of demographics. Thus, hypertension should be considered the most important preventable cause of premature death worldwide.

While the global impact of high blood pressure is significant, hypertension control and prevention programs can be implemented to reduce the disease burden on populations around the world.[4] Multiple structured prevention and management strategies and programs with hypertension as the major public health focus have been developed to reduce the impact of elevated blood pressure on the population.[5-7] These programs were based on the population-based premise that if the elevation of blood pressure with age can be prevented or reduced, hypertension-related outcomes including stroke, heart failure and end-stage renal disease will be significantly affected. In addition to clinical treatment and control of elevated blood pressure, these programs incorporate risk factor reduction including: excess body weight; excess dietary sodium intake; reduced physical activity; inadequate intake of fruits, vegetables, and potassium; and excess alcohol intake.[8, 9] These programs are aimed at reducing salt in the food supply, detecting and tracking high blood pressure at churches, worksites and community events and conducting public education campaigns.[4]

As indicated, population-based approaches incorporate a public health strategy that complements the clinical hypertension treatment and management. Primary prevention strategies are implemented to reduce blood pressure levels in the population, particularly among individuals in the pre-hypertension category (<140/90 mm Hg). This approach serves to decrease the blood pressure levels with substantial reduction in high blood pressure outcomes, and to delay the onset of hypertension.[4] Stamler and colleagues estimated two decades ago that a 5 mm Hg reduction of SBP in the adult population would result in a 14% overall reduction in mortality due to stroke.[10] Indeed, a recent report showed the significant reduction in the population systolic blood pressure distributions consistent with the significant reduction in stroke mortality reduction.[4] This shift in the total distribution indicates the influence in the treated clinical hypertensive population as well as public health efforts in blood pressure control among persons with blood pressures <140/90 mm Hg over this same extended century-long period.

Structured programs focused on hypertension as a population focus, including the National High Blood Pressure Education Program from the National Heart, Lung and Blood Institute, were developed and implemented under this premise of high blood pressure prevention, treatment and control as a means to reduce the burden of adverse outcomes.[11] These types of programs address both the clinical and public health efforts in an essential partnership for this population burden.[12] Likewise, the National High Blood Pressure Education Program established an extensive network of federal, state, community, professional association and private sector partnerships working together to prevent, detect, treat and control high blood pressure. The network included community groups, all state health departments, seven federal agencies and a Coordinating Committee of professional and voluntary agencies, which set national policy for hypertension control.

While elevated blood pressure has long been 'synonymous' with stroke, cardiovascular and renal outcomes, the association of hypertension and disease has been strengthened with evidence from randomized controlled trials and population studies showing the reduction of blood pressure with lower disease risks.[13] Recent meta-analyses have clearly demonstrated relative risk reductions proportional to the magnitude of the blood pressure reductions achieved.[14-17] Basically, reduction in systolic blood pressure significantly reduced the risk of major

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cardiovascular disease events, coronary heart disease , stroke, and heart failure resulting in significant population risk reduction. In addition, the results of the Systolic Blood Pressure Intervention Trial (SPRINT) have confirmed the evidence describing the benefit of intense hypertension treatment for the primary and secondary prevention of hypertension-related outcomes.[18-19] As clinical guidelines have become more evidence-based, the results of these studies demonstrating the benefit of hypertension treatment and control, as well as prevention, are essential to incorporate into clinical practice and structured population programs to address the aging population and global risks.[20]

The World Hypertension League (WHL), in an official relationship with the World Health Organization (WHO), was established to focus on the global risks of hypertension and strategies and programs for population high blood pressure control and prevention. WHL is the only nongovernmental organization (NGO) at WHO with a mission strictly devoted to hypertension prevention, management and control in the population. The inclusion of WHL among the professional NGOs at WHO is particularly helpful in stabilizing and facilitating ongoing projects, which include hypertension detection and surveillance, the production of hypertension awareness materials for the public including World Hypertension Day, the development of combined sessions and symposia at international conferences, and involvement in WHO campaigns to prevent hypertension including a focus on salt reduction in global diets.[21-27] A major objective of the WHL is professional education for the health care workforce team, including physicians, nurses, pharmacists, physician assistants and community health care workers with access to the current evidence and resources for population hypertension detection, prevention and control.

In summary, evidence from multiple sources identifies the impact of blood pressure on a substantial body of information that helps assess the absolute and relative risk reduction decline attributed to blood pressure reduction.[28] The evidence from epidemiological and observational studies over the past five decades consistently identify a significant association of blood pressure level and disease risks for both sexes, all races and cultures, as well as all age groups. The evidence is strong for clinical guidelines and intervention programs to focus on blood pressure management and lower blood pressure levels for primary and secondary stroke prevention supported and promoted by numerous organizations including the World Hypertension League. These comprehensive components of population risk reduction are ideal models for clinical medicine and population health partnership and timely for global implementation. The accelerated decline in blood pressure-related outcomes including stroke mortality that began in the 1970s in the United States and Western countries, included models for the aggressive hypertension detection, treatment and control strategies implemented during this time period. These strategies can be implemented on a global scale to respond to the global risks from blood pressure that are developing in the most vulnerable populations.

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