E levated blood pressure has been recognized since the early 20th century as an indicator of adverse cardiovascular risk and mortality, with increased rates of disease with higher systolic and diastolic blood pressure levels. Results from early hypertension treatment studies from the Veterans Administration Cooperative Study Group on Antihypertensive Agents determined that treating and lowering blood pressure levels among patients with high blood pressure was associated with reduced cardiovascular disease and stroke risks. These successful blood pressure reductions and adverse risk outcomes were demonstrated in the population as a whole, leading to strategies for hypertension control. These strategies for population and clinical programs focused on the diagnosis, treatment, and control of hypertension are associated with the consistent lowering of systolic blood pressure distributions from 1960 to 2010 in the United States. Further, the shifting in blood pressure distributions to the left was associated with the significant reduction in stroke mortality and stroke risks in the population. Hypertension treatment and control was attributed as the greatest factor for population risk reduction and most effective in accelerated blood pressure reduction. While the lowering of blood pressure levels has been recognized as one of the major public health successes of the past 50 years, optimal treatment and control has yet to be obtained. Lloyd-Jones and colleagues, in this issue of the Journal of the American Heart Association, provide a valuable assessment of cardiovascular events and the level of blood pressure with implications for improved hypertension control and risk reduction. Specifically, the investigator team has advocated for a multiple risk factor assessment and profile for the treatment of elevated blood pressure to maximize cardiovascular disease risks.

This report is timely and contributes to the evidence gap essential in the development of strategies, clinical guidelines, and interventions for elevated blood pressure. In particular, the consideration and assessment of multiple risk factors has become a valuable clinical component in the management of high blood pressure. Specifically, the risk of cardiovascular disease increase with the number of risk factors and comorbid conditions. Likewise, treatment effects of from antihypertensive agents vary by the levels of risks and comorbid conditions. These differences in risks and benefits are associated with therapy regimens that are specific to multiple factors and comorbid conditions. Complicating the recommendations of high blood pressure treatment based on risks is the variation in level of risks by population demographics including race, sex, age, and geography. The significant differences in risk profiles for blood pressure levels by race has implications for target blood pressure levels, blood pressure treatment initiation levels, types of therapy, and treatment intensity.

The incorporation of risk assessment in the hypertension treatment and control efforts has implications for the clinical treatment guidelines of high blood pressure. The evolution and modifications of the guidelines and recommendations for prevention, detection, treatment, and control of high blood pressure over the past 5 decades have been associated with lower blood pressure distributions and reduced cardiovascular disease risks. The updates and modifications of the clinical guidelines have been based on ongoing study results and findings providing evidence for inclusion in recommendations. Current hypertension guidelines have incorporated systematic reviews to produce evidence-based guidelines. The evidence-grading process has become the major component and activity for the development of clinical guidelines for the management of hypertension, as seen in the recent recommendations. However, there are significant evidence gaps in the risks associated with blood pressure levels with different populations, multiple risk factors, and comorbid conditions. Such variations have led to guidelines...
specific to the risk differential addressing specific characteristics, such as those associated with the treatment of hypertension in patients with ischemic heart disease. Current guidelines propose different blood pressure target levels, blood pressure values for initiating therapy, and different therapy regimens for the clinical management of hypertension based on the risks and comorbid conditions. However, the lack of clinical study evidence for the multiple stratifications of risks and corresponding treatment strategies have led to differences in recommendations. The lack of information leads to confusion and lack of consistency in the management of high blood pressure and subsequent risk benefit.

As high blood pressure prevention, management, and control continue to emerge and develop globally, the issues of hypertension risk management will be a major consideration for clinicians throughout the world. The World Hypertension League has identified the future needs and essential study evidence for the development of high blood pressure control strategies for the diverse populations with various risk levels. The current article contributes to the evidence gap in refining the risks for elevated blood pressure and proposing a mechanism to improve hypertension management by supplementing risk assessment with blood pressure measurements. These results provide a guide for future studies to provide evidence for the diverse hypertensive populations of the world.

Disclosures
None.

References

Key Words: Editorials • guideline • high blood pressure • hypertension • risk score • risk stratification

DOI: 10.1161/JAHA.115.002517
Targeting Multivariable Risks: An Opportunity for Population High Blood Pressure Control
Daniel T. Lackland

*J Am Heart Assoc.* 2015;4:e002517; originally published September 21, 2015;
doi: 10.1161/JAHA.115.002517
The *Journal of the American Heart Association* is published by the American Heart Association, 7272 Greenville Avenue,
Dallas, TX 75231
Online ISSN: 2047-9980

The online version of this article, along with updated information and services, is located on the World Wide Web at:
[http://jaha.ahajournals.org/content/4/9/e002517](http://jaha.ahajournals.org/content/4/9/e002517)