Hypertension in India
Changwei Li and Tanika N. Kelly

Hypertension is a leading public health challenge globally due to its high prevalence and related morbidity and mortality [1–3]. An estimated 978 million adults, or 28% of the world’s adult population, had uncontrolled hypertension in 2008 [3]. More alarming, conservative estimates indicate that the global burden of hypertension will increase to more than 1.56 billion by 2025 [1]. As the most important modifiable risk factor for cardiovascular disease and all-cause mortality, high blood pressure was responsible for approximately 7.6 million deaths globally, or 13.5% of all deaths, in 2001 [1–3].

Although the prevalence of hypertension is generally higher in economically developed countries, due to larger population sizes, the absolute number of individuals with hypertension is higher in developing regions of the world. Kearney et al. [1] estimated that 639 million hypertensive patients reside in economically developing countries compared with only 333 million in economically developed regions of the world. Hypertension has also emerged as a leading risk factor for morbidity and mortality in developing regions, responsible for over 6 million deaths in low and middle-income nations in 2001 [2]. The disease burden resulting from hypertension translates into a substantial economic toll. For example, in China, the estimated annual direct medical costs of chronic diseases caused by or related to hypertension were approximately 3 billion dollars in 2003 [4]. In Brazil, the costs of direct treatment and productivity losses were as high as 72 billion dollars in 2005 [4]. Furthermore, it is likely that the negative health and economic consequences of hypertension will only increase over time in low and middle-income countries where disease patterns continue to shift from communicable to noncommunicable conditions [5].

As the leading modifiable risk factor for cardiovascular disease and mortality [6,7], quantification of the absolute burden and distribution of hypertension in developing nations is critical. Such information will aid in the appropriate allocation of healthcare resources and the development of targeted strategies for disease prevention. Substantial efforts have already been made to estimate the distribution and determinants of hypertension in developing nations such as China, Vietnam, Malaysia, Thailand and Egypt [8–13]. However, very few studies have been conducted to estimate the national and regional prevalence of hypertension in India, the second largest country in the world [1,14]. Kearney et al. [1] estimated a national prevalence of approximately 20% among Indian adults in 2000. However, these estimates were derived from a very limited number of regional studies. Furthermore, since this time, India has experienced rapid economic development and urbanization. The dietary pattern and lifestyles in India have dramatically changed. Specifically, Indians consume more fat, meat products and salt, less complex carbohydrates, fruits and vegetables, and engage in lower amounts of physical activity [15,16]. Given the rapid epidemiologic transition that India is undergoing, updated estimates of hypertension prevalence are needed to understand the country’s quickly changing cardiovascular risk profile.

In this month’s Journal of Hypertension, Anchala et al. [17] report findings from their meta-analysis of population-based studies on the prevalence, awareness, treatment and control of hypertension in India. They reported an overall hypertension prevalence of 29.8%, indicating that as many as 578.5 million Indian adults may suffer from hypertension. Although not directly comparable, these data suggest a substantial increase in hypertension prevalence since the year 2000 estimates of 20% [1]. These estimates are very similar to the current hypertension prevalence estimates from high-middle-income countries such as China (33.7%) and high-income countries such as the United States (29.0%) [9,18], but higher than other low-middle-income nations such as Vietnam (25.1%) [10].

Anchala et al. [17] are also the first to provide hypertension prevalence estimates according to urbanization status and region in India. In this report, the prevalence of hypertension was 14.5 and 28.8% in rural and urban North India, respectively; 31.7 and 34.5% in rural and urban East India, respectively; 18.1 and 35.8% in rural and urban West India, respectively; and 21.1 and 31.8% in rural and urban South India, respectively. Overall, the prevalence of hypertension was significantly higher in urban than in rural regions (33.8 vs. 27.6%, respectively). The higher burden of hypertension experienced in urban...
vs. rural areas is similar to that of other low–middle-income nations. For example, in Vietnam, the prevalence in rural and urban areas is 17.3 and 32.7% [9,10], respectively. This pattern is distinct from that of higher income countries, where hypertension prevalence tends to be higher in rural than in urban areas [19].

The overall rates of hypertension awareness, treatment and control of blood pressure were 25, 25 and 11%, respectively, for rural Indians; and 42, 38 and 20%, respectively, for urban Indians. Although these findings are consistent with those reported from other low and middle-income nations [9], they are generally lower than those of high-income countries [19]. For example, in the United States, the prevalence of hypertension awareness, treatment and control was reported as 80.7, 72.5 and 18.6%, respectively, in 2007–2008 [18]. These findings indicate that better strategies for the detection and control of hypertension are urgently needed in India.

Anchala et al. [17] also reported that age, alcohol consumption, smoking and chewing tobacco, BMI, central obesity, low intakes of dietary fruits and vegetables, high intakes of dietary fat and salt, and sedentary activity were significant risk factors for hypertension in India. These risk factors are consistent with findings from etiologic and interventional studies reported extensively worldwide [20–24]. Lifestyle intervention strategies, such as sodium reduction and weight loss [25], could aid in the primary prevention of hypertension in this population.

The current study by Anchala et al. [17] is important because it provides updated estimates of the national burden of hypertension in India and is the first study to present estimates of hypertension according to region and urbanization status. These data should aid in the development of interventional programmes to prevent, treat and control hypertension in India at both national and regional levels. However, certain limitations should be discussed. Due to the limited number of studies reporting age and sex-specific estimates of hypertension, prevalence according to these subgroups could not be estimated. Such information would allow for more standardized comparisons of prevalence across regions within India and for the identification of high-risk subgroups who may benefit most from targeted prevention and treatment efforts. Moreover, there were limited studies that only covered small areas of some regions. For example, there were only two studies reporting prevalence of hypertension from very limited areas of Gujarat and Rajasthan in rural, West India [20,27]. Whether these estimates can be pooled and generalized to represent prevalence in all of rural, West India is questionable. Finally, although the authors report using only population-based studies, two studies appear to include only patient populations [28,29]. For example, one study, conducted in a rural area of East India, used consecutive individuals of remote clinics and excluded patients taking antihypertension medication. It is unlikely that estimates from this study accurately reflect true hypertension prevalence in this region [28]. Therefore, generalizing these findings to the entire population of rural East India may not be appropriate.

In conclusion, Anchala et al. [17] provide an important update on national hypertension prevalence as well as first time estimates of hypertension according to urbanization status and region. Although these findings provide critically needed information on the country’s cardiovascular risk profile, the results must be interpreted with caution due to potential issues related to the generalizability of their pooled estimates to the region and nation. Furthermore, information on hypertension according to age, sex and other relevant subgroups are still needed to facilitate the development of targeted strategies for hypertension prevention, treatment and control throughout India. Future large-scale nationally representative surveys could help to clarify these issues and, ultimately, aid substantially in the effort to curtail the rising epidemic of cardiovascular disease in India.

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Conflicts of interest

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REFERENCES


