Screening for Hypertension in Asymptomatic Individuals in India: An Expert Consensus Statement

Jamsheed Dalal1, KK Sethi2, Santanu Guha3, Saumitra Ray4, PK Deb5, Ashok Kirpalani6, Srinivasa Rao Maddury7, Immaneni Sathyamurthy8, Siddharth Shah9, Mrinal Kanti Das10, HB Chandalia11, JPS Sawnhney12, Joy Thomas13, Viveka Kumar14, Nishith Chandra15, Aziz Khan16, A Sreenivas Kumar17, G Suryaprakash18

Abstract

Introduction: Hypertension (HTN) is a rapidly growing epidemic in India. It is no longer restricted to older adults as more young Indians are being diagnosed with HTN. Despite its significant prevalence, the awareness, treatment, and control of HTN remain low in India. Thus, early diagnosis is essential to control HTN and prevent future complications. Screening for HTN can help identify undiagnosed and asymptomatic HTN, and thereby the early use of interventions to control the blood pressure (BP). However, no comprehensive guidelines have been established for effective HTN screening in asymptomatic individuals in an Indian setting.

Objective: To provide consensus recommendations for hypertension screening in India

Consensus recommendations: Screening for HTN can provide more effective control of HTN and reduce the complications. Experts recommended that the initial age at screening should be 18 years. In individuals at a high risk of HTN, targeted screening can be undertaken. BP measurement using an electronic BP recorder (with at least two readings) are required for identifying HTN during screening. In asymptomatic adults with BP <130/85 mmHg and BP of 130–139/85–89 mmHg, rescreening should be conducted every 3–5 years and at least every year, respectively. Screening for HTN can be cost effective even when universal screening of the entire population is undertaken.

Conclusion: The consensus recommendations would increase the awareness of HTN screening. Screening for HTN can provide more effective control of HTN and reduce the complications.

Introduction

Hypertension (HTN), a major cardiovascular (CV) risk factor, affects millions of individuals globally. A linear relationship has been reported between blood pressure (BP) and adverse CV outcomes. Although HTN manifests with diverse symptoms, such as headache, dizziness, shortness of breath, and palpitations, most HTN patients remain asymptomatic and are diagnosed incidentally. Occasionally, asymptomatic HTN may be severe enough to be declared as a hypertensive emergency and is seen in adults as well as in school children. Thus, screening of HTN is necessary across all age groups.

In India, HTN prevalence is colossal. Recent evidence indicates HTN prevalence of 25.3% in India. This necessitates screening for HTN in asymptomatic adults. The Ministry of Health and Family Welfare (MOHFW) of India has undertaken a project for HTN, diabetes, and cancer screening in individuals aged 30 years and above. However, this age cut-off excludes adults aged 18–30 years from screening. Conducting screening in this age group is essential as increasing prevalence of HTN individuals below 30 years has been reported. Additionally, other aspects of HTN screening like the rescreening interval remain unclear. Therefore, to guide the screening of individuals for HTN in India, a group of experts involved in HTN management provided their opinions to develop a unified consensus. This paper elucidates the consensus recommendations from 94 experts, which can guide healthcare professionals for performing effective HTN screening in asymptomatic individuals.

Need for a consensus

In India, there is an immense need to reduce increasing prevalence of HTN. However, HTN awareness, treatment, and control remain low. Increasing awareness can improve the control of HTN. Furthermore, the increasing prevalence of HTN in young adults (<40 years) and in school children (6–16 years) mandates early interventions in this age group to derive long-term benefits. Thus, to identify undiagnosed and asymptomatic HTN

1Director, Centre for Cardiac Sciences, Kokilaben Dhirubhai Ambani Hospital, Mumbai, Maharashtra; 2Delhi Heart & Lung Institute, Panchsheel Park, New Delhi; 3Calcutta Medical College, Kolkata, West Bengal; 4Ramakrishna Mission Seva Pratishthan and Vivekananda Institute of Medical Sciences, Kolkata, West Bengal; 5E.S.I. Post-graduate Institute of Medical Science and Research, Kolkata, West Bengal; 6Bombay Hospital, Mumbai, Maharashtra; 7Senior Consultant, Department of Cardiology, Care Hospitals, Hyderabad, Telangana; 8Dept of Cardiology, Apollo Hospitals, Chennai, Tamil Nadu; 9Raheja Hospital, Mumbai, Maharashtra; 10Calcutta Medical Research Institute, Kolkata, West Bengal; 11Jaslok Hospital and Research Centre, Mumbai, Maharashtra; 12Dept. of Cardiology, Sir Ganga Ram Hospital, New Delhi; 13Dr. Joy Thomas Heart Care, Bhandari Salu, Mupappar West, Chennai, Tamil Nadu; 14Consultant Cardiologist, Max Hospital, Saket, New Delhi; 15Consultant Cardiologist, Fortis Escorts Hospital, New Delhi; 16Crescent Hospital & Heart Centre, Dhanori, Nagpur, Maharashtra; 17Apollo Hospital, Hyderabad, Telangana; 18Care Hospital, Hyderabad, Telangana

Received: 29.05.2019; Accepted: 28.12.2019
and to increase its awareness in general population, screening is of utmost importance. In the Indian setting, no guidelines or recommendations have been established for the effective screening of HTN. This document provides a unified nationwide approach for screening HTN in asymptomatic individuals.

Expert panel

A core group of experts conceptualised that a consensus should be developed when an initial literature search revealed that there are no standard guidelines or recommendations for screening HTN suitable to the current scenario in India. To advance the concept of HTN screening, the core group identified other experts across the country from specialties including cardiology, nephrology, endocrinology, and internal medicine. Each expert had clinical experience of more than 10 years in HTN diagnosis and treatment. Overall, 94 experts participated in six round table meetings conducted across the country and provided their recommendations on specific consensus statements.

Approach to consensus development

Initially, the expert panellists discussed the approach to and methodology for consensus development. The 2018 guidelines on management of HTN from the European Society of Cardiology and European Society of Hypertension (ESC/ESH) were referred to when deciding key questions/statements. Moreover, the guidelines of the American College of Cardiology and American Heart Association (ACC-AHA) were reviewed. In total, seven key areas were identified as requiring discussion for providing consensus recommendations.

For accepting or refuting the consensus on the seven key recommendations, a mix of Delphi and Child Health and Nutrition Research Initiative (CHNRI) methods was adopted. In the Delphi method scoring is conducted using the Likert scale, ranging from 1 to 9. The CHNRI method was developed to address research gaps in existing priority methods. However, no method is complete, and more satisfactory results can be achieved using a combination of several methods to address research gaps in an appropriate manner. The scoring system of these methods assists in unified decision-making and consensus development. The use of a hybrid method is simple, inclusive, and replicable and ensures a systematic and transparent process. As recommended in the CHNRI method, all the experts contributing to the consensus had expertise in HTN management. The key questions were formulated based on the criteria of answerability, effectiveness, potential for translation to clinical practice, novelty, and potential impact on the healthcare burden.

All the key statements and relevant literature were shared with all expert panel members before the meetings to form informed opinions. During each meeting, two experts moderated the discussion by highlighting the key questions along with supporting evidence. After discussing each key question, the experts provided their opinion which was scored on a Likert scale ranging from 1 to 9. A mean score was calculated after voting by all the experts. A consensus statement was accepted if a mean score of 7 or higher was obtained from voting of more than two-thirds (66.6%) of the experts for each key statement. The consensus development process is summarised in Figure 1. The manuscript draft incorporating all the consensus statements was sent to all the experts who provided their comments. The final draft of the manuscript was reviewed, edited, and finalised by the core group experts.

Consensus recommendations

A discussion of the consensus recommendations from the expert panel is provided in following sections. Table 1 summarises all the expert recommendations and presents their mean scores on the Likert scale.

1. Is screening for HTN in asymptomatic adults necessary?

HTN is a growing epidemic in India. In a meta-analysis, Anchala et al. reported an overall prevalence of 30% and the prevalence rates of 33%-35% and 16%-33% in urban and rural settings, respectively. A study conducted in New Delhi reported significantly increasing trends for HTN. The authors of that study reported results from two surveys conducted at a 20-year interval (1991–1994 and 2010–2012); they found that the prevalence of HTN significantly increased from 23.0% to 42.2% in urban settings and from 11.2% to 28.9% in rural settings. Similar increments were reported in pre-hypertension (Pre-HTN). Further, the highest rate of HTN increase was found in the youngest age group (35–44 years), with odds ratios (ORs) of 5.0 and 2.7 in urban and rural populations, respectively. These results suggest the increasing prevalence of both pre-HTN and HTN in young individuals and has also been supported by multiple studies in India. Additionally, most adults remain unaware of their HTN. In adults aged above 18 years, a prevalence of 26% for undiagnosed HTN has been reported. Lower awareness has
Table 1: Final consensus recommendations

<table>
<thead>
<tr>
<th>SN Key question</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Screening for HTN in asymptomatic adults is necessary in India</td>
<td>8.7</td>
</tr>
<tr>
<td>2. Active screening for HTN can reduce the community burden of HTN and its complications</td>
<td>8.4</td>
</tr>
<tr>
<td>3. Appropriate age to initiate HTN screening should be ≥18 years</td>
<td>7.8</td>
</tr>
<tr>
<td>4. Targeted screening required in high-risk individuals</td>
<td>7.8</td>
</tr>
<tr>
<td>5a. Electronic BP recorder should be used for measuring BP during screening</td>
<td>8.2</td>
</tr>
<tr>
<td>5b. At least two BP readings are essential to identify HTN during screening</td>
<td>8.3</td>
</tr>
<tr>
<td>6a. In asymptomatic adults with BP &lt;130/85 mmHg, rescreening should be conducted every 3–5 years.</td>
<td>7.1</td>
</tr>
<tr>
<td>6b. In asymptomatic adults with BP 130–139/85–89 mmHg, rescreening should be conducted annually at least.</td>
<td>7.2</td>
</tr>
<tr>
<td>7. Universal screening for HTN targeting the entire population can be cost effective even in resource-limited settings</td>
<td>7.7</td>
</tr>
</tbody>
</table>

resulted in lower HTN treatment seeking behaviour, thereby contributing to the lower rates of HTN control. Thus, the increasing prevalence of HTN and pre-HTN, especially in young individuals, demands the careful screening of the entire population for the early detection of HTN. Screening for HTN is advocated globally by various organisations, including the World Health Organization, the World Hypertension League, and the MOHFW of India. Although screening has been recommended, the actual Indian population undergoing HTN screening remains unclear, which is in contrast to Thailand with a population coverage rate of 54.6% under HTN screening. Therefore, screening for HTN in the Indian asymptomatic adult population is urgently required. Voting from the 94 experts provided a mean score of 8.7, favouring the need for screening for HTN.

- Recommendation: Screening for HTN in asymptomatic adults is necessary in India.

2. Would active screening reduce HTN development and its associated complications and reduce the community healthcare burden?

Recently, the SPRINT trial provided evidence that reducing systolic BP intensively to a target of 120 mmHg was associated with lower rates of fatal and nonfatal major CV events and death from any cause. Some researchers question the methodology of the SPRINT trial, because BP was measured in the absence of a doctor or nurse. Nonetheless, the benefits of reducing BP to <140/90 mmHg are well established. However, scarce evidence has been provided for the benefits of screening. Population screening for abdominal aortic aneurysm, peripheral arterial disease, and HTN in Danish men (65–74 years) was associated with lower mortality rates than non-screening. In a study from Canada, 39 mid-sized communities in Ontario with residents aged 65 years and above were evaluated. Twenty communities received the intervention of Cardiovascular Health Awareness Program (CHAP), whereas 19 communities did not. Over 12-month follow-up, there was a 9% reduction in the relative risk of the composite end-point of hospital admissions for acute myocardial infarction, stroke, and congestive heart failure. This translated to 3.02 fewer hospital admissions for CV disease annually per 1000 persons. Another community-wide programme in the rural county of Maine was provided to individuals as a part of CV Disease Prevention Programs and Health Outcomes. Among adults (>150,000) aged above 40 years, there was an absolute increase of 24.7% in HTN control from 18.3% in 1970 to 43.0% in 2010. This resulted in less than expected hospitalisations per capita, and the adjusted mortality was lower than predicted mortality, with decreases from 60.4 deaths per lakh population in 1970–1989 to 41.6 deaths per lakh population in 1990–2010. These findings suggest that screening is beneficial for improving HTN control and reducing the adverse CV outcomes in a community. However, the experts observed that the population included in these studies was in the middle-to-old age range. Therefore, some of the experts discussed whether screening younger individuals will translate to similar benefits. However, the panel members agreed that if screening is initiated at a young age, early interventions can be undertaken to improve the control of risk factors and reduce adverse outcomes. Moreover, the early detection of pre-HTN and elevated BP would enable early interventions to be implemented to reduce development of HTN and its complications. This would translate to the reduction of the community healthcare burden. From the voting of 91 experts, a mean score of 8.4 was obtained in favour of the consensus.

- Recommendation: Active screening for HTN has the potential to reduce the community burden of HTN and its associated complications.

3. At what age should screening be initiated?

Age is a known risk factor for HTN. It has been reported that after the age of 69 years, the prevalence of HTN increases to 50%. However, over the past few years, the declining age for HTN development and the identification of additional risk factors have raised many concerns. Urbanisation, especially in semi-urban areas, and increasing obesity were important factors identified in a study from Peru and India. In such scenario, self-screening of HTN is an effective alternative for detecting new HTN cases. Self-screening has been found to result in similar rates of HTN detection compared to other methods, but a low referral to primary care is a concern. In Indian context, increasing HTN prevalence in younger individuals coupled with low awareness makes the HTN screening essential. The age at screening is therefore an important aspect in the HTN management algorithm. For the initial age of screening, the US Preventive Task Force recommends the age of 18 years and above, whereas the MOHFW of India recommends age ≥30 years. In addition, uncertainty is observed in the initial age at screening for HTN in various recent studies conducted in India and internationally (Table 2). Given these differences in the initial age at screening, the expert panel considered this as one of
the most important issues in HTN management.

Some experts argued that the age at screening should not be too low (such as 18 years) as HTN detection at this age would require a larger population to be screened. Some experts also pointed out that there may be operational difficulties when mass population screening is planned. Other experts opined that not considering lower ages in screening would exclude the vulnerable population of the younger age group. Retrospective analysis of data of the adults aged above 20 years from a mass gathering of the Simhastha Kumbh Mela in 2015 from Balsari et al. clears some of these doubts. It was reported that 33.6% (n = 1783/5760) of adults screened positive for HTN based on a single reading taken using an electronic BP recorder. Among these positive individuals, 27.4% (n = 1580/5760) were unaware of their HTN.8 Therefore, even at mass gatherings, lower ages can be considered for HTN screening. Recent studies from India identified that in apparently healthy school going children and adolescents aged 5 to 15 years, prevalence of HTN ranges from 3% to 25%.12,13 Therefore, screening should be considered at the earliest ages (i.e., when they enter adulthood). The final consensus was that screening should be started from the age of 18 years and above (score: 7.8, n = 74). This falls in line with the recommendation of the US task force and is also supported by studies that incorporated the age of 18 years and above for screening HTN.

- Recommendation: Age of 18 years and above is an appropriate age to initiate screening for HTN.

4. Is targeted screening required in high-risk individuals?

In the absence of HTN, some individuals may be at a higher risk of HTN than the general population. These individuals may harbour one or more risk factors including obesity, family history of HTN (FH-HTN), and diabetes. If these risk factors are present, individuals should be screened for HTN at a clinic or hospital when they undergo follow-up for existing illnesses. After discussion, important risk factors for inclusion were FH-HTN and obesity.

FH-HTN has been established as a risk factor in several studies. Ranashinge et al. observed a significantly higher prevalence of HTN in individuals (>18 years) with FH-HTN (among parents, grandparents, siblings, and children) than in individuals without it (29.3% vs 24.4%, p < 0.001). FH-HTN was associated with increased risks of HTN (OR: 1.29), obesity (OR: 1.36), and metabolic syndrome (OR: 1.19).39 Another study conducted in China among elderly adults (>60 years) reported a significantly higher prevalence of HTN in the study population with FH-HTN (67.5% vs 47.9%, p < 0.001). When the prevalence of HTN was assessed based on the generations affected, a graded association was found between HTN and FH-HTN, with 63.2% having HTN when the FH-HTN included a first-degree relative with HTN and 79.1% having HTN when the FH-HTN included a second-degree relative with HTN.41 Goldstein et al. demonstrated that in individuals aged 22–50 years undergoing 24-hour ambulatory BP measurement, the prevalence of elevated BP tended to be higher in men but not in women when both parents had HTN.42 However, such gender variation may not be observed when a large population is screened. These results suggest that individuals with FH-HTN should undergo targeted screening.

Obesity is an established risk factor for HTN. However, it remains unclear whether being obese or overweight at an early age influences HTN development and how long the development process takes. The John Hopkins Precursors study in 1132 men with a mean age of 23.1 years, BMI of 23.1 kg/m², and 46 years of follow-up observed that the prevalence rates of HTN increased with increasing age (0.3% at 25 years, 6.5% at 45 years, and 37% at 65 years). Being overweight and obese was associated a 1.5-times and 4-times increased risk of HTN respectively.40 Further confirmatory evidence was provided by the Framingham Heart Study involving 4200 men and 5645 women. Among adults aged ≥18 years (mean age at analysis: 52.1 years), a 5% increase in weight over a 4-year duration (~4 kg in men and 3 kg in women) increased the odds of HTN by 20%–30%.43 Thus, even a modest weight gain in early life is associated with a future risk of HTN necessitating targeted screening in such individuals.

Some panel members suggested that screening for HTN should be conducted in shift workers. A higher prevalence of HTN has been observed in shift workers.45,46 In addition, longer work hours are associated with a higher risk of HTN.47 Some experts also suggested that other family members of patients with HTN should undergo screening.

When discussing this aspect, few experts opined that there is no need of such targeted screening and suggested that all such individuals should undergo routine screening similar to the general population or when they accompany a family member during consultation. However, voting (n=78) revealed a mean score of 7.8, favouring the need of targeted screening in high-risk individuals.

- Recommendation: In adults with established risk factors such as diabetes, dyslipidaemia, and albuminuria, immediate screening for HTN at clinic or hospital settings should be undertaken. In individuals with FH-HTN, who are obese/overweight and those who are gaining weight, targeted screening is necessary to detect HTN at early stages.

5. What should be the approach to screening?

Screening can be performed in any setting, including community halls, workplace, clinic, hospital, mass gatherings, and shopping malls. Thus, no person should be excluded from screening for HTN because of the setting or place of screening. BP can be taken in any arm (right or left) and in the seated position with the arm and back supported. The cuff size
should be adequate, and clothing should be minimal. Individuals should be asked to empty their bladder before recording the BP. Measurement should be conducted in a quite environment, and talking by the patient should be avoided during BP measurement. Screening for HTN at large gatherings (mass screening) provides an opportunity to identify undiagnosed HTN in a short span of time. Places such as supermarkets, institutions, hospitals, schools, and workplaces may be suitable for such screening. Door-to-door opportunistic screening has also been found to be feasible in the Indian setting. Additionally, assessing the BP of individual patients who visit physicians’ clinic for other reasons is a golden opportunity. By understanding the potential hazards of HTN, healthcare professionals such as dentists can also contribute towards HTN screening.

When the experts considered the approach to BP measurement, the instrument used for BP measurement was one of their main concerns. In India, even today, most healthcare professionals use the aneroid apparatus or mercury sphygmomanometer for recording BP. However, the experts opined that electronic BP recorders are more feasible and provide results with much less assistance and without the need of expertise. They opined that the mercury sphygmomanometer should be avoided, except when in situations where an electronic BP recorder is unavailable. They pointed that aneroid-based manual BP recording requires expertise and appropriate calibration occasionally. Moreover, the MOHFW of India advises yearly screening for individuals with HTN. Although the ideal rescreening interval is uncertain, it is determined by two parameters—age at screening and initial BP levels. It has been observed that the mean incidence of HTN increases with the increasing rescreening interval, and the mean incidence varies from 2.5% at 1 year to 7.7% at 2 years, 14.2% at 3 years, 12.4% at 4 years, and 13.8% at 5 years. This is expected as the number of patients developing HTN by 5 years is more than those developing HTN at 1 or 2 years of follow-up. However, a prolonged waiting period after the initial screening may lead to the non-detection of HTN in those who developed it early after the first screening. The US Preventive Task Force has advised yearly screening in adults above 40 years of age. In those aged 18–39 years with BP values <130/85 mmHg, rescreening every 3–5 years is advised. Recent ACC/AHA guidelines for HTN recommend that in adults aged above 18 years with BP 120–129/80 mmHg, rescreening is advised in 3–6 months. In those with stage 1 HTN (130–139/80–89 mmHg) with <10% risk of atherosclerotic CV disease, rescreening is advised every 3–6 months. However, the 2018 ESC/ESH guidelines suggest repeat BP measurements every 3–5 years in individuals with BP <130/85 mmHg and at least annually in those with BP of 130–139/85–89 mmHg. Based on this suggestion, the experts were asked to opine on two main questions. First, regarding rescreening in asymptomatic individuals aged 18 years and above who have BP <130/85. 63 voted for a 3–5-year interval providing a score of 7.1. Thus, the final consensus was that rescreening should be conducted every 3–5 years in the adult population with BP <130/85 mmHg. Regarding rescreening in asymptomatic individuals with BP of 130–139/85–89, 86 experts voted for a yearly interval (score: 7.2); thus, rescreening of these individuals should be conducted every year.

### Table 7: Hypertension screening studies that considered the age of inclusion

<table>
<thead>
<tr>
<th>Study (year)</th>
<th>Country</th>
<th>Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patel et al. (2010)46</td>
<td>US</td>
<td>&lt;45, 45–64, &gt;64</td>
</tr>
<tr>
<td>Pastakia et al. (2013)47</td>
<td>Kenya</td>
<td>&gt;18</td>
</tr>
<tr>
<td>Zallaman et al. (2013)48</td>
<td>US</td>
<td>&gt;18</td>
</tr>
<tr>
<td>Saqlain et al. (2017)49</td>
<td>Pakistan</td>
<td>16–30</td>
</tr>
<tr>
<td>Elaziz et al. (2014)50</td>
<td>Egypt</td>
<td>&gt;18</td>
</tr>
<tr>
<td>Ranasinghe et al. (2015)51</td>
<td>Sri Lanka</td>
<td>18</td>
</tr>
<tr>
<td>Selvavinayagam (2017)52</td>
<td>India</td>
<td>&gt;30</td>
</tr>
<tr>
<td>Balsari et al. (2017)53</td>
<td>India</td>
<td>&gt;20</td>
</tr>
</tbody>
</table>
Recommendation:
Universal in cardiovascular outcomes and screening, benefits in terms of evidence in screening for hypertension in various aspects like age to initiate screening, benefits in terms of blood pressure control or reduction in cardiovascular outcomes and appropriate rescreening and its cost-effectiveness. The limitation is that recommendations are based on expert opinions which need to be evaluated further in large controlled studies.

Conclusion
The prevalence of HTN in the general population, including adults and adolescents, is increasing. The increased incidence of CV disease, leading to higher morbidity and mortality, is a major threat to the community. In the current scenario, the diagnosis of HTN is limited to only clinic or hospital settings. Only a limited number of individuals from the general population are being screened and diagnosed with HTN. Appropriate screening of a large population is therefore necessary to identify undiagnosed HTN for implementing early interventions to reduce HTN-related healthcare burden in the community. The initial age at screening should be 18 years. Moreover, rescreening based on age and current BP levels should be appropriately and adequately performed as suggested. The aforementioned measures are expected to translate into improved health outcomes and appropriate treatment and control of HTN, thereby reducing the incidence of adverse CV outcomes. Screening for HTN in asymptomatic adults in the community is cost effective compared with no screening and should therefore be adequately and appropriately implemented by all the stakeholders providing healthcare.

Strengths and Limitations
Screening for hypertension is important but often not actively persuaded especially in developing countries. In absence of specific guidelines on screening hypertension in India, the expert recommendations provide opportunity for unified approach to screening of hypertension in asymptomatic individuals. This consensus will stimulate further research in establishing concrete evidence in screening for hypertension on various aspects like age to initiate screening, benefits in terms of blood pressure control or reduction in cardiovascular outcomes and

7. Is screening for HTN cost effective in resource-poor settings?
Analysing the cost effectiveness helps identify neglected opportunities by highlighting interventions that are relatively inexpensive yet have the potential to reduce the disease burden substantially. Determining the cost effectiveness of HTN screening in the Indian setting is important because of the growing population size and the significant prevalence of diagnosed and undiagnosed HTN in the general population. In resource-limited settings, determining cost effectiveness is more important. A recent study in Bhutan reported that expanding from opportunistic screening (70% of the target population) to universal screening (100% of the target population) was more cost effective for screening HTN and diabetes.86 Most panel members expressed that enhancing the population coverage in the screening programme may be cost-effective. Some experts believed that the aforementioned rescreening intervals may also be cost-effective. After the experts voted on this key question (n = 92), the calculated score was 7.7 accepting the consensus.

- Recommendation: Universal screening for HTN targeting the entire population may be cost effective even in resource-poor settings.

Acknowledgments
It is our pleasure to acknowledge and thank our colleagues who actively participated in the meetings and provided their opinions on formulating consensus statements. The contributors are listed in the alphabetical order.

Dr A K Bhalla, Delhi; Dr A Nithin, Hyderabad; Dr Achyut Sarkar, Kolkata; Dr Ajay Ajmani, Delhi; Dr Akshay Mehta, Mumbai; Dr Anand Kumar Pandey, Delhi; Dr Anupam Shrivastava, Delhi; Dr Aparna Jaswal, Delhi; Dr Arindam Pande, Kolkata; Dr Arpita Roychowdhury, Kolkata; Dr Arun Mohanty, Kolkata; Dr Asha Mahilmaran, Chennai; Dr Ashok Punjabi, Mumbai; Dr Ashwani Gupta, Delhi; Dr B Vinoth Kumar, Chennai; Dr Bhaskar Shah, Mumbai; Dr Bhavesh Vajifdar, Mumbai; Dr (Col) C P Roy, Delhi; Dr K Damodharan, Chennai; Dr Dayasagar Rao, Hyderabad; Dr Debmalya Sanyal, Kolkata; Dr Deepka Saha, Hyderabad; Dr Dhurjati Prasad Sinha, Kolkata; Dr E A Padma Kumar, Hyderabad; Dr Eric Borges, Mumbai; Dr G Ramesh, Hyderabad; Dr Gaurav Minocha, Delhi; Dr Girish Navasundi, Bangalore; Dr J V Balasubramnian, Chennai; Dr R Jayanthi, Chennai; Dr J S N Murthy, Chennai; Dr K M Suryanarayana, Bangalore; Dr K Anand, Chennai; Dr K K Saxena, Delhi; Dr Kaustubbh Vaidya, Mumbai; Dr K H Srinivasa, Bangalore; Dr Kiron Verghese, Bangalore; Dr K N Srinivasan, Chennai; Dr K S Subramanii, Bangalore; Dr Lanka Krishna, Hyderabad; Dr Latchumanados, Chennai; Dr M K Shah, Mumbai; Dr M S Aditya, Hyderabad; Dr Manoj Mashru, Mumbai; Dr N Sridhar, Bangalore; Dr N C Krishnamani, Delhi; Dr Nagamalleswara, Bangalore; Dr Nagesh Kumar Goyal, Delhi; Dr P Balaji, Chennai; Dr P G Kerkar, Mumbai; Dr P Manokar, Chennai; Dr P A Jiwani, Hyderabad; Dr Pankaj Jariwala, Hyderabad; Dr Prabhakar Koregal, Bangalore; Dr Pranab Kumar Biswas, Kolkata; Dr Prasanna Katti, Bangalore; Dr Puneet Agarwal, Delhi; Dr R C Khokhani, Mumbai; Dr R Keshav, Bangalore; Dr R Balaji, Hyderabad; Dr R R Mantri, Delhi; Dr Rajeev Rath, Delhi; Dr Raman Raj, Kolkata; Dr Ranjan Sharma, Kolkata; Dr Ripen Gupta, Delhi; Dr S Guruprasad, Chennai; Dr S Manoj, Chennai; Dr S S Iyengar, Bangalore; Dr S V K Ramakrishna, Hyderabad; Dr Sadanand Shetty, Mumbai; Dr S Sadanandam, Chennai; Dr Saket Bhardwaj, Delhi; Dr Sanjiv Sharma, Delhi; Dr Sankar Chandra Mondal, Kolkata; Dr T Sasikanth, Hyderabad; Dr Satyam Chakraborty, Kolkata; Dr Shailender Singh, Hyderabad; Dr Shanmugaraj, Chennai; Dr Shiva Kumar Reddy, Hyderabad; Dr Shyam Sundar Reddy, Hyderabad; Dr Subhash Chandra, Delhi; Dr K Subramaniam, Bangalore; Dr Sujeet Jha, Delhi; Dr Sumeet Sethi, Delhi; Dr Soumik Goswami, Kolkata; Dr Soumitra Kumar, Kolkata; Dr Sunil Dwivedi, Bangalore; Dr Sunil Wani, Mumbai; Dr Suvo Banerjee, Kolkata; Dr T R Raghu, Bangalore; Dr Tathagata Ghosh, Kolkata; Dr V S Ramachandra, Hyderabad; Dr Vijay Kumar, Bangalore; Dr Vijay Negalur, Mumbai; Dr Vijay Sai, Bangalore; Dr Vikram Kolhari, Bangalore; Dr Y Shiva Kumar, Hyderabad.

We extend our gratitude and thank medical team of Glenmark pharmaceuticals ltd. Mumbai, India, for their help in literature search, data collation and support in manuscript
writing. Also, we are grateful to assistance from Dr Vijay M Katekhaye (Quest MedPharma consultants, Nagpur, India) in writing, editing and reviewing the manuscript.

Contributors
All the authors contributed to the concept and design of this consensus document. Manuscript draft was developed and critically reviewed by all the authors. All authors have approved the final draft of the manuscript.

Funding
This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Disclaimer
The views expressed are of individual contributors and not of any scientific body or organization.

References