HYPERTENSION IN INDIA: DATA ANALYSIS FROM NATIONAL SURVEYS

Introduction

India is undergoing socioeconomic, nutrition health and epidemiological transitions. Based on the analysis of published data between 1990 to 2016, the India State-Level Disease Burden Initiative (ISLDBI) reported the trends in ongoing epidemiological transition[1,2]. Over-nutrition urbanisation and changes in lifestyle including steep reduction in physical activity are some of the major factors associated with increase in the cardio-vascular disease burden (CVD) burden[3-6]. Over the last three decades there has been a progressive increase in the burden of cardiovascular diseases in India. ISLDBI has reported that there were substantial interstate differences in the ongoing epidemiological transition. Between states, there were nine-fold difference in the DALY rate for ischaemic heart disease and a six-fold difference for stroke. Population-based data for morbidity due to cardiovascular diseases and their sequelae are generally not available for many parts of India, although several ongoing studies are attempting to address this gap. Additional population-level data for the burden of cardiovascular diseases attributable to risk factors in different parts of India would make the disease burden estimates more robust.

The ISLDBI reported the prevalence of high systolic blood pressure, and not diastolic blood pressure. While computing prevalence of hypertension, it is important to take into account both systolic and diastolic blood pressure. In India hypertension and CVDs occur a decade earlier[7]. Prevalence of over-nutrition which is an important risk factor for hypertension is higher in women[8]. Realising the need for obtaining the state and district specific information on prevalence of hypertension Ministry of Health and Family Welfare undertook two large scale population-based surveys: the Clinical Anthropometric and Biochemical Component of the Annual Health Survey (CAB AHS) and the District Level Household Survey 4 (DLHS4). These surveys were carried out between 2013 and 2015 and provide the information on prevalence of hypertension in all adult men and women at district level in all districts of the country. NFI undertook analysis of the raw data from AHS third round and DLHS 4 and assess variation in systolic and diastolic blood pressure and prevalence of hypertension in adults in AHS and DLHS states, urban and rural areas, men and women and in different age groups,

Ready access to state specific data on prevalence of hypertension in relation to state/region, place of residence (urban/rural), sex and nutritional status will enable states to:

- draw up state specific plans for programme implementation (PIP);
- improve effective allocation of economic and human resources;
- improve access to services based on the prevalence of hypertension; and
- accelerate the pace of operationalizing the interventions aimed at prevention and management of hypertension.

Use of these data sets, for focussing intervention on the identified priority areas, monitoring progress and taking up midterm modifications may substantially improve the impact in terms of prevention and management of hypertension. These data can also be used as the baseline

to assess the impact of interventions, implemented with varying content coverage, and quality across states and districts.

Material and methods

In India DLHS 4 and AHS CAB surveys undertaken in 2013-15 have collected information on nutritional status, Hb levels, acute and chronic morbidity, hypertension and diabetes in all major states. AHS CAB and DLHS4 undertook the assessment of nutritional and health status of all the members of the selected households. Hence it is possible to compare the prevalence of hypertension across age groups and nutritional status groups from the same household residing in AHS or DLHS states, in urban and rural areas.

In both these surveys data collection was done by trained health paraprofessional personnel. Prior to initiation of the survey all the para-professionals recruited by various agencies were trained in undertaking measurement of height, weight, measuring blood pressure using digital blood pressure monitor. Only those personnel who had acquired the required accuracy in measurements conducted the survey. All equipment for the survey were centrally procured and tested for accuracy before being sent to the survey agencies. After the person was sitting quietly for about ten minutes BP measurements were taken twice five minutes apart. As a quality assurance measure duplicate measurement of height, weight BP were done in 10 % of the persons surveyed.

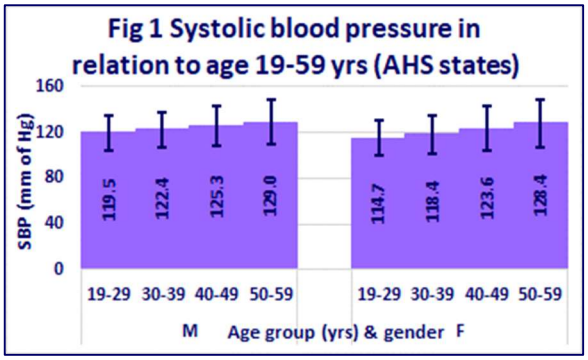
Raw data from the AHS and DLHS 4 were analysed using SPSS 26. Means and standard deviations of systolic and diastolic BP were computed in different groups. The findings from this part of the analysis are presented in the present report.

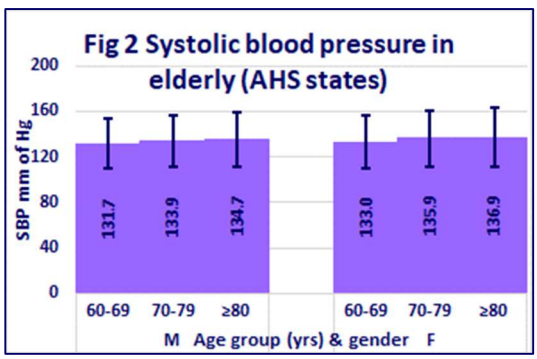
Prevalence of hypertension is being computed in AHS and DLSHS 4 states, in urban and rural areas, in men and women and in relation to nutritional status of the persons and will be presented in the next report.

Results

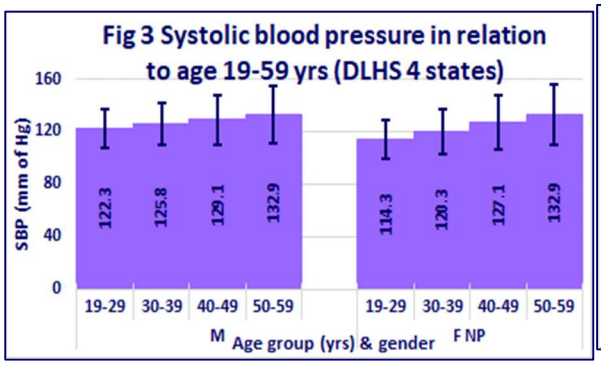
Systolic and diastolic pressure in AHS and DLHS 4 states

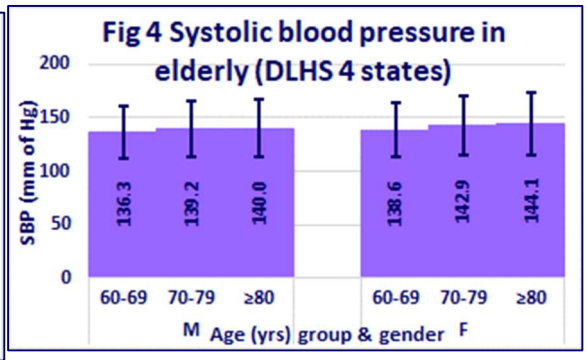
Changes in mean systolic blood pressure in AHS and DLHS 4 states in men and women



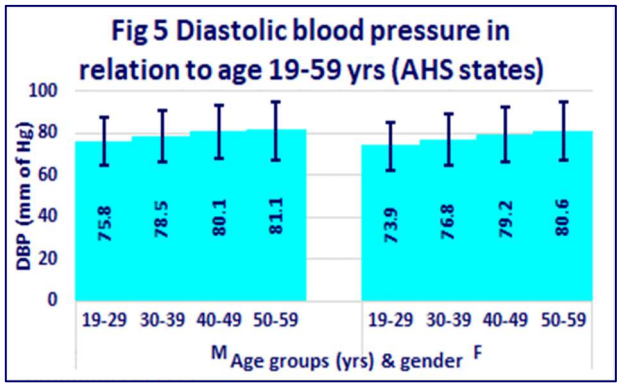


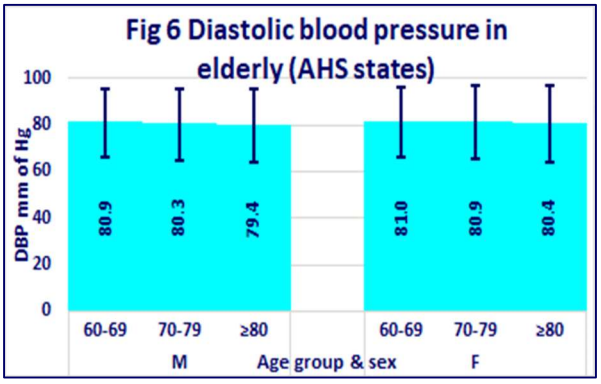
between 18-59 years of age and among the elderly is shown in Figs 1-4.

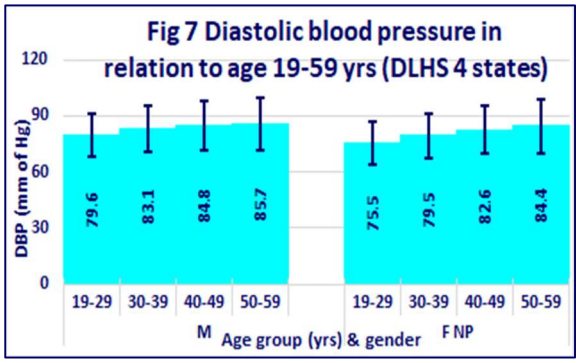


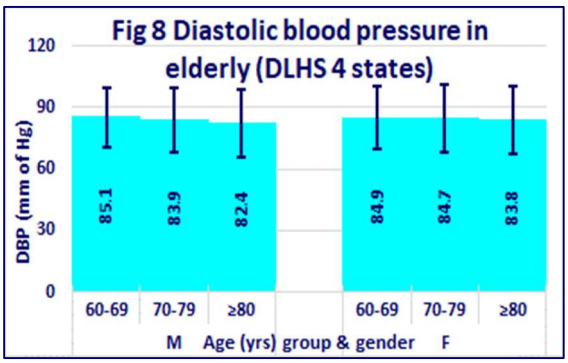


There was a progressive increase in the mean systolic blood pressure both in men and women with increasing age across decades from 19 years onwards. The magnitude of the increase in the 40 to 59 year age group as compared to younger or older age groups. There was a relatively small increase in the blood pressure in the men and women beyond 60 years; this might partly be due to a larger number having been detected and being under treatment. The fact that the persons with more severe hypertension may have succumbed to cardiovascular and/or cerebrovascular diseases may also account in part to the lower rise in mean blood pressure among the elderly. The mean systolic blood pressure was lower in women as compared to men in the age groups 19-59 years. Among the elderly mean systolic blood pressure was marginally higher in women as compared to men. The mean systolic pressure across all age groups were lower in AHS states as compared to DLHS4 states both in men and in women.







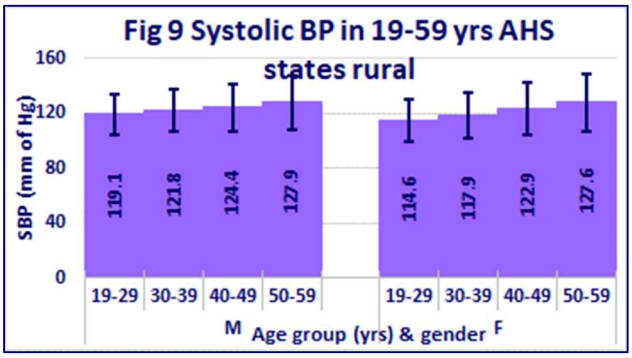


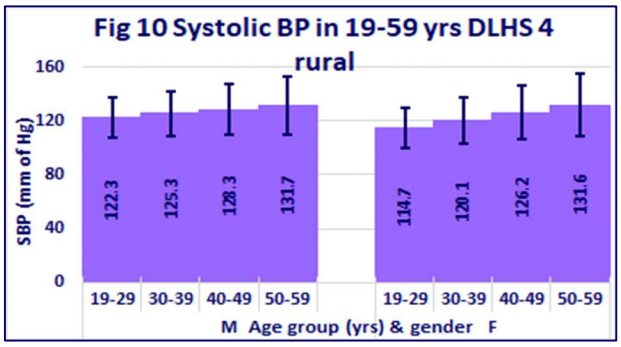
Both in AHS states and DLHS4 states, there was a progressive increase in the mean diastolic blood pressure both in men and women with increasing age beyond 19 years. The increase in the blood pressure in the men and women in the 40 to 59 year age groups was relatively

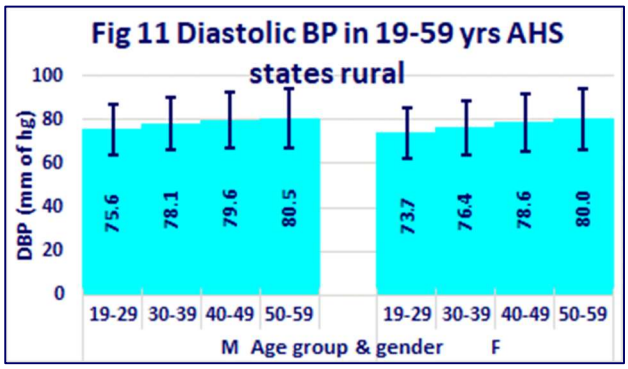
small. This is contrary to the trend in the systolic blood pressure in this age group. There was a small reduction in the mean diastolic pressure in persons beyond 80 years; this might partly be due to a larger number of men and women having been detected and being under treatment. The mean diastolic blood pressure was lower in women as compared to men in the age groups 19-59 years. Among the elderly mean diastolic blood pressure was marginally higher in women as compared to men. A similar trend was seen in the systolic blood pressure also. Both in in men and women the mean diastolic blood pressure across all age groups was higher in the DLHS 4 states as compared to AHS states. (Figs 5 to 8).

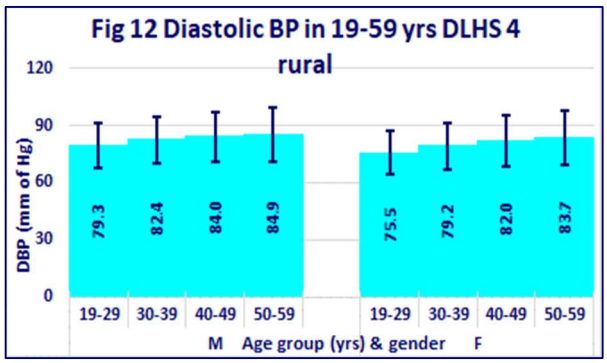
Urban rural differences in blood pressure in 19-59 year age group in AHS and DLHS 4 states

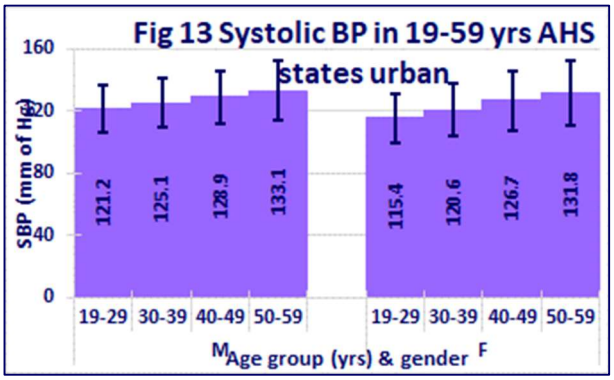
Urban rural differences in mean systolic and diastolic blood pressure in AHS and DLHS4 states in men and women in the 19-59 year age group is shown in Figs 9-16.

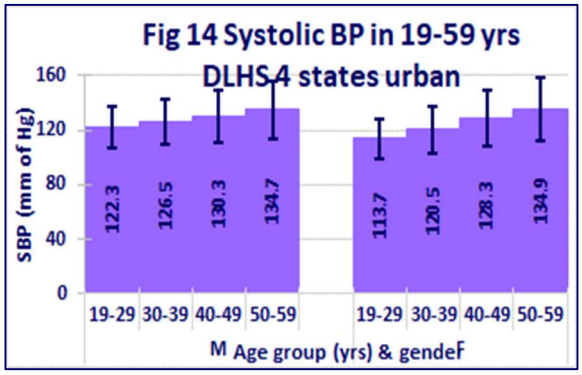




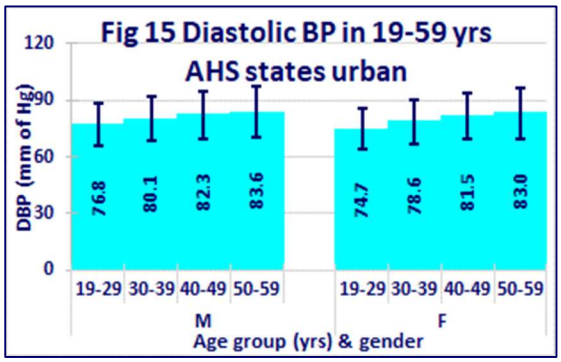


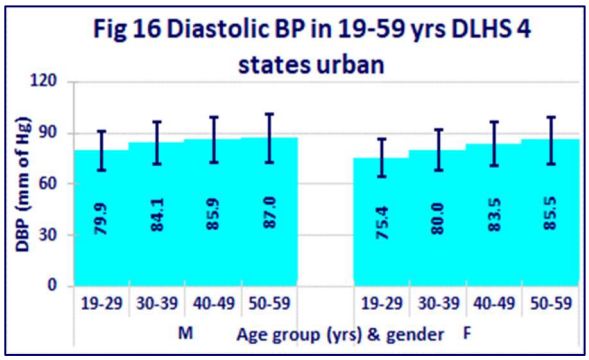






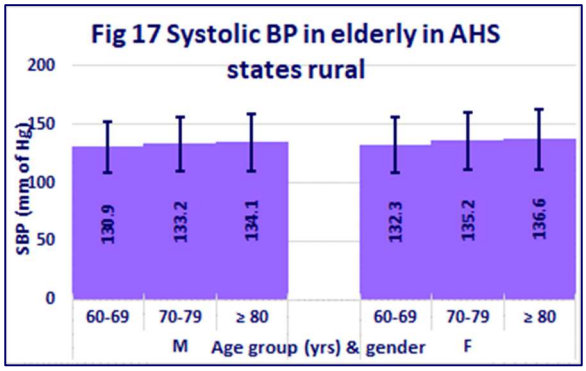
The trend of increase in both systolic and diastolic blood pressure with increasing age between 19 and 59 years in men and women was seen both in urban and rural areas in DLHS 4 and in AHS states. Both mean systolic and diastolic blood pressures were higher in urban as

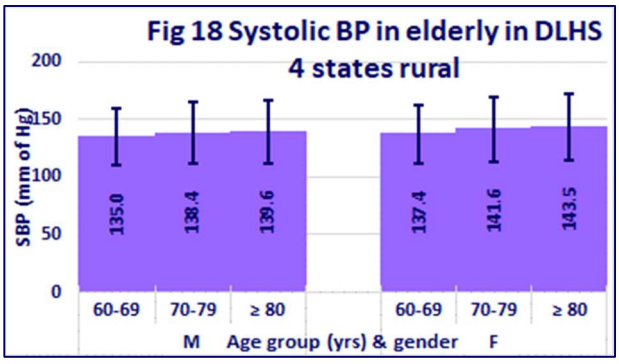




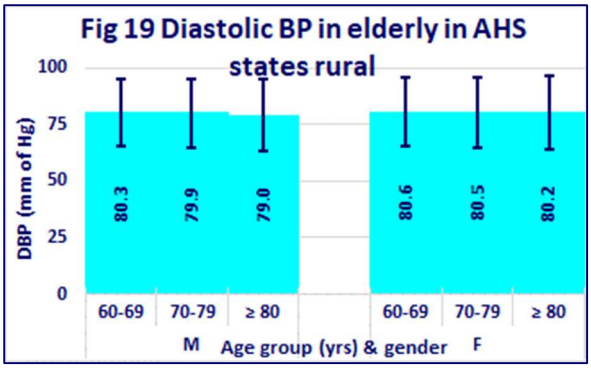
compared to rural areas both in AHS and DLHS states. Both in urban and rural areas the systolic and diastolic BP were higher in men as compared to women. Mean systolic and diastolic BP was higher in DLHS 4 states as compared to AHS states both in urban and rural areas.

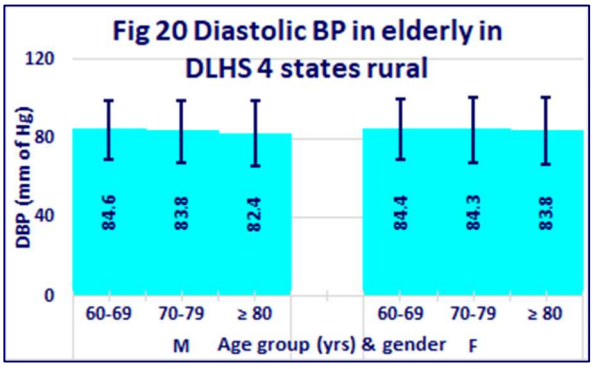
Urban rural differences in blood pressure in the elderly in AHS and DLHS 4 states

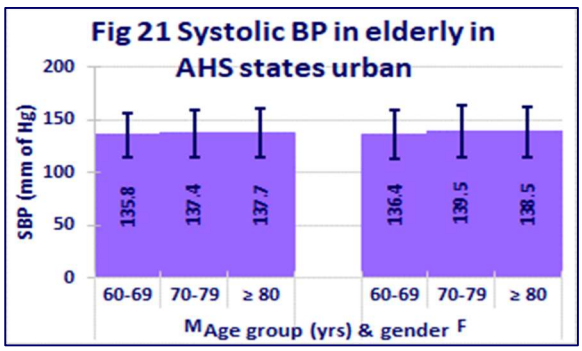


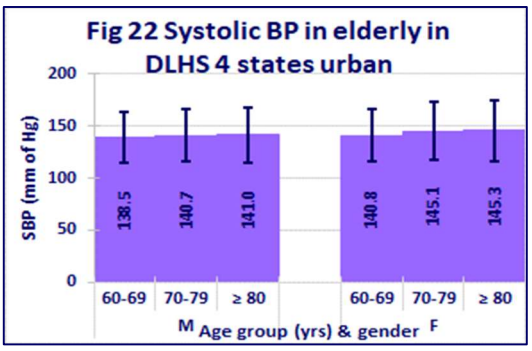


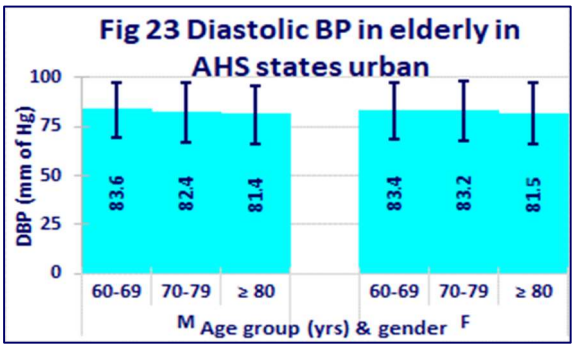
Urban rural differences in mean systolic and diastolic blood pressure in AHS and DLHS4 states in men and women in the elderly age group is shown in Figs 17-24.

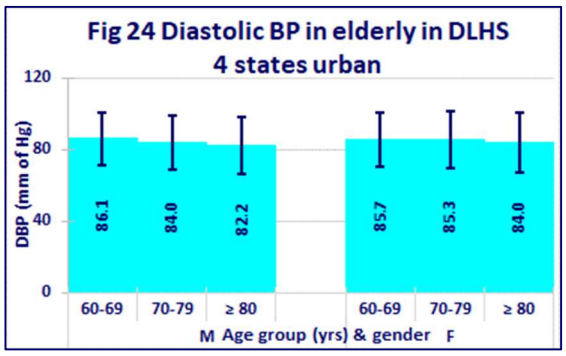












Policy and programme implications of the findings

There was a small rise in both systolic and diastolic blood pressure in the elderly men and women between 60 and 80 years but a small reduction in those beyond 80 years of age was seen both in urban and rural areas in DLHS 4 and in AHS states. Both mean systolic and diastolic blood pressures were higher in urban as compared to rural areas both in AHS and DLHS states. Among elderly both in urban and rural areas the mean systolic and diastolic BP were higher in women as compared to men. Mean systolic and diastolic BP was higher in DLHS 4 states as compared to AHS states both in urban and rural areas and in men and women.

The differences in mean systolic and diastolic BP between AHS and DLHS states, between men and women, between rural and urban areas are small. However, these differences can translate into substantial differences in the prevalence of pre-hypertension as well as grade 1 and 2 of hypertension. Among the elderly the mean systolic and diastolic BP showed only a small rise between 60-69 and 70-79 years; thereafter there was a small fall or plateau. This might be because substantial proportion of the elderly were on antihypertensive drugs. This might also be because those with severe hypertension and CVD might have succumbed earlier and only those who had grade 1 hypertension with no other complications survived beyond 80 years.