

# May Measurement Month 2018: an analysis of blood pressure screening results from Bangladesh

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## KEYWORDS

Bangladesh;  
Blood pressure;  
Screening

Elevated blood pressure (BP) is a growing burden worldwide, leading to over 10 million deaths each year. According to Non-communicable disease (NCD) Risk Factors Survey Bangladesh 2010, one-fifth (21.9%) of adults aged 25 years or more have hypertension. Almost one-third of the adult population did not have their BP measured in their lifetime in Bangladesh. National Heart Foundation of Bangladesh participated in May Measurement Month (MMM) 2018 as a part of a global initiative aimed at raising awareness of high BP and to act as a temporary solution to the lack of screening programmes nationally. An opportunistic cross-sectional survey of volunteers aged  $\geq 18$  years was carried out in May 2018. Blood pressure measurement, the definition of hypertension and statistical analysis followed the MMM protocol. Data were collected from 10 screening sites in 9 districts in Bangladesh. A total of 5208 individuals were screened during MMM18. After multiple imputation, 1750 (33.6%) had hypertension. Among the 1750 participants with hypertension, 1312 (75.0%) were aware of having hypertension. Among those that were not on antihypertensive medication, 15.2% were hypertensive and among those that were on antihypertensive medication 33.6% had uncontrolled hypertension. The present study showed that opportunistic screening can identify significant numbers of people with raised BP. A periodic public health programme at a national level needs to be initiated to increase hypertension detection and control rates and thus for prevention of cardiovascular diseases.

## Introduction

Hypertension is the most common cardiovascular disorder affecting about one-fifth (21.9%) of the adult population of

Bangladesh and it is also the largest contributing risk factors to death and the burden of disease in Bangladesh.<sup>1,2</sup> Measurement of blood pressure (BP) is a cheap, simple, and non-invasive technique to detect hypertension and, if effective therapy is assured, leads to highly cost-effective protection against death and disability.<sup>3</sup> There is no national-level programme for regular screening of

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**Table 1** Crude and age-sex standardized blood pressure measurements using WHO world standard population

	Crude BP	Age and sex standardized BP	Age and sex standardized BP excluding those on treatment	Age and sex standardized BP in those on treatment
N	3856	4785	3757	1028
Systolic BP (mmHg)	124.7	123.0	121.4	129.6
Diastolic BP (mmHg)	76.4	75.7	75.4	77.9

BP, blood pressure.

hypertension in Bangladesh. In 2010, an NCD risk factor survey reported that almost one-third of the adult population (men 44%, women 22.8%, and overall 32.9%) did not have their BP measured in their lifetime in Bangladesh.<sup>4</sup> A recent systematic review also showed that only ~38% of the hypertensive in low- and middle-income countries are aware of it and only 7.7% of hypertensive have their BP under control.<sup>5</sup>

May Measurement Month (MMM), the expansion of World Hypertension Day into a month of standardized global BP measurement and data collection, is a pragmatic and rapid approach to addressing the problem of insufficient awareness of hypertension.<sup>6</sup> The National Heart Foundation of Bangladesh (NHFB) has been leading this global hypertension screening activity in Bangladesh since 2017.<sup>7</sup> The NHFB, in collaboration with several affiliated bodies of NHFB, coordinated the nationwide hypertension screening programme in the month of May 2018.

## Methods

A BP screening survey for the detection of high BP among adults was conducted in 10 screening sites in 9 districts of Bangladesh following the protocol developed by International Society of Hypertension (ISH) for the MMM programme. Investigators from the Hypertension Committee of the NHFB and several affiliated bodies of the NHFB coordinated the screening programme. About 50 volunteers (mostly physicians, nurses, and para-medics trained in BP measurement) were given the task of conducting the screening programme outside hospitals, in outdoor public areas and community settings. Several pharmaceutical companies provided logistic support. Data were collected in a predesigned questionnaire provided by ISH. Volunteer adults (aged  $\geq 18$  years) who had not had their BPs measured for at least a year before the recruitment were the main target population. A questionnaire was administered to collect information about demographic, lifestyle, and environmental factors and each participant had their BP, height, and weight measured and recorded. BPs were measured by digital BP (Omron, model: JPN 1) measuring machines which were supplied by ISH. Incomplete questionnaires were discarded and a total of 5208 data were entered in spreadsheets and sent to the MMM project team for final analysis centrally.

Ideally, three BPs were recorded and crude analyses were done using the mean of the 2nd and 3rd BP readings,

where available. To provide a comparable BP reading for all individuals, multiple imputation was used to estimate the average of the 2nd and 3rd readings where either reading was not documented, using the MMM global data.<sup>8</sup> Mean BPs were standardized for age and sex according to the WHO world age-standard population along with an assumed sex ratio of 1:1. Hypertension was defined as either systolic blood pressure (SBP)  $\geq 140$  mmHg and/or diastolic blood pressure (DBP)  $\geq 90$  mmHg or on anti-hypertensive drug. Detail methods of the programme and analysis have been published earlier.<sup>6</sup>

## Results

A total of 5208 individuals (77.2% men) in 10 sites in 9 districts of Bangladesh participated in the screening programme. Mean [standard deviation (SD)] age of the respondents was 40.7 (13.3) years. Among them 21.7% (1132) were on antihypertensive medication, 16.1% (836) were diabetic, 4.5% (233) had a history of myocardial infarction, and 2.6% (135) had a history of stroke. About 5.4% (63) of female respondents were pregnant. About 22.3% (1160) were smokers, while only 2.8% (146) were alcohol drinkers. The average body mass index was 24.9 (SD 3.7) kg/m<sup>2</sup>.

Mean SBP and DBP were the lowest (SBP 123.9 mmHg and DBP 75.7 mmHg) when Reading 3 was considered compared with the mean of Readings 1 and 2. Mean SBP and DBP of Readings 1 and 2 were 126.3 and 77.2 mmHg, respectively, while the mean of Readings 2 and 3 was 124.6 and 76.4 mmHg, respectively. After imputation, age and sex standardized mean SBP and DBP were 123.0 and 75.7 mmHg, respectively, and after excluding those on treatment, mean SBP and DBP were 121.4 and 75.4 mmHg, respectively (*Table 1*).

After imputation, of the 5208 individuals for whom a mean of the 2nd and 3rd readings were available, 1750 (33.6%) individuals were hypertensive. About 618 (15.2%) of 4076 individuals who were not on antihypertensive treatment were detected as hypertensive and 381 (33.6%) of 1132 individuals who were receiving treatment but identified as having uncontrolled hypertension. This study reported that 64.7% of hypertensive adults were on BP-lowering medication and 66.4% of those on medication had controlled BP. Therefore, overall, among all hypertensive adults, only 42.9% had controlled BP.

## Discussion

The NHFB, in collaboration with several affiliated bodies of NHFB, organized the hypertension screening campaign in Bangladesh following a standardized protocol. In total, 5208 people were screened in this nationwide screening programme. Among them, 33.6% had either untreated or inadequately treated hypertension. However, through this programme 618 adults were detected as newly diagnosed hypertensives and were referred for further assessment. The high estimate of hypertension reported in this study might reflect a biased sample of volunteers and/or might be due to the majority of subjects being recruited from hospital settings. Among the study participants of those not on antihypertensive medication, 15.5% were newly detected as hypertensive and 33.6% of individuals who were receiving treatment had uncontrolled BP. The MMM 2017, country report of Bangladesh showed that 52.2% of individuals who were receiving treatment had uncontrolled BP. In this study, the mean SBP and DBP was higher among those that were on treatment compared to those that were not on treatment, pointing to a larger number of adults with uncontrolled hypertension.

Nationwide hypertension screening programmes like MMM provide the opportunity to identify significant numbers of people with raised BP. A periodic public health programme for hypertension detection at a national level would be very helpful to increase hypertension detection and thus enhance the prevention of cardiovascular diseases.

**Conflict of interest:** none declared.

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