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# May Measurement Month 2019: an analysis of blood pressure screening results from Bangladesh

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## KEYWORDS

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According to the Non-communicable disease Risk Factors Survey of 2018, more than one-fifth (21.0%) of adults aged 25 years or older have hypertension and one-third of the adults did not have their blood pressure (BP) measured in their lifetime in Bangladesh. The National Heart Foundation of Bangladesh participated in May Measurement Month (MMM) 2017 and 2018 as well as this 2019 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 worldwide. This opportunistic screening of voluntary participants aged  $\geq 18$  years was carried out from May to July 2019. Data were collected from 100 screening sites in 16 districts in Bangladesh. BP measurement, the definition of hypertension, and statistical analysis followed the MMM protocol. Data on 24 941 individuals were analysed. Among the participants, 12 658 (50.8%) were female. After multiple imputation, 6990 (28.0%) had hypertension. Among the 6990 participants with hypertension, 5007 (71.6%) were on antihypertensive medication and 5331 (76.3%) were aware of having hypertension. Among 6990 participants with hypertension, 3217 (46.0%) had controlled BP ( $< 140/90$  mmHg) and among the participants with hypertension and on antihypertensive medication, 64.2% had controlled BP. Opportunistic BP screening can identify significant numbers of people with raised BP and thus assist in the prevention of cardiovascular diseases.

## Introduction

Non-communicable diseases (NCDs) are estimated to account for 67% of all deaths and among these, 30% of deaths are caused by cardiovascular diseases in Bangladesh.<sup>1</sup>

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Stroke and ischaemic heart diseases have become the leading causes of death and hypertension is one of the top contributors of DALY in Bangladesh.<sup>2</sup> The recent WHO NCD STEP survey in 2018 reported that 21% of adults aged 25 years or more have hypertension while half of them (51.3%) were unaware of their hypertensive status revealing a large diagnosis gap.<sup>3</sup>

The Government of Bangladesh adopted a multisectoral action plan to control NCD and initiated different programmes in line with the WHO Global Action Plan to achieve a target of a 25% relative reduction of prevalence of raised blood pressure (BP) by 2025 relative to 2010 levels.<sup>4</sup> However, there is a lack of regular community-based screening programmes for the detection of high BP. The National Heart Foundation of Bangladesh (NHFB) has been working for the control and prevention of cardiovascular diseases and co-ordinated the conduct of the two previous May Measurement Month (MMM) events in 2017 and 2018, in collaboration with government and non-government organizations throughout the country, with technical support from the International Society of Hypertension (ISH).<sup>5,6</sup> In 2019, NHFB participated in another round of MMM aimed at raising awareness of high BP and to act as a temporary solution to the lack of regular BP screening programmes in Bangladesh.

## Methods

The MMM 2019 screening programme was co-ordinated by the leadership of the Hypertension Committee of NHFB. Ethical approval for the screening programme (Ref no. NHFH&RI 4-1/14/Ad-/1011 dated 15 May 2019) was obtained from Ethics Review Committee of the National Heart Foundation Hospital & Research Institute, Bangladesh. Screening was conducted by volunteers of NHFB, Affiliated Bodies of NHFB and Department of Non-Communicable Disease of Bangladesh University of Health Sciences in 100 sites of 16 districts of Bangladesh with technical assistance from the International Society of Hypertension (ISH). Several local pharmaceutical companies provided logistic support for setting up sites in the communities. Leaflets and posters with health messages regarding hypertension and its risk factors were distributed in the locality to inform people about screening sites and dates. Adults (aged  $\geq 18$  years) were the main target population.

Screening was conducted according to the MMM protocol.<sup>7,8</sup> Data were collected by 'paper-pencil' method on a predesigned questionnaire designed by ISH. Participation was voluntary and verbal consent was taken from each participant. Information about demographic, lifestyle, and environmental factors was collected and each participant had their height, weight, and BP measured and recorded. BP was measured using a digital machine (Omron, model: JPN 1) largely provided by a donation from OMRON Healthcare to ISH at the time of the MMM 2018 campaign. Data were entered on spreadsheets developed by the MMM project team and were sent to the MMM secretariat for analysis. Data would be made available upon a request to and approval from MMM secretariat.

Hypertension was defined as either a systolic BP  $\geq 140$  mmHg and/or diastolic BP  $\geq 90$  mmHg or on an anti-hypertensive drug therapy. Detailed methods of the programme and analysis have been published earlier.<sup>7,8</sup> Ideally, three BPs were recorded, and crude analyses were done using the mean of the second and third BP readings, where available. To provide a comparable BP reading for all individuals, multiple imputation using chained equations and global data was used to estimate the average of the second and third readings where either reading was not documented.<sup>8</sup> Further analyses make use of the mean of the second and third BP reading for each participant, as the most conservative estimate.

## Results

A total of 24 941 participants (50.8% women) had at least one BP measured and were included in the analysis. The mean age and body mass index of participants were 40.4 years and 23.1 kg/m<sup>2</sup>, respectively. About 43% (10 881) of participants did not measure their BP within the last 12 months and 85.6% of participants did not participate in either of the previous two MMM events. Among the participants, about 30.1% were smokers, 10.1% had self-reported diabetes, and 3.5% and 3.7% were on aspirin and statin, respectively.

Of the 24 941 participants with at least one BP reading, 6104 (24.5%) had all 3 BP readings recorded. Analysis of only those with all three readings showed that BP fell, on average, by 1.7/1.3 mmHg, from a mean of 120.2/76.6 mmHg for the first reading to a mean of 118.5/75.3 mmHg for the third reading, whereas the corresponding proportion with hypertension fell from 32.2% to 31.0%. The mean of the second and third readings identified the lowest proportion of participants with hypertension (30.6%), compared with any single or combination of measures.

After multiple imputation, 6990 participants (28.0%) had hypertension. Among the 6990 participants with hypertension, 5007 (71.6%) were on antihypertensive medication and 5331 (76.3%) were aware of having hypertension. Among 6990 participants with hypertension, 3217 participants (46.0%) had controlled BP ( $<140/90$  mmHg) and among the participants with hypertension and on antihypertensive medication, 64.2% had controlled BP (Table 1).

## Discussion

NHFB in collaboration with several other organizations have screened almost 25 000 adults during the MMM 2019 campaign. The proportion of hypertensives among the participants was 28% which is higher than the reported national prevalence of 21%. The difference may well reflect to the sampling in MMM of voluntary participants mainly from clinic settings. The relatively higher proportion of awareness about hypertensive status (76.3%) also might be due to fact that people with disease voluntarily took part in the programme, which is common in screening programmes. Despite the high awareness, only 46% of all hypertensives amongst the screenees had their BP

**Table 1** Total participants and proportions with hypertension, awareness, on medication, and with controlled BP

| Total participants | Number (%) with hypertension | Number (%) of hypertensives aware | Number (%) of hypertensives on medication | Number (%) of those on medication with controlled BP | Number (%) of all hypertensives with controlled BP |
|--------------------|------------------------------|-----------------------------------|---|--|--|
| 24 941             | 6990 (28.0%)                 | 5331 (76.3%)                      | 5007 (71.6%)                              | 3217 (64.2%)   | 3217 (46.0%)                                       |

controlled, indicating that a treatment gap needs to be addressed in this population.

So far, NHFB has taken part in three MMM campaigns since 2017. In MMM17, a total of 11 418 individuals was screened, of which 47.3% had hypertension and among individuals receiving anti-hypertensive medication, 52.2% had uncontrolled BP.<sup>5</sup> In MMM18, a total of 5208 individuals were screened, 33.6% had hypertension and among those who were on antihypertensive medication 33.6% had uncontrolled hypertension.<sup>6</sup> Differences in the proportions with hypertension and control rates in 2017 and 2018 may reflect that in MMM17 a large number of the participants were screened in community settings, whilst in MMM18 most of the participants were screened from hospital outdoor set-ups. Awareness of hypertension status among the hypertensive patients were very similar in all three MMM campaigns. MMM19 is the largest BP screening campaign undertaken in Bangladesh. It has sensitized the policy-makers and programme managers of Non-Communicable Disease Control Program of the Directorate General of Health Services who initiated a day-long national screening programme on World Hypertension Day (17 May) at the community clinic level in Bangladesh in 2019. Despite relatively high awareness of hypertensive status among hypertensive among participants, more than 10 000 patients had the opportunity for measurement of their BP in the last 12 months through this campaign. Therefore, nationwide hypertension screening programmes like MMM provide the opportunity to identify significant numbers of people with raised BP as well as provide valuable information regarding a treatment gap.

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