

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

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Hypertension remains the dominant cardiovascular risk factor worldwide. May Measurement Month (MMM) is an annual global programme of the International Society of Hypertension aimed at screening for undetected hypertension in the general population. We report the outcome of MMM 2018 in Nigeria. An opportunistic screening of adults aged at least 18 years was conducted in the six geopolitical zones of Nigeria in the month of May, 2018. Screening for hypertension was done by trained volunteers with the use of validated digital and mercury sphygmomanometers following the MMM protocol. Hypertension was defined as blood pressure (BP) $\geq 140/90$ mmHg or the use of BP-lowering medication. There were 6398 participants (53.0% female) with a mean (SD) age of 41.7 (15.0) years. Hypertension was present in 36.4% of the participants with 51.1% of the hypertensives aware of their status, 41.8% on medication, of whom 43.1% were controlled. Overall, only 18.0% of all hypertensive participants had their BP under control. The proportion with hypertension is high, and awareness, treatment, and control rates are low. Concerted efforts are needed to improve awareness and treatment of hypertension in Nigeria in order to reduce the high rate of complications associated with uncontrolled BP.

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Table 1 Key proportions for participants with hypertension

Total participant	Number with hypertension	Proportion of all participants with hypertension (%)	Proportion of hypertensives aware (%)	Proportion of hypertensives on medication (%)	Proportion of those on medication with controlled BP (%)	Proportion of all hypertensives controlled (%)
6398	2328	36.4	51.1	41.8	43.1	18.0

Introduction

Hypertension is highly prevalent in Nigeria, the most populous black nation in the world with an estimated prevalence of 28.9%.¹ This prevalence is higher among men compared with women (29.5% vs. 25.0%) and among urban compared with rural dwellers (30.6% vs. 26.4%).¹ It remains the leading risk factor for stroke,² heart failure, and chronic kidney disease in the country. The most devastating complication of hypertension is stroke, which affects younger age group in Sub-Saharan Africa (SSA).² In the Stroke Investigative Research and Educational Network (SIREN), the incidence of cases <50 years of age at the time of diagnosis is 24.3%.³

May Measurement Month (MMM) is an initiative of the International Society of Hypertension (ISH) endorsed by the World Hypertension League (WHL), entailing a global cross-sectional blood pressure (BP) survey of volunteer adults (aged ≥ 18 years) who ideally have not had their BP measured for at least a year before recruitment. Nigeria's participation in MMM has provided an avenue for an annual opportunistic population-wide screening which could have been more capital intensive without the support received from the organizers and the supporting partners. In MMM 2017, 36.2% of the 19 904 participants were diagnosed with hypertension using the cut-off values of ≥ 140 mmHg systolic and/or ≥ 90 mmHg diastolic or self-reported on treatment for hypertension.⁴ In addition, about three out of every five participants on treatment did not have their BP under control. We hereby report the outcome of MMM18 in Nigeria.

Methods

The 2018 edition of MMM built on the gains recorded in 2017. As with the 2017 screening, the six geo-political zones of the country were represented and we broadened participation by having those states that were not included in the 2017 edition. Thus, there was at least one screening centre in each of the 36 states and the Federal Capital Territory, Abuja. Central co-ordination was provided by the office of the Secretary-General of Nigerian Hypertension Society (NHS). Data collection was done by trained volunteers who were mainly doctors, nurses, pharmacists, physiotherapists, and medical students. The study received funding from the ISH and the NHS.

Throughout the month of May, participants were recruited from public places, including some from general

outpatient departments of hospitals. Recruitments took place after public awareness campaigns in markets, places of worship, and on local radio and television stations in some states by members of the NHS. In addition to the Omron[®] digital sphygmomanometers donated by OMRON Healthcare and supplied by ISH, volunteers' digital and mercury sphygmomanometers were used in measuring the BP in the sitting position following the MMM standard protocol. Readings were taken three times and the mean of readings 2 and 3 was used in the analysis. In addition, weight (kg) and height (cm) were measured in standardized fashion using appropriate instruments. As in the MMM17 global paper, hypertension was defined as systolic BP (SBP) ≥ 140 mmHg or diastolic BP (DBP) ≥ 90 mmHg or being on treatment for hypertension.⁵ Collected data were entered directly into the MMM App or a Microsoft Excel spreadsheet in occasional instances where it was impossible to use the App due to logistic challenges like lack of or poor internet access. This population-wide screening was approved by the country's National Health Research Ethical Committee (NHREC). Data were analysed centrally by MMM project team and multiple imputation performed to impute the mean of readings 2 and 3 where this was missing.⁵

Results

There were 6398 participants (99.5% Black, 53.0% female) with a mean (SD) age of 41.7 (15.0) years and 69.5% of whom were below the age of 50. Only 3.8% participated in MMM2017, 15.2% were on an antihypertensive agent, whereas 25.0% had never had their BP checked before (Supplementary material online, Table S1). Table 1 shows that 2328 (36.4%) of the 6398 of participants had hypertension with 51.1% of these being aware of their hypertensive status, 41.8% were on BP-lowering medication and 43.1% of those on treatment were controlled. Only 18.0% of all hypertensive participants had their BP under control. When individuals receiving treatment were excluded, there was a direct association between advancing age and BP in both sexes, with peak BP readings in those who were between 60 and 65 years of age (Supplementary material online, Figure S1). As shown in Figure 1, after controlling for age, sex, and antihypertensive medication, SBP and DBP readings were significantly higher in those previously diagnosed with hypertension, diabetes mellitus, and stroke, compared with those who did not have a previous diagnosis of hypertension, diabetes, and stroke, respectively.

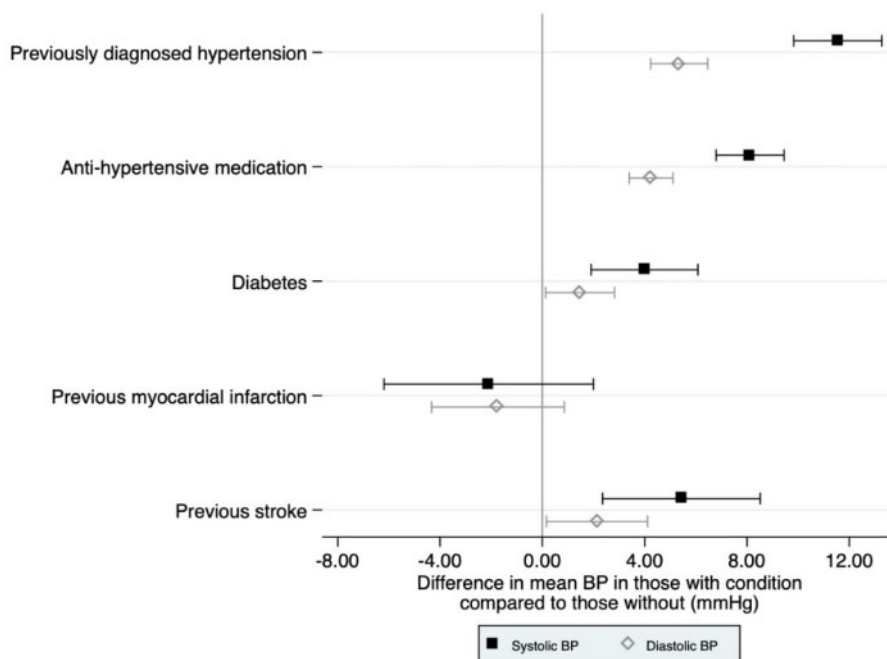


Figure 1 Difference in mean blood pressure according to participant co-morbidities and hypertension management compared with those without from linear regression models adjusted for age, sex, and antihypertensive medication.

Discussion

MMM remains the largest population-wide BP screening in Nigeria. MMM18 showed that 36.4% of the participants had BP $\geq 140/90$ mmHg. About half of these were aware of their elevated BP while only 18.0% had their BP under control ($<140/90$ mmHg). About 70% of the participants in this year's campaign were below the age of 50 years and a direct association between advancing age and BP has been shown.

The 36.4% rate of hypertension in this campaign is similar to the 36.2% reported in 2017.⁴ This shows that concerted efforts are still needed to reduce the prevalence of hypertension in Nigeria so as to prevent avoidable complications like stroke, chronic kidney disease, heart failure, and ischaemic heart disease. That stroke and diabetes mellitus were associated with significantly higher BP readings is not surprising since clustering of cardiovascular risk factors is common, increasing chances of adverse cardiovascular outcomes like stroke, chronic kidney disease, and myocardial infarction. These findings highlight the need for more assertive management in these high-risk patients. Only 39.8% of hypertensive stroke survivors had their BP controlled in an earlier cross-sectional study in the country.⁶ The poor BP control noted in this screening highlights the need for continuous counselling of patients with hypertension to improve medication adherence which has been shown to be poor.^{7,8} Similarly, counselling on avoiding other barriers to good BP control including smoking, alcohol consumption, and sedentary lifestyle need to be encouraged. In addition, the government needs to improve access to BP-lowering medications through adequate health insurance.

Although we made all attempts to include all states in the federation in this year's screening, it is likely that the

sample is not completely representative due to the opportunistic non-randomized method of including screenees and the inability of some screening centres to upload their data or submit on Microsoft Excel spreadsheet. Efforts will be made in subsequent years to get all parts of the country actively involved through early planning, including seeking for sponsorship.

Supplementary material

[Supplementary material](#) is available at *European Heart Journal Supplements* online.

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Conflict of interest: none declared.

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