

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

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### KEYWORDS

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Elevated blood pressure (BP) is one of the leading risk factors for death and disability globally. It is also an important global health challenge because of its high prevalence and resulting morbidities. Albeit, a substantial number of people who have hypertension are either oblivious of it, not treated, or being managed but remain uncontrolled. May Measurement Month (MMM) is a global initiative led by the International Society of Hypertension (ISH) with the goal of increasing awareness of high BP and serving as a spur to establish screening programmes worldwide. An opportunistic cross-sectional survey of volunteers aged  $\geq 18$  years was carried out in May 2018. Measurement of BP and collection of relevant health information were performed according to a standardized protocol for MMM. Screening sites were set up in churches, mosques, health facilities, pharmacies, recreational parks, sports facilities, shopping centres, marketplaces, universities, workplaces, and community centres across four regions of Ghana. A total of 6907 participants were screened during MMM 2018. After multiple imputation, 2354 (34.1%) had hypertension. Of individuals not taking antihypertensive medications 1526 (25.1%) were hypertensive of whom 48.4% were aware of having it. Also, of individuals taking antihypertensive medications 432 (52.2%) had uncontrolled BP. Data obtained from this project demonstrates that a significant number of people with hypertension are unaware of having it, are untreated, or are on treatment but remain uncontrolled. It also highlights the effectiveness of BP screening campaigns as a tool to identify persons with elevated BP.

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## Introduction

Hypertension is a leading global health risk and important global health challenge due to its high prevalence and resulting morbidities.<sup>1,2</sup> It is estimated to result in about 11 million deaths globally. It also accounts for 57 million disability-adjusted life years annually and a major risk factor for coronary heart disease and ischaemic as well as haemorrhagic stroke.<sup>3</sup>

In Ghana, hypertension has been a major cause of cardiovascular disease morbidity and mortality over the last four decades.<sup>4</sup> Nevertheless, its awareness, treatment, and control are poor.<sup>5,6</sup> Researchers have observed that obesity, use of alcohol, physical inactivity, poor diets among other risk factors were associated with the increasing prevalence of hypertension.<sup>7</sup> The increase in these risk factors across several African countries have contributed to the high burden of the condition.<sup>8</sup>

It has also been observed that just about half of the population with hypertension are aware of having it.<sup>9</sup> Therefore, identifying persons with high blood pressure (BP) through screening campaigns, making them aware of their condition and starting them on treatment is of critical importance for promotion of population health and reduction of disease burden. Ghana joined the worldwide hypertension awareness campaign, May Measurement Month 2018 (MMM18), in an effort to increase national awareness about hypertension.<sup>10</sup>

## Methods

A convenience sampling technique which was volunteer-based was employed for the MMM BP screening study. The study was coordinated by a team of health professionals. Ethics approval was obtained from the ethics review committee of the Ghana Health Service. About 70 sites were set up in churches, mosque, health facilities, pharmacies, recreational parks, sports facilities, shopping centres, marketplaces, universities, workplaces, and community centres across four regions of the country. Representatives from the participating regions who were trained health professionals organized training sessions on how to measure BP via video demonstrations for all the screening volunteers. Media publicity in a number of radio stations as well as TV stations was organized. Large banners were also displayed in public places to help with publicity. OMRON BP monitors donated by OMRON Healthcare were used for the screening campaign. Limited financial support also came from individual donors. Target participants were volunteer adults ( $\geq 18$  years) who ideally had not had their BP measured in the previous year. Hypertension was defined as a systolic BP  $\geq 140$  mmHg or diastolic BP  $\geq 90$  mmHg (based on the mean of the 2nd and 3rd BP readings) or on treatment for hypertension.

Data obtained were initially collated by country leads, cleaned by the MMM project team, and analysed centrally by MMM project team statisticians. Details of data collection and analysis can be referred to from the Methods section of the MMM global paper.<sup>10</sup>

## Results

A total of 6907 participants were screened during the study, comprising 3692 (53.5%) females and 3198 (46.3%) males with the sex of 0.2% being unknown. The mean age of participants was 40.9 years (SD 15.8 years) with ethnicity of a greater proportion (99.0%) being black. Again, of the total number of persons screened, 828 (12%) were on antihypertensive medications, 177 (2.6%) had diabetes, and the mean body mass index (BMI) was  $25.3 \pm 5.0$  kg/m<sup>2</sup>.

After multiple imputation, 2354 out of 6907 (34.1%) participants had hypertension. The number of participants with hypertension of those not receiving antihypertensive treatment was 1526 (25.1%). Of all hypertensive participants, 48.4% were aware of their status and 35.2% were on antihypertensive medication. Of all participants on antihypertensive medications, 47.8% had their BP controlled. After imputation, the age- and sex-standardized mean BP in the participants was 127.8/79.9 mmHg. The mean BP after excluding those on treatment was 127.3/79.6 mmHg, and for those on treatment was 132.3/81.9 mmHg.

Blood pressure significantly increased with increasing BMI (Supplementary material online, Figure S1). Lowest systolic BP was observed on Monday and the highest on Saturday and Sunday (weekends) (Supplementary material online, Figure S2). Systolic BP was also elevated in previously diagnosed hypertensives and in those on antihypertensive medication, but no difference was found in those with a previous history of diabetes, myocardial infarction, or stroke (Supplementary material online, Figure S3).

## Discussion

May Measurement Month (MMM), as a global initiative of the International Society of Hypertension (ISH), provides an opportunity and a big platform to employ a relatively inexpensive, volunteer-based, convenience sampling method to screening BP in an effort to increase national awareness on hypertension.

This MMM study in Ghana aimed at identifying persons with hypertension in the community and also highlighted the need to control the BPs of all who require intervention according to established guidelines.

The study identified 34.1% of total participants having hypertension. Of all hypertensive participants, 48.4% were aware of their status, 35.2% were on antihypertensive medication, and 16.8% of those on antihypertensive medications had BP controlled.

The results presented here are based on an opportunistic screening campaign, and recruitment was not randomized and is therefore not nationally representative. By design, as a cross-sectional survey, true prevalence of hypertension cannot be inferred here and data on individual outcomes is unavailable. In addition, recording BP at one instance (though repeated three times) is obviously likely to involve capture of false positives who would have been provided with lifestyle advice and encouraged to see their General Practitioner (GP) for official testing. Moreover, the proportion of persons with hypertension volunteering to participate may have introduced a selection bias leading to

overestimation of the true proportion of hypertensive persons.

However, despite these limitations, this study sought to primarily raise awareness. Persons found to have untreated hypertension, or uncontrolled BP on treatment, were advised and referred to health facilities for further treatment.

## Supplementary material

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

**Conflict of interest:** none declared.

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