

# May Measurement Month 2017-19: an analysis of blood pressure screening results from Niger

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## KEYWORDS

Hypertension;  
Blood Pressure;  
Screening;  
Treatment;  
Control

The aim of this study was to screen for cardiovascular risk factors with particular focus on high blood pressure (BP) in Niger and thereby to raise awareness among the population of Niger about raised BP and the associated risk to health. The city of Niamey served as our study location during the month of May in 2017, 2018, and 2019. We screened volunteer adults aged  $\geq 18$  years, who completed a pre-established questionnaire and had three sitting BP measurements taken. Hypertension was defined as a systolic BP  $\geq 140$  mmHg or diastolic BP  $\geq 90$  mmHg (based on the mean of the second and third BP readings) or being on antihypertensive medication. We screened 2297 adults of which 42.9% were women and 57.1% men. Of the 2297 screened, 33.2% were found to be hypertensive of whom only 26 (3.4%) were recorded as being on treatment. Approximately 30% of those screened were found to be obese or overweight. High BP is a real public health danger, and this study finds alarming figures that highlight the need for improved policies for screening and management of hypertension. Raising awareness and improving detection of hypertension remain essential to reduce the burden of cardiovascular disease.

## Introduction

In 2007, the prevalence of high blood pressure (BP) was 36% in Niger according to the previous World Health Organization (WHO) STEPS survey.<sup>1</sup> The rates of cardiovascular morbidity and mortality in Niger at that time were reportedly  $\sim 15.5\%$  for strokes and  $0.6\%$  for coronary heart disease.<sup>1</sup>

Niger got involved in the May Measurement Month (MMM) campaign in 2017, 2018, and 2019 to gain an understanding of the prevalence of selected cardiovascular risk factors and high BP, and also as a means of raising awareness about BP among a population that is mostly illiterate. Key findings from previous MMM

publications highlight the low levels of awareness, treatment, and control of raised BP, especially in low- and middle-income countries.<sup>2-4</sup>

## Methods

The MMM data collected in 2017, 2018, and 2019 from Niger are compiled and Professor ALI Ibrahim Touré was the Study coordinator for these surveys in Niger. The study was granted by the NIGER Ethics Committee.

The only study site in Niger was in Niamey the capital and no external sources of funding were received. The promotion of the MMM campaigns included public health messages and endorsements. The screening took place for 1 month in each of the 3 years. Omron BP machines (donated by OMRON healthcare) were used for BP

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**Table 1** Total participants and percentage with hypertension and on medication

| Total participants | Number (%) with hypertension | Number (%) of hypertensives on medication |
|--------------------|------------------------------|---|
| 2297               | 763 (33.2%)                  | 26 (3.4%)                                 |

measurement. Three BP readings were taken and the mean of the second and third readings was used in analysis. Hypertension was defined as systolic BP  $\geq 140$  mmHg or diastolic BP  $\geq 90$  mmHg or on treatment for hypertension. Where one or more BP readings were missing, multiple imputation was used to estimate the missing values, based on global data as described previously.<sup>2,3,4</sup>

There were some differences in variables collected by questionnaire across years. For example, data on awareness and screening site type were collected in 2018 and 2019 only.

## Results

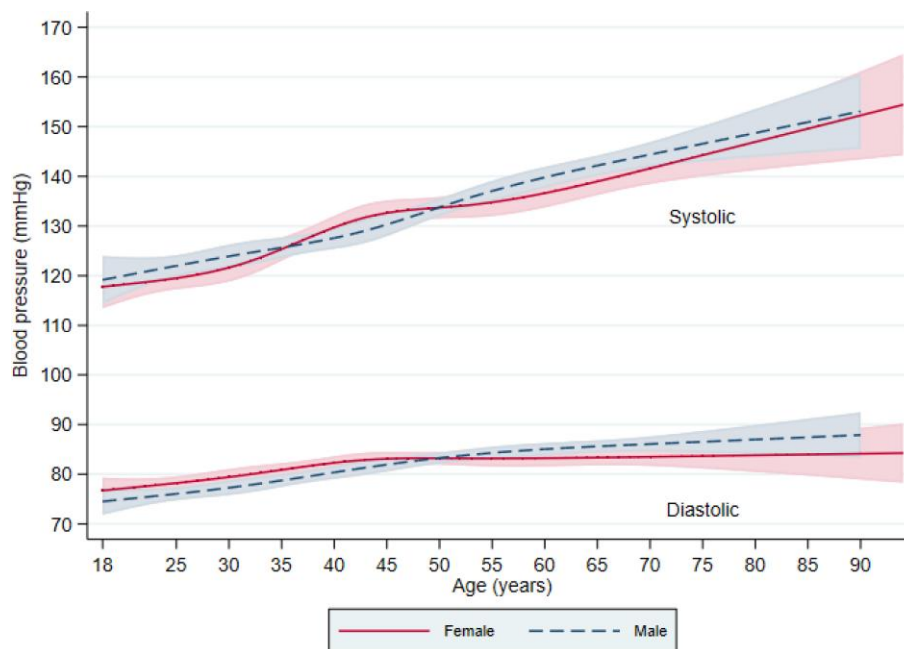
The number of participants in 2017 was 477, in 2018 was 1122, and in 2019 was 698. The mean age was  $43.5 \pm 15.5$  years, 57.0% were men and 42.9% were women. 78.5% of participants were of Black ethnic background. The majority of the screening occurred in hospitals or clinics (47.8%), followed by 32.0% in indoor public areas and 16.8% in outdoor public areas. The mean BP was 132.7/82.9 mmHg among screenees with the second and third BP readings available. After imputation and standardization for age and sex, the mean BP was 129.0/80.7 mmHg. The use of antihypertensive

medication was not recorded in 2017 and was missing for 55.3% of participants in 2018 and 89.3% of participants in 2019. Of the 557 participants across 2018-19 for whom antihypertensive medication use was recorded, only 26 (4.5%) were reported taking antihypertensive medication. Of all 2297 participants, 763 (33.2%) had hypertension after imputation of missing BP readings (*Table 1*), of whom 3.4% were recorded as being on antihypertensive medication. The association between age and sex with systolic BP in people who were not taking antihypertensive medication showed a linear increase. For diastolic BP, a less pronounced relationship was shown. After 50 years of age, the systolic and diastolic BPs were slightly higher in men than in women (*Figure 1*).

## Discussion

The percentage of participants with hypertension in MMM 2017-19 in Niger was 33.2%, and with only 3.4% of hypertensive people recorded as being on treatment. The prevalence of hypertensive patients found in our survey is similar to that found in the 2007 WHO STEPS Survey, which was 36.3%, although STEPS only included adults aged 15-64 years.<sup>1</sup>

Limitations of the study include a large percentage of missing data on antihypertensive medication use, which was not collected in 2017 and unrecorded for most participants in 2018 and 2019 and is likely to lead to an under-reporting of the true prevalence of hypertension, which may explain some of the differences with the STEPS survey. Furthermore, participants were screened opportunistically, and there may be selection bias in the samples, which were not designed to be nationally representative. Despite this, the results show that opportunistic screening can detect large numbers of people with undiagnosed



**Figure 1** Change in blood pressure with age and sex excluding participants on antihypertensive medication.

hypertension. Although outcomes of those screened were not captured, participants with hypertension were directed to local healthcare facilities for further assessment and provided with lifestyle and dietary advice to reduce their BP.

The MMM campaign in Niger highlights a large number of people with hypertension can be screened opportunistically. In the absence of systematic and population-based screening, the MMM campaign should be continued annually in order to raise awareness of raised BP and its complications among the population.

## Funding

None declared.

**Conflict of interest:** None declared.

## Data availability

The data underlying this article will be shared upon reasonable request to the corresponding author.

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