May Measurement Month 2019: an analysis of blood pressure screening results from Cape Verde

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The Cabo Verdean population is aging and, consequently, non-communicable diseases, namely cardiovascular diseases, are increasing, with hypertension being an important risk factor. Following Cabo Verde’s engagement with the May Measurement Month (MMM) campaign, in 2019, it was possible to improve the screening capacity, at the same time that a major social mobilization campaign was carried out to improve the population’s knowledge about raised blood pressure (BP) and its consequences. With activities on nine islands, telemedicine was used to train researchers and volunteers. The MMM app was used to collect participant data. Individuals aged ≥18 years were recruited through opportunistic sampling. Each participant completed a questionnaire on demographic, lifestyle and environmental factors and had three BP measurements and weight and height measurements. Hypertension was defined as a systolic BP ≥140 mmHg and/or diastolic BP ≥90 mmHg (mean of the second and third readings), or when using antihypertensive medication. When respondents did not provide three BP readings, multiple imputation using chained equations was used to calculate the mean of the second and third readings. A total of 17 627 individuals [mean age of 42.7 (SD 16.2); 63.8% women] were screened. After multiple imputation, 5990 (34.0%) had hypertension, of which 68.4% knew the diagnosis previously and 51.3% used antihypertensive drugs. The reported use of antihypertensive medication and a previous diagnosis of hypertension were strong predictors of higher levels of systolic and diastolic BP. Corrective actions were taken with an updated national protocol for hypertension treatment in primary health care. The II Non-Communicable Diseases Survey corroborated MMM national data that we see as an ideal initiative to reach the public, raising awareness about this important cardiovascular risk factor and providing political decision instruments.

Introduction

The Republic of Cabo Verde is an archipelago of 10 main islands, 9 inhabited, located from the coast of Senegal. It is
a small country, with 4033 km², and is home to 544 081 inhabitants. Health indicators are relatively positive in the Republic of Cabo Verde. Life expectancy is 80 years for women and 71.8 years for men, infant mortality rate is 13 deaths per 1000 live births, and maternal mortality rate is 18.8 deaths per 100 000 live births.

Cabo Verde has been facing its demographic and epidemiological transition for more than two decades. Along with the increase in non-communicable diseases, it still maintains the burden of communicable diseases, which, in a small country with scarce human and economic resources, increases the challenges. With the increase in life expectancy, cardiovascular diseases (CVD) have taken on a prominent role in the disease burden. In 2018, data from the Ministry of Health and Social Security indicated CVD as the leading cause of morbidity and mortality, 35% of overall mortality, with cerebrovascular disease being the most frequent cause (35%). Ischaemic heart disease already accounts for 18.3% of CVD mortality. A total of 80% of stroke patients have hypertension, and thus, hypertension constitutes a significant burden on CVD in the country. In 2007, Cabo Verde conducted a survey on non-communicable diseases according to the WHO STEPWISE methodology. Hypertension prevalence was 35%. As of 2017, the country has collaborated with the WHO May Measurement Month (MMM) campaign, envisioning the campaign as a possibility to get to know the country’s situation better. The 2017 and 2018 data showed a hypertension prevalence of 29% and 32%, respectively.

**Methods**

A team coordinated the study, after approval of the MMM protocol by the National Council of Research Ethics. It was carried out throughout the national territory, in health structures, schools, workplaces, markets, and public spaces, where, in addition to measurements, counselling activities were carried out on hypertension and general measures. A large number of volunteers were trained, either in person or by using the National Telemedicine network. Funding was provided by the Ministry of Health and Social Security and the local WHO. The study ran throughout May 2019. The OMRON machines, kindly provided to MMM via OMRON Healthcare, were used. Three measurements were made in all respondents and, preferably, in the sitting position. The definition of hypertension used was the same as in the global study—a systolic blood pressure (BP) ≥140 and/or diastolic BP ≥90 mmHg based on the mean of the second and third BP reading or being treated for hypertension. Data were collected using the MMM app, not requiring local cleaning, and were centrally analysed by the MMM project team. Where a BP reading was unrecorded, multiple imputation was used to estimate the mean of the second and third BP, based on global data.

**Results**

Of a total of 17 627 screenings, with an average age of 42.7 (SD 16.2), more women (63.8%) were screened than men. After multiple imputations, 5990 out of 17 627 were hypertensive, corresponding to 34.0% of respondents. Based on the results of all of the hypertensive patients, 23.8% were controlled (<140/90 mmHg). Of all those with hypertension, 51.3% were on medication and 48.7% were not. Of the medicated, 46.5% were controlled. Reported use of antihypertensive medication and a previous diagnosis of hypertension were the strongest predictors of higher levels of systolic and diastolic BP. The average BMI was 25.4 kg/m² (SD 4.5), 13.3% were obese, and 31.4% overweight, with strong positive associations between BP and increasing BMI strata. On average, 4% reported never having had their BP measured. We found that 66.5% reported that they never or rarely consumed alcohol. However, a small but statistically significant increase in both systolic and diastolic BP was seen in those that drank alcohol compared with non-drinkers. After multiple imputations, 5990 out of 17 627 were hypertensive. Of all those with hypertension, 23.8% were controlled (<140/90 mmHg). Of all those with hypertension, 51.3% were on medication and 48.7% were not. Of the medicated, 46.5% were controlled. Reported use of antihypertensive medication and a previous diagnosis of hypertension were the strongest predictors of higher levels of systolic and diastolic BP. (Table 1, Supplementary material online, Table S1 and Supplementary material online, Figure S1). A total of 536 (3%) and 963 (5.5%) were on therapy with statins and aspirin, respectively. Of those screened, 55.5% were of mixed race and 43.1% were black. Only 4% reported never having had their BP measured. We found that 66.5% reported that they never or rarely consumed alcohol. However, a small but statistically significant increase in both systolic and diastolic BP was seen in those that drank alcohol compared with non-drinkers (Supplementary material online, Table S2 and Supplementary material online, Figure S2). The average BMI was 25.4 kg/m² (SD 4.5). 13.3% were obese, and 31.4% overweight, with strong positive associations between BP and increasing BMI strata (Supplementary material online, Table S3 and Supplementary material online, Figure S3). There were no significant differences in systolic and diastolic BP observed in association with conditions such as diabetes, myocardial infarction, or stroke (Supplementary material online, Table S1 and Supplementary material online, Figure S1).

**Discussion**

In 2019, 17 256 screenings were carried out on the nine inhabited islands. The proportion found to be hypertensive was 34%, similar to 2018 data (33%), but slightly higher.

### Table 1: Total participants and percentage with hypertension, awareness of the disease, using drugs and with controlled blood pressure

| Total participants | Percentage with hypertension | Percentage of hypertensive patients aware | Percentage of hypertensive patients using medication | Percentage of those taking medications with controlled BP | Percentage of all hypertensive patients with controlled BP |
|--------------------|------------------------------|------------------------------------------|---------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------|
| 17,627             | 34.0%                        | 68.4%                                     | 51.3%                                             | 46.5%                                           | 23.8%                                                     |
than 2017 (29%). However, we found that in the II Non-Communicable Disease Survey, carried out in February/March 2020, in a sample representative of the population aged 18–69 years, the prevalence of hypertension was 30.8% (preliminary data). This percentage difference may be related to the age limit of the survey (69 years) and the different sampling methods. It was found in MMM19 that the population aware of their condition was relatively high, 68% (58.7% worldwide). However, of the hypertensive participants who were treated, only 46.5% were controlled (58.7% worldwide). Still, data suggest that participants with conditions such as diabetes, myocardial infarction, or stroke had better controlled BP. The use of a statin (3.0%) and aspirin (5.5%) therapies was far below those reported worldwide (21.6%). Risk factors such as increasing BMI and alcohol intake were of some concern. Globally, MMM19 data provided pertinent and important clarifications, which allowed corrective actions, namely an update on the national protocol for hypertension treatment in primary health care. On the other hand, the Cape Verdean population seems well informed and conscious about the importance of BP measurement, with only 4% of participants reporting never having had their BP taken against 40.5% worldwide. The II Non-Communicable Diseases Survey corroborated MMM national data, which we see as an ideal initiative to reach the public, raising awareness about this important cardiovascular risk factor and providing political decision instruments.

### Supplementary material

[Supplementary material](https://academic.oup.com/eurheartjsupp/article/23/Supplement_B/B37/6279110) is available at *European Heart Journal Supplements* online.

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### Conflict of interest

None declared.

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