

May Measurement Month 2021: an analysis of blood pressure screening results from Georgia

Bezhan Tsinamdzhvishvili^{1,2,3}, Amiran Gamkrelidze ⁴, Dali Trapaidze^{1,3,4*}, Lela Sturua^{1,4,5}, Nino Grdzeldze^{1,4}, Tamar Abesadze^{1,2}, Nana Mebonia^{1,4,6}, Nia Giuashvili^{1,4,7}, Nino Gogilashvili¹, Nino Chikovani^{1,2}, Thomas Beaney^{8,9}, Gaia Kiru⁸, Sima Toopchiani⁸, and Neil R. Poulter⁸

¹Georgian Society of Hypertension, 2, Gudamakari str., Tbilisi 0141, Georgia; ²Tsinamdzhvishvili Cardiology Center, 2, Gudamakari str., Tbilisi 0141, Georgia; ³Internal Diseases Department, Iv.Javakhishvili Tbilisi State University, 2, Chavchavadze Ave., Tbilisi 0128, Georgia; ⁴National Center for Disease Control and Public Health of Georgia, Non-Communicable Diseases Department 99, Kakheti Highway, Tbilisi 0198, Georgia; ⁵Petre Shotadze Tbilisi Medical Academy, Public Health Department, 51/2, KetevanTsamebuli Ave., Tbilisi 0144, Georgia; ⁶Tbilisi State Medical University, Medical Faculty, 33, Vazha-Pshavela Ave., Tbilisi 0177, Georgia; ⁷University of Georgia, School of Health Science, 77 a Kostava str., Tbilisi 0171, Georgia; ⁸Imperial Clinical Trials Unit, Imperial College London, Stadium House, 68 Wood Lane, London W12 7RH, UK; and ⁹Department of Primary Care and Public Health, Imperial College London, St Dunstan's Road, London W6 8RP, UK

KEYWORDS

Hypertension;
Blood pressure;
Screening;
Treatment;
Control

The annual global May Measurement Month screening campaign initiated by the International Society of Hypertension aims to raise awareness of raised blood pressure (BP) and in the absence of systematic screening is a useful surrogate indicating the size of the problem of hypertension in the general population in Georgia. May Measurement Month screening was carried out at 400 sites in Georgia in 2021, and more than 500 volunteers, including physicians (80%) and medical students (20%), carried out the screening. Adults aged ≥ 18 years were recruited opportunistically, and three BP readings were measured, along with a questionnaire collecting information on demographics, lifestyle, and co-morbidities. Hypertension was defined as a systolic BP ≥ 140 mmHg or diastolic BP ≥ 90 mmHg, based on the mean of the second and third readings, or in those on antihypertensive medication. A total of 4935 individuals were screened, with a mean age of 53.6 years (SD 17.1). A total of 2836 (57.5%) were found to have hypertension, of whom 2441 (86.1%) were aware of their condition and 83.5% were on hypertensive medication. Of those on medication, 41.6% had their BP controlled ($<140/90$ mmHg). Of all participants with hypertension, 34.7% were controlled. May Measurement Month data highlight the scale of hypertension in Georgia, with low rates of control in those on medication. Educational interventions among the population and medical personnel to raise awareness of high BP and improve control rates are of high importance, which require strong advocacy among policy makers.

*Corresponding author. Tel: +995 599 41 15 19, Email: dali.trapaidze@gmail.com

Introduction

The annual blood pressure (BP) awareness campaign, May Measurement Month (MMM), was initiated in 2017 by the International Society of Hypertension (ISH) and Georgia where hypertension is a major public health challenge has participated on an annual basis since then,¹⁻³ with the exception of 2020 due to the COVID-19 pandemic. In 2021, data from the Institute for Health Metrics and Evaluation (IHME),⁴ in Georgia in 2021, suggested that mortality from cerebrovascular diseases amounted to 266.3 deaths per 100 000 deaths and ischaemic heart diseases (IHDs) amounted to 154.21/100 000 deaths. The top three causes of death were IHD, stroke, and hypertension. According to the National Center for Disease Control and Public Health, the share of cardiovascular diseases (CVD) mortality in the country in 2021 was 37.0%. In 2021, the share of CVD among all new cases was 9.3%, that of IHDs—10.4%, and of cerebrovascular diseases—3.6%.⁵

The screened population in MMM campaigns has increased between in 2017 and 2019 from 6144 to 13 267.¹⁻³ Despite these positive dynamics in terms of raising awareness of hypertension, the MMM 2017-19 data revealed on-going public health challenges in the treatment of hypertension, mainly in regard to low rates of treatment and control. In 2021, Georgia took part again in the MMM, despite difficulties in mass screening the population due to the COVID-19 pandemic. However, the longer/flexible duration of the campaign gave us the possibility to cover a wide range of regions based on epidemiological considerations and this report presents the results from 2021.

Methods

The Georgian Society of Hypertension (GSH), which is an associated member of the ISH, and National Centre for Disease Control and Public Health (NCDC) co-ordinated the campaign in the country. Ethical approval was obtained in March 2021 (Institutional Review Board of the National Center for Disease Control and Public Health). The screening was carried out at more than 400 sites, on a national scale mostly in clinics, pharmacies, and other places of public gathering. More than 500 volunteer doctors (80%) and medical students (20%) participated in the screening. To familiarize them with the research tools and standard BP measurement method, their training was conducted by GSH and NCDC working groups in Tbilisi and other large cities. Social/mass media representatives, medical societies, and other stakeholders were actively involved in the recruitment process. The MMM21 campaign started on May 17th and lasted for almost six months. Sources of funding included ISH, GSH, NCDC, and pharmaceutical companies such as 'Egis', 'Krka', Berlin-Chemie/MENARINI, and Omron-Georgia Ltd.

Blood pressure measurements in the sitting position were taken three times with 1 min intervals, using Omron BP monitors. Pulse

rates were either measured by the BP device or manually between BP readings. Hypertension was defined as a systolic BP ≥ 140 mmHg and/or diastolic BP ≥ 90 mmHg based on the mean of the second and third BP readings and/or being on antihypertensive treatment. In addition, a questionnaire was administered, collecting information on demographics and medical history including recent COVID-19 vaccination, use of hormone replacement therapy (HRT), and hormonal contraception.

Data were entered on pre-prepared paper forms and later transferred to spreadsheets. Data were analysed centrally by the MMM project team, and multiple imputation was performed using global data⁶ to impute the mean of readings two and three where this was missing (which was the case for only one participant).

Results

In total, 4935 individuals were screened. The mean age of participants was 53.6 years (SD 17.1) of whom 40.3% were men, 59.7% were women, and 99.6% were Caucasian. Only 26 persons (0.2%) reported never having had a BP measurement taken by medical personnel before, 19.0% of the respondents were taking aspirin, and 9.8% were taking statins. After multiple imputation, the number of hypertensive persons was 2836 (57.5%) out of whom 2441 (86.1%) were aware and 83.5% were on medication. Of those on hypertensive medication, 41.6% had their BP controlled. Of all participants with hypertension, 34.7% were controlled ([Table 1](#)).

We found significantly higher systolic and diastolic BPs in participants with a previous stroke, previous MI, and in those with diabetes ([Figure 1](#)). Participants on antihypertensive medication also had significantly higher systolic and diastolic BPs, and those with a previous diagnosis of hypertension had significantly higher systolic, but not diastolic, BPs.

Discussion

Hypertension remains one of the main public health problems in the Georgian population. In MMM 2017, awareness of participants with hypertension was 77.9%, and in 2018 was 82.8%.¹ Awareness in 2021 was marginally higher than in previous campaigns, at 86.1%. This small but positive trend may reflect the impact of MMM and similar campaigns. The strong association between higher BPs among those receiving antihypertensive drugs confirms significant room for improvement in the delivery of drug treatment for hypertension that likely involves the drugs and doses used. The percentage of participants with hypertension detected in MMM21 was 57.5% similar to the average rate previously detected (59.4%). Data from the latest nationwide epidemiological survey STEPS in

Table 1 Total participants and proportions with hypertension, awareness, on medication, and with controlled blood pressure

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
4935	2836 (57.5%)	2441 (86.1%)	2836 (83.5%)	2368 (41.6%)	2836 (34.7%)

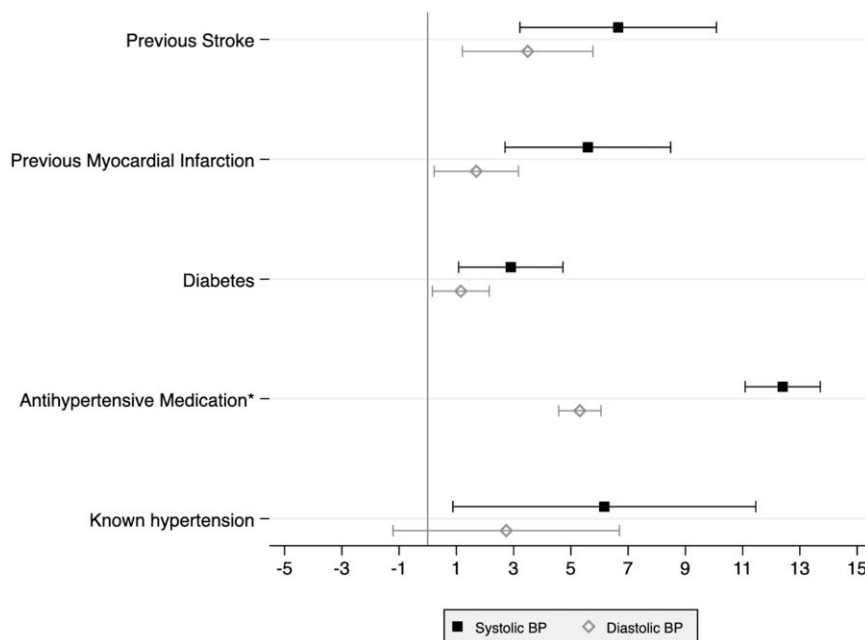


Figure 1 Difference in mean BP in those with condition compared to those without (mmHg).

2016 reported the prevalence of hypertension in the adult population is 37.7%.⁷

According to other recent pilot screening activities (World Heart Day, World Salt Awareness Week, and etc.), the prevalence of hypertension in the population surveyed was up to 50%.⁸

Due to restrictions related to the COVID-19 pandemic, the coverage of the MMM21 campaign was reduced but at the same time the pandemic has positively changed the attitude of some individuals towards their own health. Therefore, the volunteers who attended the screening campaign may have been more motivated to attend and may have been at greater risk of hypertension, leading to the higher rates of hypertension found in our study. The data quality from completed MMM questionnaires has improved importantly since 2017 albeit in-part reflecting *ad hoc* supervision when required. May Measurement Month is currently considered (in the absence of routine systematic and opportunistic screening) to be the best tool to assess hypertension management in the country.

Although campaign years cannot be directly compared, the rate of controlled hypertension within the campaign: 34.8% and 41.6% in 2019 and 2021, suggest that educational interventions such as MMM among the population and medical personnel deserve increasing support among policy makers.

Acknowledgements

The GSH and the NCDC would like to thank all the volunteers and congratulate them for a successful conduction of the campaign. Special thanks to MMM co-ordination group for the support provided.

Funding

None declared.

Conflict of interest: none declared.

Data availability

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

References

1. Tsinamdzgvrishvili B, Gamkrelidze A, Trapaidze D, Sturua L, Grdzeldidze N, Abesadze T *et al.* May Measurement Month 2017: an analysis of blood pressure screening results in Georgia–Europe. *Eur Hear J Suppl* 2019; 21:D53–D55.
2. Tsinamdzgvrishvili B, Gamkrelidze A, Trapaidze D, Sturua L, Grdzeldidze N, Abesadze T *et al.* May Measurement Month 2018: an analysis of blood pressure screening results in Georgia. *Eur Hear J Suppl* 2020;22:H56–H58.
3. Tsinamdzgvrishvili B, Gamkrelidze A, Trapaidze D, Sturua L, Grdzeldidze N, Abesadze T *et al.* May Measurement Month 2019: blood pressure screening results in Georgia, Europe. *Eur Hear J Suppl* 2021;23:B59–B61.
4. Institute for Health Metrics and Evaluation. Global Burden of Disease Compare. Available from: <https://vizhub.healthdata.org/gbd-compare/>.
5. Statistical Yearbook, National Center for Disease Control and Public Health. 2022. 65–67 p. Available from: <https://www.ncdc.ge/#/pages/file/b3956fe5-2a48-4fc1-9a5a-37d13c6d397f>.
6. Beaney T, Wang W, Schlaich MP, Schutte AE, Stergiou GS, Alcocer L *et al.* Global blood pressure screening during the COVID-19 pandemic: results from the May Measurement Month 2021 campaign. *J Hypertension* 2023;41:1446–1455.
7. Non-communicable diseases risk-factor STEPS survey, 2016 [Internet]. Available from: <https://www.ncdc.ge/#/pages/file/207b2c2b-551e-4075-a132-3b8c537c5515>.
8. Qualitative research within the framework of World Salt Week, 2019. [Internet]. Available from: <https://ncdc.ge/api/api/File/GetFile/f72d098e-9699-4b21-8c31-9c014733470d>.