May Measurement Month 2017-2019: an analysis of blood pressure screening results from Lithuania

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In 2017, Lithuania joined the global May Measurement Month (MMM) campaign which aims at raising awareness of raised blood pressure worldwide. Presented here are the data arising from the 2017, 2018, and 2019 campaigns. An opportunistic cross-sectional survey of individuals aged ≥18 years was carried out in Lithuania in 2017, 2018, and 2019. Two thousand nine hundred and nineteen participants were recruited in the MMM campaigns in response to the media engagement and interactions with the study team. The mean age of participants was 46.1 years (SD 16.3) years, 58.9% were females. Blood pressures were measured using electronic devices provided by Omron according to the MMM protocol. Of the 2919 screened participants, 1308 (44.8%) had hypertension. Of all hypertensive participants, the awareness rate, the treatment rate, and the control rates (<140/90 mmHg) were 79.5%, 41.0%, and 14.2%, respectively. Of those on antihypertensive medication, the control rate was 34.8%. The high percentage of participants with hypertension was either untreated (59.0%) or treated but uncontrolled (65.2%) suggests the usefulness of such screening programmes to improve awareness of hypertension control in Lithuania.

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Introduction
Cardiovascular disease (CVD) is the leading cause of death in Lithuania. It accounted for 52.7% of all deaths in 2020 (9.8% more than in 2019).1 Mortality from coronary heart disease is the highest among EU countries (34.9%), exceeding the EU average by four-fold. Mortality from stroke accounts for 13% of all deaths.2 The prevalence of kidney disease reaches up to 7% of the adult population.3 Recent changes in the ESC Guidelines on cardiovascular disease prevention in clinical practice demonstrate the complexity of the situation.4 Lithuania has climbed a step higher in 2021 becoming one of the very high-risk countries for CVD.5

Cardiovascular, cerebrovascular and renal mortality and morbidity is mostly related to clinical risk factors, including high blood pressure (BP), dyslipidaemia, smoking, overweight, or diabetes. According to Lithuanian nationwide data, age-adjusted mean BP in the population increases over time.6 The recent Health Interview Survey 2019 showed that 30% of the population (women, 33%; men, 26%) had arterial hypertension and that the prevalence of arterial hypertension increased by 2% from 2014 to 2019 both in males and females.3 A large-scale middle-aged population primary prevention program

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was used to measure the associations between systolic and diastolic BP with participant risk factors.

Results

In total, 2919 adults were screened in the three years of the MMM campaigns in Lithuania: 2019, 378 and 522 in the MMM 2017, MMM 2018 and MMM 2019, respectively. The mean age of participants was 46.1 years (SD 16.3). In total, 58.9% were woman and 39.2% were men; 30.8% of participants were white, 69.2% were identified as unknown; 5.7% of participants were taking aspirin while 10.7% were taking statins from the 2019 data. Of the combined screeners, following multiple imputation, 1308 (44.8%) individuals had hypertension, and 41.0% of those reported using antihypertensive treatment. Of 536 participants on medication, 34.8% had controlled BP (<140/90 mmHg). Of all those who were hypertensive, 14.2% had controlled BP. Of 372 participants with hypertension in the 2018 and 2019 data, when awareness was collected, 79.5% were aware of their condition (Table 1). Of those screened in 2018 or 2019, 141 (15.7%) had never had their BP measured. Among associations of participant factors with mean BP from linear regression in the 2018 and 2019 data, participants who were fasting during the MMM period showed significantly higher systolic and diastolic BP (3.2 mmHg, \( P < 0.001 \); 2.8 mmHg, \( P < 0.001 \)). Participants who were obese also had significantly higher mean systolic and diastolic BP than those of a healthy weight (6.0 mmHg, \( P < 0.001 \); 3.0 mmHg, \( P < 0.001 \)).

Discussion

The Health Interview Survey 2019 in Lithuania estimated a national prevalence of hypertension of 30%.11 Results from MMM 2017, 2018, and 2019 confirmed a high percentage of hypertension in Lithuania. Almost half (44.8%) of our participants had hypertension. The higher hypertension percentage observed in MMM 2017/2018/2019 can be explained by the older age group of those screened and sampling of MMM, some of which were performed in health care facilities. Interestingly, the majority (79.5%) of hypertensive participants were aware of their hypertension. Two-fifths (41%) of hypertensives were on treatment but only about one-third (34.8%) of those on treatment had controlled BP. In addition, amongst all those with hypertension, less than a fifth (14.2%) had controlled BP. Overall, Lithuanian MMM data show a similar proportion of hypertensives compared with overall European data (44.8% vs. 43.6%) and

| 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 |
|--------------------|-----------------------------|----------------------------------|------------------------------------------|---------------------------------|---------------------------------------------|
| 2919               | 44.8                        | 79.5                             | 41.0                                     | 34.8                            | 14.2                                        |
similar levels of awareness (79.5% vs. 71.5%) However, those who were identified as hypertensive in Lithuania had significantly lower levels of BP control when taking antihypertensive medication(s) (34.8% vs. 47.9%). Lithuanian MMM data are in line with regional MMM reports from Poland and Hungary, where 55.4% and 46.5% of participants were found to have hypertension. However, a larger proportion of treated individuals had uncontrolled hypertension in Lithuania compared with Poland and Hungary. This indicates a low health literacy and ineffective therapy, possibly involving improperly selected regimens and doses or poor medication adherence.

There were some limitations in interpreting the results of the MMM screening campaign because the subjects were selected in a non-random manner and therefore the samples are not representative of the country as a whole. However, the MMM screening campaign shows large proportions of participants with untreated and uncontrolled hypertension. It poses a challenge for Lithuania’s healthcare system. Comprehensive interventions are needed to improve awareness of high BP, the associated risks, and control of hypertension in Lithuania.

In conclusion, MMM results will assist policy makers and other public health stakeholders in designing strategies to identify raised BP and improve BP control rates in Lithuania and could help offset the burden of high BP on the health system.

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Data availability

No new data were generated or analysed in support of this research.

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