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May Measurement Month 2019: an analysis of blood pressure screening results from the United Kingdom and Republic of Ireland

Barry J. McDonnell[1]*, Emma Rees[2], John R. Cockcroft[1], Thomas Beaney[3,4], Bethan Clayton[5], Phuong Le Kieu[5], Adrian J.B. Brady[6], Sandosh Padmanabhan[7], Linsay McCallum[7], Eamon Dolan[8], Eoin O'Brien[9], Maciej Tomaszewski[5], Aletta E. Schutte[10], Neil R. Poulter[4], and Francesco P. Cappuccio[11]; on behalf of the International Society of Hypertension and British and Irish Hypertension Society.

[1]*Cardiff School of Sport and Health Sciences, Cardiff Metropolitan University, Cardiff CF5 2YB, UK;*
[2]*Faculty of Health and Life Science, Swansea University, Singleton Campus, Swansea SA2 8PP, UK;*
[3]*Imperial Clinical Trials Unit, Imperial College London, Stadium House, 68 Wood Lane, London W12 7RH, UK;*
[4]*Department of Primary Care and Public Health, Imperial College London, St Dunstan's Road, London W6 8RP, UK;*
[5]*University of Manchester, Medical School,Manchester, UK;*
[6]*University of Glasgow, Glasgow Royal Infirmary, Glasgow G4 0SF, UK;*
[7]*Institute of Cardiovascular & Medical Sciences, BHF Glasgow Cardiovascular Research Centre, Glasgow G12 8TD, UK;*
[8]*Connolly Hospital Dublin, Dublin, Ireland;*
[9]*The Conway Institute, University College Dublin, Dublin, Ireland;*
[10]*Faculty of Medicine, University of New South Wales, George Institute for Global Health, Sydney, Australia;*
[11]*University of Warwick, Warwick Medical School, and UHCW NHS Trust, Coventry, UK*

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In the UK, heart and circulatory diseases account for 29% of all deaths (14% through coronary heart disease and 8% through stroke). In 2015, the prevalence of hypertension was 20% in the UK and 23% in the Republic of Ireland. In 2019, 14% of people registered with a UK general practice had hypertension and yet it was the attributable risk factor for around half of all deaths from coronary heart disease or stroke. We participated in May Measurement Month 2019 to increase awareness of blood pressure (BP) measurement, and to identify the proportion of undiagnosed hypertension and degree of uncontrolled hypertension in the community. The 2019 campaign set up screening sites within the community at places of worship, supermarkets, GP surgeries, workplaces, charity events, community pharmacies, gyms, and various other public places. We screened 10194 participants (mean age 51 ± 18 years, 60% women) and found that 1013 (9.9%) were on antihypertensive treatment, while 3408 (33.4%) had hypertension. Of the 3408 participants with hypertension, only 33.5% were aware of their condition despite 98.8% having previous BP measurements. In those on antihypertensive medication, only 38.2% had controlled BP (<140 and <90 mmHg). Our UK and Republic of Ireland data demonstrate concerning levels of undiagnosed hypertension and sub-optimal BP control in many individuals with a

* Corresponding author. Tel: +44 02920 416827, Email: bmcdonnell@cardiffmet.ac.uk

diagnosis. This evidence supports a critical need for better systematic community and primary care screening initiatives.

Introduction

Raised blood pressure (BP) is the biggest single risk factor contributing to the global burden of disease.[1] In the UK, heart and circulatory diseases account for 29% of all deaths (14% through coronary heart disease and 8% through stroke). These figures have not improved significantly since 2011 despite national strategies targeted at improved diagnosis and treatment. Furthermore, data from 2015 highlighted that prevalence of raised BP ($\geq$140 and/or $\geq$90 mmHg) was 20% in the UK and 23% in the Republic of Ireland.[2] In 2019, 14% of people registered with a UK general practice had hypertension and yet it was the attributable risk factor for around half of all deaths from coronary heart disease or stroke.[3] These data suggest that the true prevalence of hypertension is higher than is suggested by primary care registries and that sub-optimal management of this risk factor is limiting our ability to positively improve outcomes.

Our goal in participating in the May Measurement Month (MMM) campaign was to assess the extent of undiagnosed high BP in community settings and to raise public awareness of the importance of BP screening. The 2017 UK and Republic of Ireland campaign screened 7695 participants. Of these, 40.3% had hypertension and 21.9% reported taking antihypertensive medications. Of those with known hypertension, only 59.5% had BP within treatment targets ($<$140/$<$90 mmHg).[4] The 2018 campaign screened 5000 participants and found 34.3% to have high BP, of whom 42.8% reported taking antihypertensive treatment and only 51.5% of those on medication had BP within treatment targets.[5]

Our aim for the 2019 campaign was to ascertain whether these annual figures were stable estimates of undiagnosed hypertension in the community and indicators of sub-optimal BP control in those with hypertension.

Methods

In May 2019, community-based opportunistic screening sites were set-up and directed by MMM country leads in England, Scotland, Wales, and the Republic of Ireland. Ethical approval was granted and covered all UK based BP screening events. Over 200 sites were set up and performed BP screening on individuals aged 18 years and older, as part of the campaign. Community screening sites included places of worship, supermarkets, GP surgeries, charity events, workplaces, community pharmacies, gyms, and various other public places. Investigator-lead training days for partners and those taking part in BP screening were conducted prior to screening events. Similar to previous years, Omron provided BP devices to national partners that did not have access to validated systems. In Wales, Cardiff Metropolitan University provided funding for marketing material and promotional purposes. Similar to previous years, the Academy of Medical sciences INSPIRE provided funding for similar promotional and marketing purposes in England. Governmental, celebrity, public health, and British Heart Foundation endorsements via social media, national webpages, and newspaper articles were used to promote the campaign locally and nationally. Screenings events were undertaken each day of May across the UK and Republic of Ireland. Only validated BP monitors agreed by International Society of Hypertension were used and three measurements conducted after 5 min of rest in the seated position, with the average of the second and third measurements used for analysis. For the purposes of this paper, the term 'hypertension' was used when measurements at the event included a systolic BP $\geq$140 mmHg and or diastolic BP $\geq$90 mmHg or on antihypertensive medication(s). In addition to data collected during the 2017 and 2018 campaign, new variables detailing the type of screening event and whether the participant was aware if they had high BP, were recorded. Similar to previous years, data were collected using the MMM App/excel file or hard copy. All data were processed locally by the British and Irish Hypertension Society or MMM lead in Wales. Data were analysed centrally by the MMM project team and multiple imputation performed to impute the mean of readings 2 and 3, where this was missing.[6] The data underlying this article will be shared on reasonable request to the corresponding author.

Results

Data on 10 194 participants were submitted as part of MMM 2019 for the UK and Republic of Ireland. The mean age of participants was 51 $\pm$ 18 years, with a gender ratio of approximately 60% female and 40% male. Of the 10 194 participants screened, 1013 (9.9%) were on antihypertensive treatment. Data were collected across a range of ethnic groups [South Asian: 206 (2%), East Asian: 46 (0.5%), Black: 154 (1.5%), South East Asian: 58 (0.6%), White: 3132 (30.7%), Arabic: 55 (0.5%), Mixed: 67 (0.7%), Other: 89 (0.9%) and uncategorized or Unknown: 6387 (62.7%)]. Only 127 (1.2%) of participants had never had BP measured before the screening event. Of those screened, 237 (2.3%) were currently taking statins, 75 (0.7%) were taking Aspirin, 2.9% reported as having diabetes, 0.6% as having a previous myocardial infarction, and 0.7% a previous stroke. Of the 10 194 participants measured, 3408 (33.4%) were identified as having hypertension. Of all 3408 participants with hypertension, 33.5% were aware of their condition and 29.7% were on antihypertensive medication. Of the 1013 participants on antihypertensive medication, 38.2% had controlled BP ($<$140 and $<$90 mmHg). See *Table 1* for more details.

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

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
10 194	3408 (33.4%)	1104 (33.5%)	1013 (29.7%)	387 (38.2%)	387 (11.4%)

Importantly, of the 9181 participants not on antihypertension medication, 2395 (26.1%) were defined as hypertensive.

Discussion

Our 2019 MMM data show a lower proportion of hypertensives in the UK and Republic of Ireland compared with Europe (33.4% vs. 43.6%).[6] However, those who were identified as hypertensive in the UK and Republic of Ireland had significantly lower levels of awareness (33.5% vs. 71.5%) and lower levels of BP control (to $<$140/$<$90 mmHg) when taking antihypertensive medication(s) (38.2% vs. 47.9%).[6] These important findings further emphasize the need for a more focused primary care and community-based BP awareness campaigns to address these significant inequalities of risk.

The proportion of people identified as hypertensive (33.4%) in this current 2019 dataset was similar to data from 2018 but not 2017, which reported levels as high as ~40%. Importantly, these current data identify 33.4% of those screened as having hypertension ($\geq$140/$\geq$90 mmHg or being on antihypertensive medication), which is higher than the reported prevalence from GP registries and the Public Health England (PHE) estimates of 26.2% published in 2016.[7] The differences observed may reflect the PHE data as 'estimates', which have been based upon data gathered from GP practices and public health data in England only. These differences may in part reflect that the MMM data are based on opportunistic convenience sampling and may not be nationally representative. Furthermore, being based on only one set of readings they may be spuriously high. However, these differences might also highlight the potential for 'estimates' to underrepresent the prevalence of hypertension and extent of the problem in the wider community.

The NHS England Long Term Plan identifies cardiovascular disease as a clinical priority and sets a target of preventing 150 000 heart attacks, strokes, and dementia cases over a 10-year period though national prevention programmes such as 'know your ABCs' (which includes BP) and NHS health checks for those aged 40–75 years.[8] In fact, the British Heart Foundation Cymru launched their political manifesto to Wales Government in November 2020. This manifesto paper described the critical need for early detection of raised BP and appropriate BP control as one of three key cardiovascular health measures to address for Wales Government. Our data highlight that only 1.2% of people screened had never had their BP measured before the event, which suggests that accessibility to measuring BP is not a public health issue in the UK and Republic of Ireland. However, what is of major concern is the population's lack of awareness of their raised BP and the lack of adequate BP control in those with diagnosed hypertension. This evidence supports a critical need for better community and primary care initiatives which highlight the need to identify and act on raised BP, implementing more effective strategies to improve BP control. Only then will we minimize population cardiovascular risk and national economic burden of disease associated with hypertension.

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