May Measurement Month 2017: an analysis of blood pressure screening in the Philippines—South-East Asia and Australasia

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Cardiovascular diseases remain the Philippines’ leading cause of mortality, with hypertension as a prevalent contributory risk factor. We took part in May Measurement Month 2017 (MMM17), a global initiative to raise awareness of high blood pressure (BP) and to serve as a temporary solution to the lack of screening programs worldwide. Following the standard MMM protocol, data for 271 604 screened individuals were submitted from the Philippines. After multiple imputation, 91 994 (34.3%) were hypertensive; 28 662 out of 205 158 participants (14.0%) not receiving treatment had hypertension; and of the 60 370 receiving treatment, 25 144 (41.6%) had uncontrolled BP. Blood pressures were significantly higher in the overweight and obese, current smokers, in participants receiving antihypertensive medication, those with previous myocardial infarction or stroke. The BP measurements were relatively lower when taken on the left arm, and in pregnant women. A slightly higher systolic BP was noted in participants who reported no alcohol intake. Blood pressures recorded during the weekends were highest, and the lowest readings were obtained on Tuesdays. MMM17 was the largest BP screening campaign conducted in the Philippines. Opportunistic BP screening, harnessing volunteers, are a cost-effective public health measure to improve awareness and treatment rates of raised BP. These may help provide additional information that can guide medical practitioners and health officials in drafting preventive and therapeutic measures to improve control rates and long-term outcomes of hypertensive individuals in the population.

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Published on behalf of the European Society of Cardiology. © The Author(s) 2019.

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Introduction

In the Philippines, cardiovascular diseases remain the leading cause of mortality. \(^1\) Hypertension is the biggest contributor to the global burden of disease and to global mortality, accounting for around 10.5 million deaths worldwide annually.\(^2,3\)

The prevalence of hypertension in the Philippines has steadily increased in the past two decades, as shown in the national health surveys.\(^4,5\) The National Nutrition and Health Survey in 2013 (NNHeS 2013) reported a prevalence of 25%.\(^4\) Another local survey conducted by the Philippine Heart Association showed that though there was an improved awareness compared to previous surveys of 76%, only 20% have achieved blood pressure (BP) control.\(^5\) This highlights the need for opportunistic BP screening to diagnose unaware individuals with raised BP and those who are aware but inadequately treated.

The Philippine Society of Hypertension (PSH) joined May Measurement Month (MMM)—a global month-long awareness and screening campaign initiated by the International Society of Hypertension (ISH) to raise awareness on hypertension, and draw attention to the need for more screening programs.\(^6,7\)

Methods

The Philippines was one of 80 countries worldwide that took part in MMM17, using the protocol designed by the ISH. With MMM17 being a laudable global initiative, the ethical clearance requirement was generally waived by the participating institutions. There were over 300 sites nationwide—in the communities, hospitals, pharmacies, schools and existing clinics of individual doctor volunteers—including 169 DOH Barangay (community) health centres, as well as other sites manned by volunteers and partner organizations of the PSH. Training for the volunteers was done via video recordings, with face-to-face training done for volunteers whenever feasible. Aside from the ISH and PSH, a major funding source was LRI-Therapharma, a local pharmaceutical company with a strong advocacy for raising BP awareness. The company undertook the screening in major industrial outlets such as big offices and factories nationwide. Omron Global Healthcare, through its Asia-Pacific Division, donated 3000 digital automatic, upper-arm BP devices.

After kick-off in the presence of eminent politicians, the screening lasted for 38 days, although there were days during the month when it had to be interrupted due to inclement weather or some national security concerns. Heavy multi-media promotions were done, with major mainstream print/digital media, television and radio being very supportive.

Most of the measurements were done using the Omron devices, although a small number used other types of digital device or an aneroid sphygmomanometer. Only a small number used the App developed specifically for MMM17 because of the unavailability of internet in most sites. Data recorded on paper forms were manually transferred to excel spreadsheets by 15 encoders under the supervision of the PSH secretariat. A cursory screening of the data was done locally, but most of the data ‘cleaning’ and analysis was done centrally by the MMM statistical team.\(^7\) Multiple imputation was used to impute the mean of the second and third readings where it was not available. Hypertension was defined as systolic BP (SBP) \(\geq 140\) mmHg and/or diastolic BP \(\geq 90\) mmHg or on antihypertensive treatment.

Results

A total of 271,604 participants’ data were submitted from the various Philippine sites, comprising 22.6% of the global pooled data of 1,201,570 screened individuals.\(^7\) Mean age of participants was 42.6 years with more females (61.1%) than males (37.9%). The majority of the participants were of East Asian descent (77%) with 19% of unknown ethnicity, and 4.3% were South Asians. Out of the total participants, 16,729 (6.2%) had diabetes, 3684 (1.4%) a history of myocardial infarction (MI); and 7015 (2.6%) a history of stroke. 32,995 (12.2%) were current smokers and 27,099 (10%) reported intake of alcohol, once or more per week. The mean body mass index (BMI) of participants was 23.9 kg/m\(^2\) (SD 4). A small proportion of women were pregnant (0.3%).

Out of the 205,041 participants with three readings, the BP decreased on average by 2/0.9 mmHg between the first and third readings (Table 1).

Based on 205,041 participants with all three readings

After imputation, out of 268,490 participants, 91,994 (34.3%) were hypertensive. There were 28,662 out of 205,158 participants (14.0%) that were not receiving treatment who were found to have hypertension. Of the 60,370 participants reporting that they were receiving treatment, 25,144 (41.6%) had uncontrolled BP.

After adjusting for age and sex, BPs were significantly higher for those participants receiving antihypertensive medication and those with previous MI or stroke. Lower BP measurements were noted when taken on the left arm, and in pregnant women (Supplementary material online, Figure S1). Conversely, a slightly higher SBP was noted in participants who reported no alcohol intake (never or rarely) compared to those who took one or more drinks weekly. The obese (BMI \(\geq 30\)) and overweight (BMI \(\geq 25\) and \(< 30\)) also had significantly higher BPs (Supplementary material online, Figure S2). The BP readings also varied during the week, with the highest BPs recorded during the weekends (Saturday and Sunday) and the lowest readings obtained on Tuesdays (Supplementary material online, Figure S3).

Discussion

In this cross-sectional survey, over one-third was found to be hypertensive. Out of the 60,370 participants reporting that they were receiving treatment, 25,144 (41.6%) still had inadequately controlled BP. The figures are similar to what were reported in previous national surveys.\(^4,5\)
showing that a quarter to a third of hypertensive Filipinos do not know that they have elevated BP and less than half of those who are receiving antihypertensive treatment are adequately controlled. This highlights the need for a sustained screening program to diagnose individuals with elevated BP, particularly those who are at risk to develop serious cardiovascular complications. It was also noted in this survey that those with previous MI and stroke still had generally higher BP than their lower-risk counterparts. Such high-risk individuals can be identified also in surveys like this, and referred back to their respective physicians for a more aggressive control of their BP.

With all volunteers working pro bono, the local logistical cost in implementing MMM17 was only around USD 0.31 per participant screened, with one-third of them diagnosed to have elevated BP. This makes the MMM campaign an ideal stopgap solution to the lack of screening programs in the country and worldwide.

There appeared to be a linear correlation between the BPs obtained in this screening and the weight, with obese participants having the highest level of BP compared to those with normal weight or underweight. Current smokers likewise had higher BPs than non-smokers, which was contrary to what was observed in a recent survey in another Asian country. The BP readings appeared to be highest during the weekends particularly Sunday with the lowest BP readings on Tuesday. This may be due to a presumably increased exposure to adverse lifestyle factors during weekends—starting from the Thank God it’s Friday evenings—that may exert a contributory pressor effect. This transient effect may dissipate with the resumption of the work week; hence, the relatively low BP readings on Tuesday. Such a pattern of BP behaviour requires further investigation.

Conclusions and implications

Opportunistic BP screening and sustained public awareness and screening campaigns harnessing volunteers appear to be a cost-effective public health measure to improve awareness and treatment rates of raised BP. Analysis of local data may provide medical practitioners and health officials a better understanding of the profile of their hypertensive population, and guide them in drafting preventive and therapeutic measures to improve treatment and control rates, and long-term outcomes of hypertensive individuals in the population.

Table 1 Differences in mean blood pressure

| Reading 1 | Reading 2 | Reading 3 | Mean readings 1 and 2 | Mean readings 2 and 3 |
|-----------|-----------|-----------|-----------------------|-----------------------|
| Mean systolic BP (mmHg) | 121.1 | 119.7 | 119.0 | 120.5 | 119.4 |
| Mean diastolic BP (mmHg) | 78.8 | 78.2 | 77.9 | 78.6 | 78.2 |

Supplementary material

Supplementary material is available at European Heart Journal - Supplements online.

Acknowledgements

Former Philippine President Joseph Estrada, Health Secretary Paulyn Russell-Ubial, Dr Esperanza Cabral, Dr Dante Morales, Dr Romeo Dinangracia, Dr Abdias Aquino, Dr Nelson Abelardo, Dr Enrique Tayag, Dr Regina Bartolome, Dr Alta Schutte, Dr Markus Schlaich, Dr Maciej Tomaszewski, Dr Petararch Bravo, Dr John Anonuevo, Dr Eugene Reyes, Dr Noemi Pestano, Dr Gina Ogaco, Dr Rogelio Tanco, Dr Joel Abanilla, Dr Anthony Leachon, Dr Willie Ong, Dr Agnes del Rosario, Dr Graciela Garayblas-Monzon, Dr Edgardo Faustino, Dr Arnold Mina, Dr Vinny Mina, Dr Doris Mendoza, Dr Biby Macaya, Dr Sonny Abrahan, Dr Rudy Natividad, Yee Kok Cheong, Dr Greta Cortez, Steve Carpio, Dr Nenita Collantes, Dr Kenneth Hartigan-Go, Dr Chad Rey Carungin, Dr Mario Panaligan, Dr Gina Nazareth, Dr Raul Lapitan, Dr Nannette Rey, Dr Federick Cheng, Dr Elizabeth Caluag, Dr Celbert Jacobo, Rowena Keyser, Carlos Vigare, Herman Esling, Angelica Canlas, Flobert Leonard Barrera, Ronald Jason Binasoy, Sixto Albert Santos, Henry Villamin, Ferdinand Robante, Guilmen Mendoza, UNILAB Employees’ Council, Radney Cequena, Jude Gepte, Love Ballesteros, Chino Martinez, Tabs Vivar, Wally Reyes, Carl Manimtim, Jayjay Miramontes, Homer Rivera, Dr Lila Celino, Nina Allen Gallema, Francisco de Vera, Jermaine Farrah Cepeda, Dr Maia Rostrata, Ramonico Usman, Dr Marilou Espiritu, Dr Aurora Campita, Windalyn Baluis, Dr Joji Jimenez, John Richard La Pascua, Angelie Brook Cezudo, Dr Ma. Sol Villiones, Kristel Charise Daya, Dr Agnes Mobolo, Dr Ian Christian Gonzales, Mary Lynn Ang, Ella Ilagan, Victoria Malidan, Dr Agnes Cullates, Dr Delta Canela, Dr Eshan Pauadac, Aisha Aloha Enampadan, Grace Buenaventura, Donah Marie Maderazo, Cecilia Leonore Pico, Vanessa Arinso, Ronward Reyes, Allan Vincent Villavicencio, Jacinta Scannell, Helen Horsfield, Judith Bunn, Lisa Woodward, Rowena Ramos, Jeanette Lumba, Daisy Mariano, Alvin Jalimao, Dawn Aberilla, Gina Inciong, Angel Mamaril, Charlie Culture, Aimee Agnes, Jay Ferrer, Janice Calaquii, Jerome Torres, Julie Lee, Raymond Gerald Abu, Aileen Manalang, Andrew
Michael Go, Marian Andaluz, Sharmaine Abairientos, Geraldine Perez, and Richard Madlangbayan.

Conflict of interest: The author did not receive any honorarium or compensation of any form in relation to the WMM screening campaign and the papers arising from it but does lecture for Boehringer Ingelheim, Servier, Menarini, LRI Therapharma, UPA Pharma, Sanofi, AsteaZeneca and Torrent and receives modest honoraria for these lectures.

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