MMM18: An Update
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A simple measure to save lives
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The first publication of the May Measurement Month 2017 (MMM17) was recently published1 in The Lancet Global Health. The journal kindly agreed to fast-track the 2017 results, so they were published before MMM18 was over2.

Before summarising the MMM results, the issue of authorship of this first MMM results paper merits discussion. Ideally, we would like to see every volunteer at every site in every country recognised for their efforts. Sadly, that would involve listing thousands of names. In the end, in addition to the central coordinating team whose names appeared on the front page of the article, over 100 Investigators would appear on PubMed in association with the article. We fully appreciate that more people deserve recognition and hope that that recognition will be realised as regional and national publications follow on to describe the MMM17 campaign. We are currently in negotiations with journal editors to consider a supplement which might contain national publications from all/any national leaders who wish to do so.

Rationale and Objectives

MMM was designed to raise awareness of the importance of blood pressure (BP) measurement around the world. This was on the background of raised BP - i.e. not hypertension - being the biggest contributor to the global burden of disease and to global mortality3,4. Since reporting a BP-associated global mortality of about 9.4 million deaths per year as of 20154, this figure has risen to 10.5 million by 2016! Critically, awareness of their condition is reportedly only about 50% among those with hypertension5 and so MMM was set up to address this problem.

How should awareness be evaluated in a cross-sectional survey such as MMM? We targeted the number of countries involved, the number of people screened and the number of screeners detected with BPs possibly requiring intervention or more intervention (≥140 mmHg systolic and/or ≥90 mmHg diastolic). Finally, we wanted to know in how many countries did MMM constitute the largest BP screening ever to have taken place in the individual countries involved.

Results

The brief outcomes in relation to each of these targets were:

- Number of Countries: 100 (If you count UK as England, Northern Ireland, Scotland and Wales)
- Number of adults screened and included in analyses: >1.2 Million
- Number of screeners with untreated BP in the hypertensive range: >150,000
- Number of screeners with treated BP but uncontrolled (≥140mmHg or ≥90mmHg): >100,000
- Number of countries where MMM was the largest screen: 34 of 46 surveyed (74%)

We believe that constitutes strong evidence that our primary aim was achieved!

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The secondary aims of the project included looking at associations between each of the three BP measurements ideally recorded on each screenee and between BPs recorded with various environmental, lifestyle and demographic variables.

This unique database allowed us to evaluate the size of differences between the three BPs taken in series and the effect in making a diagnosis of hypertension based on any one reading versus the mean of the first and second or second and third readings. In short, the mean of two and three looks sensible if only one set of readings is to be used to diagnose hypertension!

We confirmed the usual relationship between systolic and diastolic BP with increasing age, lower BPs in pregnancy, and higher BPs with alcohol intake (>1 unit/week) and increasing BMI. Other findings included higher BPs among those with a history of stroke, those with diabetes, and those on treatment for raised BP. Perhaps less well established findings were of significantly higher BPs among smokers, lower BPs among those with a history of a previous myocardial infarction, and BPs were lower when measured on the right arm and higher on a Saturday with the lowest BPs being on a Tuesday!

**Limitations**

The greatest weakness of the 2017 campaign was the inadequacy of the bespoke MMM App. That was reflected by the fact that only 8% of the data were entered via the 2017 App. The residual 92% were entered – most commonly by hand and then, only variably faithfully in relation to the original questionnaire. Consequently, too many data were lost and/or uninterpretable and we were unable to investigate some variables with confidence. The 2018 App is far superior and should allow much more robust investigation of all variables recorded including additional ones such as the impact of ‘room’ temperature and altitude on BP levels.

Criticisms also include that the data generated were not representative of the countries from which they arose. Consequently, the national prevalence of hypertension in any country cannot be evaluated. However, the campaign was, by design, targeted at those who ‘ideally’ had not had their BPs measured in the previous year and hence MMM was not designed to estimate national prevalence rates nor to compare prevalences across countries.

We were also unable to provide drug treatment or follow-up for those found to have BPs in the hypertensive range (treated or otherwise). The ethical, cost and logistical implications of being able to do so would be enormous and beyond the scope of MMM as it stands. Other concerns include the cost of the project. Having been dependant on volunteer staff and the generosity of investigators worldwide, along with the donation from OMRON of 20,000 BP measuring devices, the cost to ISH worked out at below one US$ per ‘case’ of raised BP (untreated or treated). Health economic analyses are not required to show that this is clearly ‘cost-effective’.

**Prospects**

Looking to the future as a charity with limited income, however, the International Society of Hypertension (ISH) will have to seek external financial support if it wishes to fund MMM beyond 2019. A more complex design, including some components of treatment (beyond advice) and follow-up is beyond the means of ISH. Meanwhile we await the publication of many papers from around the world with more granular data from MMM17 and by September 2018 we hope to have the global results of MMM18 ready for presentation and publication at the next ISH biennial meeting in Beijing in September 2018.

**References overleaf**

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REFERENCES:
2. May Measurement Month (MMM) 2018 Website: www.maymeasure.com

MMM18 in pictures