European Heart Journal Supplements (2024) **26** (Supplement 3), iii58–iii60
The Heart of the Matter
https://doi.org/10.1093/eurheartjsupp/suae055

ESC
European Society
of Cardiology

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

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KEYWORDS
Hypertension;
Screening;
COVID-19 pandemic;
Treatment;
Control;
Mexico

May Measurement Month 2021 (MMM21) in Mexico was an opportunistic survey that aimed to improve blood pressure awareness at the individual and population levels and to analyse the impact of the COVID-19 pandemic on the prevalence, knowledge, and rates of hypertension in the country. This survey followed the methodology of MMM, previously published. The total number of participants screened was 77 547, of which 47 793 (61.6%) were female and 29 178 (37.6%) were male. The mean age (SD) was 46.2 (16.6) years. Of all 77 547 participants, 14 939 (19.3%) had hypertension, of which 48% were aware. The frequency and awareness of hypertension in this survey are similar to those reported before the pandemic (MMM19—Mexico and the 2019 National Health Survey), suggesting that the impact of the COVID-19 pandemic in these parameters of arterial hypertension was not as important as expected. These data are concordant with the official reports in Mexico that showed that the pandemic had a severe impact on cardiovascular mortality but did not modify mortality due to hypertension or stroke.

Introduction

High blood pressure (BP) in Mexico, as in the rest of the world, is a major public health problem for those who suffer from it and for public health. High BP is the most prevalent cardiovascular modifiable risk factor for premature death.[1]

May Measurement Month (MMM) is the annual global screening campaign initiated by the International Society of Hypertension in 2017; its main objective is to raise awareness of the need for people to get their BP checked. Mexico participated in MMM in 2017 and 2018 with the support of the Alliance for a Healthy Heart. In 2019 and 2021, the Group of Mexican Experts on Arterial Hypertension (GREHTA) and the Collaborative Group on Arterial Hypertension (GCHA) participated,

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[†]The complete list of participants is given in the Supplementary appendix.

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which substantially increased the number of registered cases.

On 2 February 2020, the first case of the SARS-CoV-2 virus was reported in the country, and the pandemic officially began, so the campaign had to be suspended in that year. The MMM21 Mexico survey was initiated in May 2021, during the second and third waves of the COVID-19 pandemic.

The results of this study provide an opportunity to analyse the impact of the pandemic on the prevalence and awareness rates of hypertension in Mexico.

Methods

May Measurement Month 2021 in Mexico was an opportunistic survey, which followed the methodology previously published.[2] Blood pressure measurements were carried out mainly in 13 first-level care units of social security and in private clinics in 12 states of Mexico. Volunteer doctors performed the physical measurements and medical students, or nurses trained in BP measurement also participated. Informed consent was provided by participants for the collection and use of the results, without writing down personal identification data, to keep the survey within the Mexican Federal Law on Protection of Personal Data Held by Private Parties.[3] Information translated into Spanish was distributed to the participants. For BP measurements, validated semi-automatic measuring equipment, OMRON HEM-9200T, was used, and the pressure measurement guidelines contained in the Official Mexican Standard for the Management of Arterial Hypertension were followed.[4] For each participant, three BP measurements were taken after 5-min rest, separated by 1 min each. The mean of the second and third readings was used for the analyses. The definition of hypertension used was systolic BP $\geq$ 140 mmHg and/or diastolic BP $\geq$ 90 mmHg or if the participant declared to be on treatment for hypertension. For missing data, multiple imputation was used to impute the missing reading, based on data from the global survey.[5] Data were collected between May and September 2021, mainly via an Excel document or in the app provided by MMM21, and were analysed centrally by the MMM project team.

Results

The total number of participants screened in Mexico was 77 547, of which 47 793 (61.6%) were female, 29 178 (37.6%) were male, and 548 (0.7%) did not declare their gender. The mean age (SD) of the participants was 46.2 (16.6) years. In 74 880 (96.6%) participants, all three BP readings were completed.

After multiple imputation, of all 77 547 participants, 14 939 (19.3%) had hypertension, of which 48.0% were aware. The prevalence of hypertension was higher in men (22.8%) than women (17.2%), and increased with age, from 6.3% in those aged 18–29 years to 33.5% in those aged 70 years or more.

Systolic BP increased with age, in both men and women. Until the age of 75, the systolic BP was higher in men, but thereafter the BP in women exceeded that of men. Diastolic BP, in both genders, increased until around the age of 50 years when levels appeared to plateau until a slight progressive decrease began around 60–65 years, with this curve being smoother in women. Consequently, pulse pressure was increased from the age of 40 years (*Figure 1*).

Discussion

The results of this survey, compared with the four probabilistic surveys conducted in Mexico and the previous two MMM surveys, can be seen in *Table 1*. We can compare the results of the survey carried out in 2019 before the pandemic, with the current one carried out by the same group, using the same methodology, and

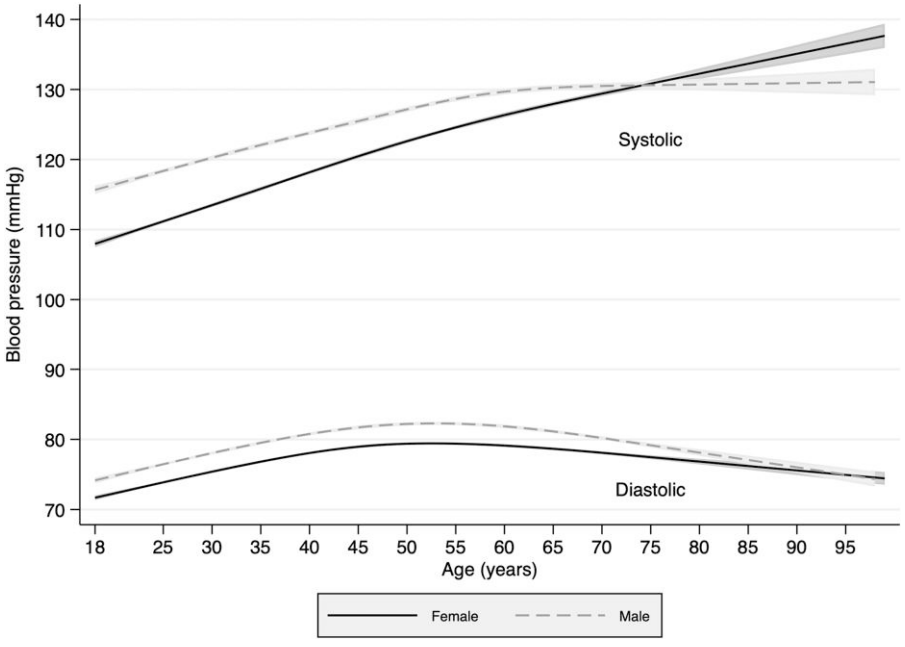


Figure 1 Systolic and diastolic blood pressure in the different age and sex groups of the studied sample.

Table 1 Comparison of the results of May Measurement Month 2021, with the for most recent probabilistic surveys carried out in Mexico and with May Measurement Month 2018 and May Measurement Month 2019

	ENSA 2000	ENSANUT 2012	ENSANUT MC 2016	ENSANUT 10K 2018	MMM18	MMM19	MMM21
Number of participants	39 377	10 898	8352	7838	10 139	39 700	77 547
Prevalence, %	30.5	31.6	25.5	49.2	21.6	25.5	19.3
Knowledge, %	39	50	60	54.7	42	43.7	48

also with information from three probabilistic surveys carried out before the pandemic; that allows us to obtain information about the impact of the COVID-19 pandemic on the health of the population at a time when there was a significant decrease in access to health services originated by the closure of medical establishments and the reconversion of general services to COVID-19 care centres.

The percentage of participants with hypertension was very similar to those before the pandemic, with a decrease to 19.3% when compared with the three nearby surveys that showed similar figures to each other: MMM19,[6] 25.5%; MMM18, 21.6%; and ENSANUT-2016,[7] 25.5%. The awareness rates in MMM21 are higher: (48%) than those of MMM18 (42%) and MMM19 (43.0%). These results are different from those published in some other countries.[8]

The apparent minimal impact of the pandemic on the prevalence and awareness of hypertension, recorded in MMM21, goes in parallel with the mild impact of the pandemic on mortality reported in Mexico from hypertension and stroke.[9] The pandemic strongly impacted cardiovascular mortality, in 2019, 113 653 deaths occurred from heart disease (12.3/10 000) and, in 2021, the number of deaths increased to 176 639 (17.7/10 000, resulting in an excess mortality of 42.3% (calculated by the technique of endemic channels and epidemiological weeks). In contrast, the pandemic had very little impact on mortality from arterial hypertension and stroke (high BP is the most important modifiable risk factor for stroke, associated with 54.0% episodes of stroke worldwide).[10] Mortality from hypertension in 2019 was 16.2% (25 265 cases); in 2020, it was 15.6% (34 193 deaths), and in 2021, it was 13.9% (31 382 deaths). Mortality from stroke in 2019 was 2.8% (35 303 deaths); in 2020, it was 2.9% (37 021 deaths), and in 2021, it was 2.9% (37 169 deaths with an excess mortality of 0.37%.

Conclusion

The COVID-19 pandemic in Mexico in 2021 was the second cause of mortality, with 93 652 deaths, representing 40.8% of excess mortality. The greatest impact of the pandemic occurred in cardiovascular disease mortality; however, arterial hypertension and stroke mortality were modified to a much lesser degree. These data are consistent with the results of this survey, in which the rates of prevalence and knowledge of hypertension, in the most critical period of the pandemic, did not suffer a negative impact. These results are counterintuitive and deserve future in-depth analysis.

Acknowledgements

We thank the people who allowed the measurement and the doctors, nurses, medical, and nursing students who participated without receiving any payment.

Funding

The project received a non monetary donation from OMROM Healthcare MEXICO and SERVIER MEXICO consisted in devices for BP measurement.

Conflict of interest: There is no conflict of interest of any of the authors in the development of this study.

Data availability

The data underlying this article are available in the article and in its online supplementary material.

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