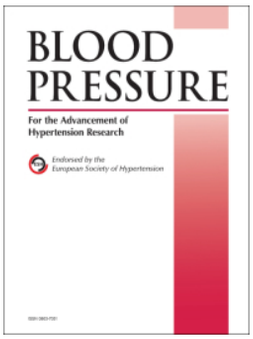

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Prevalence, awareness and therapeutic control of hypertension in Belgium: an opportunistic screening of nearly 6,000 participants during the May Measurement Month campaigns 2017–23

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RESEARCH ARTICLE

Prevalence, awareness and therapeutic control of hypertension in Belgium: an opportunistic screening of nearly 6,000 participants during the May Measurement Month campaigns 2017–23

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ABSTRACT

Background: The May Measurement Month (MMM) initiative is an annual global screening campaign started in 2017 by the International Society of Hypertension highlighting the importance of regular measurements of blood pressure (BP). Here we report on the results of the MMM campaign done in Belgium during the month of May in 2017, 2018, 2019, 2022 and 2023.

Methods: Participants ≥18 years were recruited through opportunistic sampling in 12 sites (mostly hospital entrances) across Belgium. Apart from standardised BP recordings by trained staff, data were collected on demographics, lifestyle factors and comorbidities. Hypertension was defined as raised BP (systolic BP ≥140 mmHg and/or diastolic BP ≥90 mmHg) and/or taking antihypertensive medication.

Results: Data were collected from 5,926 participants aged 51.5 years on average. Mean (SD) systolic and diastolic BP were 125.9 (17.6) mmHg and 79.4 (10.9) mmHg with 25.8% exceeding the 140/90 mmHg threshold. Age-standardised prevalences of hypertension were 45.4% in men and 36.9% in women. Among the 2,468 individuals with hypertension, 78.5% had been previously diagnosed and 1,578 of those with known hypertension, received antihypertensive treatment. Only about half of those being treated (56.3%) did achieve the target of systolic/diastolic BP <140/90 mmHg. Inadequate therapeutic control was independently associated with increasing age and higher body mass index. Untreated hypertension was significantly associated with male sex, age, body mass index and alcohol use.

Conclusion: Despite the limited representativeness of the sample, these data suggest that the 'rule of halves' for hypertension no longer holds true in Belgium and that therapeutic control of hypertension is still suboptimal.

PLAIN LANGUAGE SUMMARY

- The societal burden of high blood pressure remains very high
- Since early detection can significantly mitigate further complications, adequate screening is crucial
- According to the May Measurement Month screening campaign done in Belgium during recent years, prevalences of hypertension were found to be 45% in men and 37% in women.
- About 30% of persons with hypertension are unaware of their condition
- Therapeutic control of hypertension remains inadequate with approximately 4 out of 10 of treated patients failing to achieve their target blood pressure

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KEYWORDS

Hypertension; screening; population; treatment; awareness

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- It is increasingly important to develop strategies that promote drug and lifestyle adherence and improve its effectiveness in order to mitigate the risk of complications, including heart disease and stroke

Introduction

Despite the availability of effective treatment strategies, arterial hypertension remains a global public health challenge, placing millions of individuals at increased risk for cardiovascular diseases [1]. While it disproportionately affects populations in low- and middle-income countries, the prevalence of hypertension and its therapeutic management remain suboptimal in many high-income nations [2–5]. Recent data from the World Health Organisation reveal that in Belgium, approximately 26% of women and 34% of men aged 30 to 79 years are hypertensive [6]. Alarmingly, an estimated third of these individuals may be unaware of their condition [6]. Given that early detection can significantly mitigate further complications, adequate screening is crucial to reduce the burden of high blood pressure (BP). The May Measurement Month (MMM, maymeasure.org) initiative is an annual global screening and awareness campaign emphasising the importance of routine BP measurements in the general population [7–10]. In this paper, we present the overall findings from the MMM campaign conducted in Belgium between 2017 and 2023.

Methods

May Measurement Month (MMM) is a global initiative organised by the International Society of Hypertension (ISH) aimed at raising awareness of hypertension and the need for BP screening [8]. These annual opportunistic cross-sectional surveys have emerged as an important source of blood-pressure-related information both nationally and globally. In Belgium, the measurement campaigns took place in the month of May in 2017, 2018, 2019, 2022 and 2023. Due to the COVID-19 pandemic, the survey was deferred in 2020 and 2021.

Recruitment

Participants ≥ 18 years were recruited through opportunistic sampling in 12 sites (mostly hospital entrances, see Supplementary Table 1). Any person entering the hospital, either referred patients, or hospital personnels, or visitors could be proposed to participate after giving their informed consent. At each site, tables and two chairs per table were set up at the hospital entrance for participants to complete the MMM questionnaire on demographics, lifestyle factors and comorbidities [9–10]. While completing the questionnaire, participants were positioned with their backs supported, legs uncrossed, and feet flat on the floor for a duration of five minutes. A screening booth was set up behind a curtain to facilitate blood pressure measurements in a tranquil setting, conducted by qualified nurses or trained medical students.

Measurements

Blood pressure was assessed using an automated electronic device (mainly Omron type M6) with participants in a sitting position [11–12]. The arm selected for measurement, preferably the left arm, was positioned comfortably on a table. Utilising the correct cuff sizes, three readings of blood pressure were recorded with a one-minute interval between measurements. Participants were instructed to refrain from speaking during and between the blood pressure assessments. Systolic and diastolic blood pressures were calculated as the mean of the last 2 of 3 readings. A high blood pressure was defined as a SBP ≥140 mmHg and/or a DBP ≥90 mmHg. Blood pressures in the range 130-139 mmHg for SBP and/or 80-89 mmHg for DBP were considered as 'high normal'. A participant was formally labelled as hypertensive if blood pressure was high (SBP ≥140 mmHg and/or a DBP ≥90 mmHg) and/or the participant was taking antihypertensive medication. Undiagnosed hypertension was defined as a high blood pressure at the time of the screening event without a self-reported history of hypertension. Similarly, untreated hypertension was defined as high blood pressure without the use of antihypertensive drugs. Finally, blood pressure was therapeutically controlled if SBP <140 mmHg and DBP <90 mmHg under current antihypertensive medication.

Questionnaire data

Data on basic demographics, relevant medical history and lifestyles were obtained through a one page questionnaire completed prior to the BP measurements. All information was self-reported and fully anonymised for

further processing. Data were coded and transferred electronically into an Excel spreadsheet. Body Mass Index was calculated from self-reported height and weight.

Statistical methods

All data are summarised according to means (standard deviation) and proportions (%). Age-standardised prevalence rates were calculated using the overall Belgian population as on 1st January 2023 as reference. To explore independent associations between participants' characteristics and the presence of untreated hypertension and uncontrolled treated hypertension, multiple logistic regression models were fitted. Adjusted odds ratios were calculated from these models together with their 95% confidence intervals. P-values were derived from Wald chi-square statistics. An alpha-level of 0.05 was used to conclude statistical significance. All data analyses were done using SAS software (release 9.4) at the Department of Public Health and Primary Care, Ghent University.

Ethical procedures

Local coordinators successfully secured approvals from Ethics Committees at all participating sites.

Results

Data of 3,735 (63.0%) women and 2,191 men were available for our analyses. Participants were aged 51.5 years on average and in about 90% of Caucasian ethnicity (Table 1). The sample included 15% subjects aged < 30 years and 15% was aged ≥ 70 years. About 9% was diagnosed with diabetes and less than 5% of participants reported a history of myocardial infarction or stroke. Prevalences of smoking and obesity were 16% and 17% respectively, while less than half reported to consume alcohol at least once a week.

Overall, 4 in 5 participants (81.4%) had their blood pressure measured during the past year and 1 in 4 were using antihypertensive drugs at the time of the screening (Table 2). Mean (SD) systolic and diastolic blood pressures were 125.9 (17.6) mmHg and 79.4 (10.9) mmHg. As depicted in Figure 1, average blood pressures were higher in men; SBP increased linearly with age while DBP dropped from the age of 60 years onwards. A quarter (25.8%) presented with high blood pressure, i.e. SBP/DBP ≥140/90 mmHg with figures being slightly higher in men. Blood pressures were high normal in 26.7% and exceeded the 160/100 mmHg threshold in 6.7%. The prevalences of undiagnosed hypertension by sex and age are shown in Figure 2. Overall, 14.6% of participants (11.1% in women, 21.4% men) without a previous diagnosis of hypertension were found to exceed the SBP/DBP threshold of140/90 mmHg.

Table 1. Distribution of participants' characteristics by gender – MMM Belgium.

	Women	Men	All
	N = 3,735	*N* = 2,191	*N* = 5,926
Age			
< 30 yr	15.2% (569)	13.4% (294)	14.6% (863)
30-39 yr	12.3% (459)	10.1% (222)	11.5% (581)
40-49 yr	16.8% (629)	14.4% (315)	15.9% (944)
50-59 yr	22.8% (850)	19.0% (417)	21.4% (1,267)
60-69 yr	20.2% (756)	23.4% (513)	21.4% (1,269)
≥ 70 yr	12.6% (472)	19.6% (430)	15.2% (902)
Mean (SD)	50.3 (16.6)	53.5 (17.4)	51.5 (16.9)
Non-Caucasian ethnicity	8.8% (328)	12.3% (268)	10.1% (596)
Body Mass Index			
< 25 kg/m^2	55.6% (1,765)	41.9% (793)	50.5% (2,558)
25-29 kg/m^2	28.7% (911)	39.4% (746)	32.7% (1,657)
≥ 30 kg/m^2	15.6% (496)	18.7% (354)	16.8% (850)
Mean (SD)	25.2 (5.0)	26.5 (4.2)	25.7 (4.7)
Current smoking	15.0% (560)	17.7% (387)	16.0% (947)
Alcohol			
Never or rarely	41.8% (1,552)	32.1% (700)	38.2% (2,252)
Less than once a week	23.0% (853)	18.1% (395)	21.2% (1,248)
At least once per week	35.3% (1,311)	49.8% (1,084)	40.6% (2,395)
History of diabetes	7.3% (271)	11.1% (240)	8.7% (511)
Previous myocardial infarction	1.8% (66)	5.8% (126)	3.3% (192)
Previous stroke	3.0% (113)	4.4% (97)	3.6% (210)

The age-standardised prevalences of hypertension were 36.9% and 45.4% in women and men respectively and were linearly increasing with age (Table 3 and Figure 3). Among those aged <30 years, 10.5% were hypertensive. Women were slightly more aware of their hypertensive status (72.2%) than men (65.4%) and about 25% of those aware were untreated. Overall, 58.1% of treated subjects were controlled according to the <140/90 mmHg threshold. Despite antihypertensive treatment, still 12.5% presented with a very high blood pressure exceeding a SBP level of 160 mmHg or a DBP level of 100 mmHg. Blood pressure was under control (<140/90 mmHg) in 50.4%, 50.4% and 49.5% in participants using 1, 2 or 3 different antihypertensive drugs respectively. As shown in Figure 4, therapeutic BP control was rather consistent across ages. Finally, untreated hypertension was significantly more common in men and positively related to age, body mass index and alcohol consumption (Table 4). Unsuccessful therapeutic control was positively associated with age and body mass index.

In a comparison of our MMM data obtained in pre-COVID-19 and post-COVID-19 years, we observed no change in the overall prevalence of hypertension (42.1% in 2017-2019 vs 40.8% in 2022-2023, $p = 0.38$). However, the use of antihypertensive drugs dropped

Table 2. Distribution of blood pressure characteristics – MMM Belgium.

	BP measured last year	Actual systolic/diastolic BP ≥ 130/80 mmHg	≥ 140/90 mmHg	≥ 160/100 mmHg	Antihypertensive drug use
ALL					
Age- & sex-standardised (95% CI)	81.4% (79.0%-83.8%)	52.5% (50.7%-54.4%)	25.8% (24.5%-27.1%)	6.7% (6.1%-7.4%)	25.2% (23.9%-26.5%)
Crude	82.4% (4652)	54.0% (3201)	26.7% (1580)	6.8% (405)	26.6% (1578)
< 30 yr	71.3% (577)	28.7% (248)	8.9% (77)	1.4% (12)	2.4% (21)
30-39 yr	71.4% (464)	38.3% (261)	13.2% (90)	3.5% (24)	6.2% (42)
40-49 yr	76.9% (675)	50.0% (472)	20.8% (196)	5.3% (50)	15.3% (144)
50-59 yr	86.4% (1041)	59.3% (751)	28.1% (356)	6.7% (85)	29.7% (376)
60-69 yr	88.5% (1081)	65.6% (832)	34.9% (443)	8.4% (107)	39.6% (503)
≥ 70 yr	92.3% (814)	70.6% (637)	46.3% (418)	14.1% (127)	54.5% (492)
WOMEN					
Age-standardised (95% CI)	83.0% (79.9%-86.1%)	48.5% (46.1%-50.8%)	23.3% (21.6%-25.0%)	6.7% (5.8%-7.7%)	24.4% (22.7%-26.1%)
Crude	83.2% (2947)	48.2% (1800)	22.3% (833)	6.3% (234)	23.6% (880)
< 30 yr	75.3% (399)	26.7% (152)	7.6% (43)	1.8% (10)	3.3% (19)
30-39 yr	74.7% (328)	33.6% (154)	10.7% (49)	3.5% (16)	5.4% (25)
40-49 yr	79.3% (457)	44.2% (278)	17.2% (108)	5.1% (32)	13.8% (87)
50-59 yr	86.2% (695)	52.0% (442)	22.4% (190)	5.5% (47)	27.1% (230)
60-69 yr	88.5% (644)	59.4% (449)	30.0% (227)	8.1% (61)	35.3% (267)
≥ 70 yr	91.6% (424)	68.9% (325)	45.8% (216)	14.4% (68)	53.4% (252)
MEN					
Age-standardised (95% CI)	78.1% (74.2%-81.9%)	60.7% (57.4%-64.0%)	31.1% (28.8%-33.4%)	7.0% (5.9%-8.0%)	27.0% (24.9%-29.0%)
Crude	81.1% (1705)	63.9% (1401)	34.1% (747)	7.8% (171)	31.9% (698)
< 30 yr	63.8% (178)	32.7% (96)	11.6% (34)	0.7% (2)	0.7% (2)
30-39 yr	64.5% (136)	48.2% (107)	18.5% (41)	3.6% (8)	7.7% (17)
40-49 yr	72.2% (218)	61.6% (194)	27.9% (88)	5.7% (18)	18.1% (57)
50-59 yr	86.7% (346)	74.1% (309)	39.8% (166)	9.1% (38)	35.0% (146)
60-69 yr	88.6% (437)	74.7% (383)	42.1% (216)	9.0% (46)	46.0% (236)
≥ 70 yr	93.1% (390)	72.6% (312)	47.0% (202)	13.7% (59)	55.8% (240)

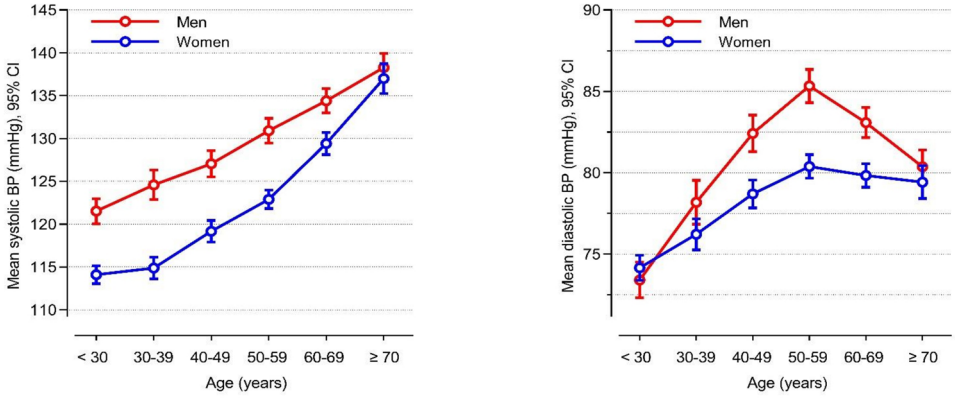

Figure 1. Mean systolic and diastolic blood pressure by sex and age – MMM Belgium.

slightly (28.0% in 2017-2019 vs 24.1% in 2022-2023, $p = 0.0011$) but the drop in the control of hypertension was striking and highly significant (60.5% in 2017-2019 vs 47.0% in 2022-2023, $p < 0.0001$).

Discussion

The rather worrying epidemiological evidence regarding hypertension in Belgium, as outlined in the 2021 WHO report, indicates a pressing need for the implementation of effective screening strategies [6]. These are crucial for a better understanding of the prevalence of high blood pressure, which is a critical step in reducing its overall burden. Considering this perspective, nationwide screening efforts may be regarded as the most valid instruments. In Belgium, MMM screening campaigns were implemented in 2017, 2018, 2019, 2022, and 2023, providing epidemiologists and public health authorities with a substantial amount of blood pressure-related data. Here we are disclosing the outcomes of these campaigns for the first time.

In developing the different screenings, we adhered to the simple 'six-step guide to National-Scale Hypertension Control Program implementation' as outlined by Cazabon et al. [13]. This guide recommends the implementation of blood pressure measurement stations at registration desks and in areas with high foot traffic, thereby providing all patients visiting the facility with the chance to have their blood pressure evaluated [13]. Consistent with the MMM protocol, we implemented

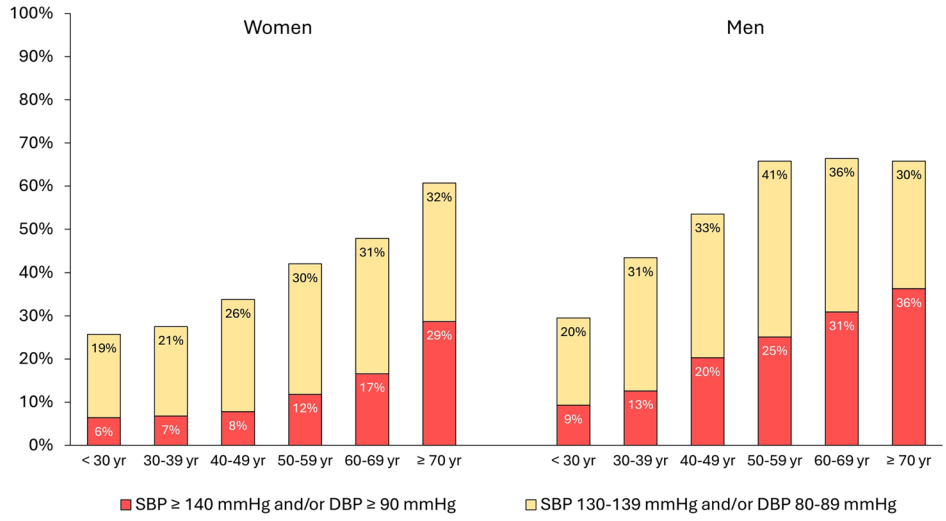

Figure 2. Distribution of blood pressure in participants without a previous diagnosis of hypertension by sex and age – MMM Belgium.

Table 3. Prevalence of hypertension, awareness, treatment and therapeutic control – MMM Belgium.

				Therapeutic control of blood pressure		
	Hypertension* % (n)	Awareness** % (n)	Treated if aware*** % (n)	< 130/80 mmHg % (n)	< 140/90 mmHg % (n)	< 160/100 mmHg % (n)
ALL						
Age- & sex-standardised (95% CI)	39.7% (38.1%-41.3%)	69.4% (65.3%-73.4%)	75.3% (69.2%-81.4%)	31.8% (25.9%-37.6%)	58.1% (50.9%-65.3%)	87.5% (78.9%-96.2%)
Crude	41.6% (2468)	78.5% (1938)	81.4% (1578)	29.3% (462)	56.3% (888)	88.0% (1389)
< 30 yr	10.5% (91)	37.4% (34)	61.8% (21)	52.4% (11)	66.7% (14)	90.5% (19)
30-39 yr	16.6% (113)	55.8% (63)	66.7% (42)	26.2% (11)	54.8% (23)	83.3% (35)
40-49 yr	29.9% (282)	72.0% (203)	70.9% (144)	24.3% (35)	59.7% (86)	86.8% (125)
50-59 yr	46.6% (590)	81.7% (482)	78.0% (376)	32.7% (123)	62.2% (234)	91.0% (342)
60-69 yr	58.5% (742)	82.3% (611)	82.3% (503)	29.2% (147)	59.4% (299)	90.7% (456)
≥ 70 yr	72.1% (650)	83.8% (545)	90.3% (492)	27.4% (135)	47.2% (232)	83.7% (412)
WOMEN						
Age-standardised (95% CI)	36.9% (34.8%-39.0%)	72.2% (66.8%-77.6%)	78.9% (70.8%-87.0%)	35.1% (28.3%-41.8%)	60.1% (51.7%-68.5%)	87.3% (77.4%-97.2%)
Crude	36.1% (1350)	80.1% (1081)	81.4% (880)	33.5% (295)	58.8% (517)	87.8% (773)
< 30 yr	9.8% (56)	41.1% (23)	82.6% (19)	57.9% (11)	68.4% (13)	94.7% (18)
30-39 yr	13.9% (64)	57.8% (37)	67.6% (25)	28.0% (7)	60.0% (15)	80.0% (20)
40-49 yr	25.6% (161)	78.3% (126)	69.0% (87)	25.3% (22)	60.9% (53)	86.2% (75)
50-59 yr	40.9% (348)	83.3% (290)	79.3% (230)	40.0% (92)	68.7% (158)	92.6% (213)
60-69 yr	51.9% (392)	83.7% (328)	81.4% (267)	34.5% (92)	61.8% (165)	89.5% (239)
≥ 70 yr	69.7% (329)	84.2% (277)	91.0% (252)	28.2% (71)	44.8% (113)	82.5% (208)
MEN						
Age-standardised (95% CI)	45.4% (42.6%-48.1%)	65.4% (59.4%-71.4%)	67.9% (59.8%-76.1%)	19.7% (14.8%-24.6%)	52.2% (35.0%-69.4%)	82.1% (63.8%-99.8%)
Crude	51.0% (1118)	76.7% (857)	81.4% (698)	23.9% (167)	53.2% (371)	88.3% (616)
< 30 yr	11.9% (35)	31.4% (11)	18.2% (2)	0.0% (0)	50.0% (1)	50.0% (1)
30-39 yr	22.1% (49)	53.1% (26)	65.4% (17)	23.5% (4)	47.1% (8)	88.2% (15)
40-49 yr	38.4% (121)	63.6% (77)	74.0% (57)	22.8% (13)	57.9% (33)	87.7% (50)
50-59 yr	58.0% (242)	79.3% (192)	76.0% (146)	21.2% (31)	52.1% (76)	88.4% (129)
60-69 yr	68.2% (350)	80.9% (283)	83.4% (236)	23.3% (55)	56.8% (134)	91.9% (217)
≥ 70 yr	74.7% (321)	83.5% (268)	89.6% (240)	26.7% (64)	49.6% (119)	85.0% (204)

*Hypertension defined as SBP ≥ 140 mmHg and/or DBP ≥ 90 mmHg and/or using AHT drugs.
**Proportion of participants with hypertension reporting a previous diagnosis.
***Proportion of patients with a previous diagnosis of hypertension that is currently treated.

approved devices and recruited trained volunteers in the collection of the readings to strengthen the robustness and reliability of the data [14]. The highly standardised MMM methodology allows a straightforward comparison of our campaign results with those from other Western European countries. In the MMM 2019 campaign, data revealed a crude hypertension prevalence of 43.6% among 46,881 participants from all over Europe [15]. After adjusting for age and sex based on the World Health Organisation's world-standard population structure, the standardised prevalence was 36.2%. Here we report an age-and sex-standardised prevalence of 39.7%, placing Belgium approximately in the middle of the prevalence spectrum for various European countries based on measurements taken between 2017 and 2023. The highest prevalence rates were recorded in Austria (54.6%) and Spain (50.0%), while the lowest were found in Switzerland (32.7%) and the UK and

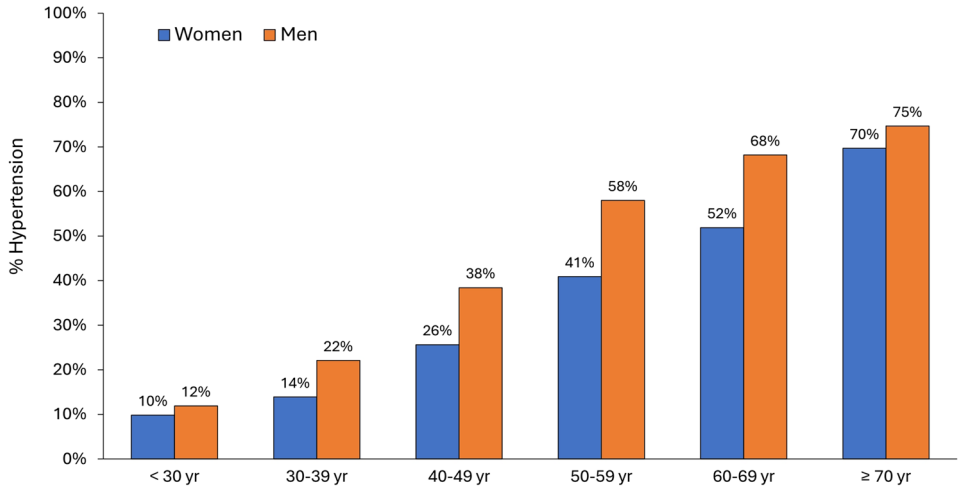

Figure 3. Prevalence of hypertension by sex and age – MMM Belgium.

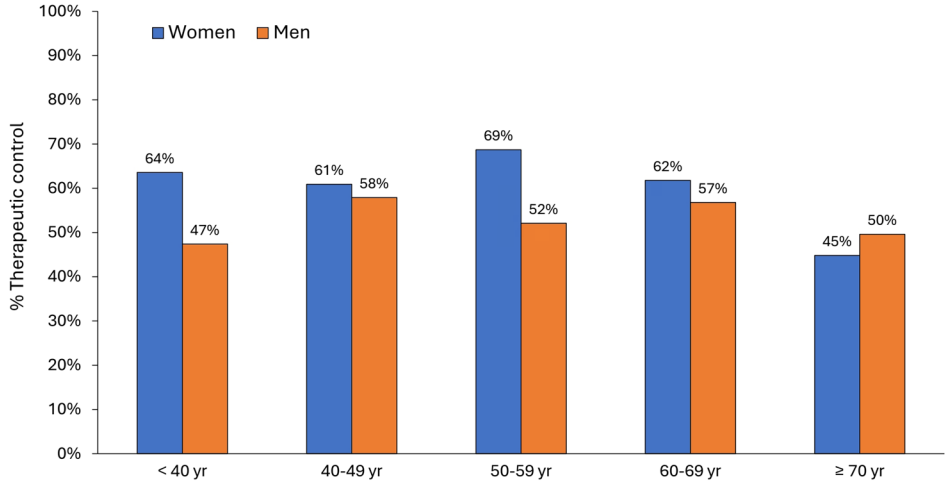

Figure 4. Therapeutic control of hypertension by sex and age – MMM Belgium.

Ireland (33.4%) [16–19]. The observed gender differences in age-standardised hypertension prevalences in our study align with MMM data from most other European countries, showing that prevalences in men are 5-10% higher than in women. This gender disparity, irrespective of age, suggests the presence of potential biological and behavioural factors that may influence blood pressure regulation differently in men and women.

The high prevalence of undiagnosed hypertension, particularly among men (21.4% vs. 11.1% in women), highlights a critical gap in hypertension diagnosis. This deficiency is further reflected by the relative low hypertension awareness rate of 69.4% (65.4% in men and 72.2% in women). Nevertheless, these statistics suggest that the traditional 'rule of halves' is no longer applicable in Belgium. This epidemiological principle, established in the 1970s, posits that 1) half of those with hypertension remain undiagnosed, 2) among those diagnosed, half do not receive treatment, and 3) of those treated, half fail to achieve adequate blood pressure control [20,21]. While the first two aspects of this rule appear clearly outdated, the final aspect still holds true, as evidenced by our local MMM data indicating that only 58.1% of treated individuals achieved control under the <140/90 mmHg threshold. Even more strikingly, despite receiving antihypertensive treatment, still 12.5% presented with a very high blood pressure exceeding a SBP level of 160 mmHg and/or a DBP level of 100 mmHg. Given the availability of effective antihypertensive medications, this concerning finding reinforces evidence produced by various European nations that highlights the ongoing need to substantially increase all efforts to enhance treatment adherence and promote suitable lifestyle modifications, such as reducing salt intake and implementing rigorous weight management strategies by adopting more stringent or personalised treatment plans.

Table 4. Independent associations between participants' characteristics and untreated hypertension and uncontrolled treated hypertension.

	Untreated hypertension	Uncontrolled treated hypertension
	Adjusted Odds Ratio (95% CI), P-value*	Adjusted Odds Ratio (95% CI), P-value*
Male gender	1.73 (1.45-2.08), $p<0.001$	1.14 (0.91-1.43), $p=0.27$
Age (per 10 years)	1.42 (1.34-1.50), $p<0.001$	1.24 (1.12-1.37), $p<0.001$
Non-Caucasian ethnicity	1.00 (0.74-1.34), $p=0.99$	1.22 (0.82-1.82), $p=0.33$
Current smoking	0.85 (0.66-1.09), $p=0.19$	1.02 (0.74-1.39), $p=0.92$
Alcohol use at least once/week	1.33 (1.11-1.60), $p=0.002$	1.09 (0.86-1.38), $p=0.47$
Body Mass Index (per 5 kg/m^2)	1.71 (1.55-1.89), $p<0.001$	1.18 (1.06-1.32), $p=0.004$
History of diabetes	0.75 (0.51-1.10), $p=0.14$	0.83 (0.62-1.10), $p=0.19$
Previous myocardial infarction	0.70 (0.35-1.44), $p=0.34$	0.98 (0.66-1.46), $p=0.93$
Previous stroke	0.84 (0.45-1.56), $p=0.58$	1.24 (0.83-1.85), $p=0.30$
BP measured last year	0.99 (0.80-1.24), $p=0.94$	0.92 (0.55-1.54), $p=0.76$

*From multiple logistic regression models.

Our analysis confirms the significant role of body mass index in relation to high blood pressure. Among the obese participants, 68% were diagnosed with hypertension, and 16% of these individuals were not aware of their condition (results not shown). The identification of body mass index as the leading independent risk factor for untreated hypertension indicates a pressing requirement for more comprehensive blood pressure screenings in overweight individuals in non-clinical environments, including workplaces and pharmacies.

The vast majority (90%) of participants in our research identified as Caucasian, which limited our ability to assess hypertension rates among non-Caucasian individuals. Nevertheless, we found that about half (49%) of the 199 black participants were observed to have hypertension, an observation fully consistent with previous findings [22].

The COVID-19 pandemic profoundly impacted the annual MMM campaign, leading to its cancellation in Belgium for the years 2020 and 2021. In the two years following the pandemic, 2022 and 2023, we noted significantly lower hypertension control rates, which seem to reflect global MMM findings [23]. This decline in therapeutic control may be attributed to various factors. The lockdowns and stress associated with the pandemic likely resulted in decreased physical activity, unhealthy eating habits, and lower adherence to treatment protocols, all of which can adversely affect blood pressure control. Furthermore, the pandemic caused a decrease in face-to-face medical consultations and a transition to telehealth services, potentially hindering regular blood pressure monitoring and management.

Like other MMM campaigns, our study has the methodological strength of relying on a standardised protocol for blood pressure measurement in an opportunistic setting, ensuring consistency across different screening sites. Also, the use of validated blood pressure devices by trained personnel enhanced the accuracy of the measurements obtained. Finally, the large sample size allowed us to present robust data about the prevalence, awareness and control of hypertension. On the other hand, the opportunistic nature of the screenings, mainly carried out at hospital sites throughout Belgium, may have introduced selection bias, as those who participated (visitors, hospital staff, patients) might differ systematically from those who did not, hence affecting the generalisability of our findings. Also, information on medical history, treatment and lifestyles was self-reported and not validated. Finally, MMM campaigns are typically cross-sectional by nature and hence limited in their ability to identify potential causal associations.

In summary, the recognition and management of hypertension in Belgium have significantly improved over the last few decades, rendering the traditional rule of halves obsolete. Nevertheless, therapeutic control remains inadequate with approximately 4 out of 10 of treated patients failing to achieve the target blood pressure of less than 140/90 mmHg. These statistics underscore the persistent difficulties in effectively managing hypertension, despite advancements in awareness and diagnosis. It is increasingly important to develop strategies that promote drug and lifestyle adherence and improve its effectiveness in order to mitigate the risk of complications, including heart disease and stroke.

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