Hypertension Prevalence, Awareness, Treatment, and Control in Mozambique

Urban/Rural Gap During Epidemiological Transition

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Abstract—The prediction of cardiovascular risk profile trends in low-income countries and timely action to modulate their transitions are among the greatest global health challenges. In 2005 we evaluated a nationally representative sample of the Mozambican population (n=3323; 25 to 64 years old) following the Stepwise Approach to Chronic Disease Risk Factor Surveillance. Prevalence of hypertension (systolic blood pressure ≥140 mm Hg and/or diastolic blood pressure ≥90 mm Hg and/or antihypertensive drug therapy), awareness (having been informed of the hypertensive status by a health professional in the previous year), treatment among the aware (use of antihypertensive medication in the previous fortnight), and control among those treated (blood pressure <140/90 mm Hg) were 33.1% (women: 31.2%; men: 35.7%), 14.8% (women: 18.4%; men: 10.6%), 51.9% (women: 61.1%; men: 33.3%), and 39.9% (women: 42.9%; men: 28.7%), respectively. Urban/rural comparisons are presented as age- and education-adjusted odds ratios (ORs) and 95% CIs. Among women, hypertension (OR: 2.0; 95% CI: 1.2 to 3.0) and awareness (OR: 4.3; 95% CI: 1.9 to 9.5) were more frequent in urban areas. No urban/rural differences were observed in men (hypertension: OR: 1.3, 95% CI: 0.9 to 2.0; awareness: OR: 1.5, 95% CI: 0.5 to 4.7). Treatment prevalence was not significantly different across urban/rural settings (women: OR: 1.4, 95% CI: 0.5 to 4.4; men: OR: 0.3, 95% CI: 0.1 to 1.4). Control was less frequent in urban women (OR: 0.2; 95% CI: 0.0 to 1.0) and more frequent in urban men (OR: 78.1; 95% CI: 2.2 to 2716.6). Our results illustrate the changing paradigms of "diseases of affluence" and the dynamic character of epidemiological transition. The urban/rural differences across sexes support a trend toward smaller differences, emphasizing the need for strategies to improve prevention, correct diagnosis, and access to effective treatment. **(*Hypertension*. 2009;54:77-83.)**

Key Words: hypertension ■ prevalence ■ awareness ■ treatment ■ Mozambique ■ Africa

Hypertension is the largest risk factor for cardiovascular diseases, growing in prevalence and poorly controlled virtually everywhere.[1] Prevention is possible, although rarely achieved, and treatment can lead to a reduced incidence of complications, including stroke, coronary heart disease, heart failure, and kidney disease. By 2030, 23 million cardiovascular deaths are projected, with ≈85% occurring in low- and middle-income countries.[2]

Studies published from 1980 through 2003 show that the prevalence of hypertension remained stable or decreased in developed countries and increased in developing countries.[1] Data reported after 2000 on the prevalence, awareness, treatment, and control of hypertension show no significant cross-sectional differences between developed and developing countries in these indices, except for a 6.5% lower mean prevalence in developing than in developed countries among men.[3] However, recent epidemiological data on the prevalence of high blood pressure from African national representative samples are scarce.[1,3]

Some of the greatest challenges in global health are predicting how the cardiovascular risk profile of populations from low- and middle-income countries will develop and taking timely action to modulate their transition, namely in the sub-Saharan African countries at the earliest stage of the epidemiological transition,[4] taking into account the evolving paradigms of diseases of affluence[5] and the dynamic character of the changes between and within countries.[4] In contrast with body mass index and cholesterol, blood pressure is not correlated with economic factors, and differences between urban and rural areas have varied, sometimes even taking opposite directions.[5] We aimed to quantify the prevalence, awareness, treatment, and control of arterial hypertension in the Mozambican adult population and to compare these estimates between urban and rural areas of residence within the country.

Methods

For the present community-based cross-sectional study, a sample of adults aged 25 to 64 years was assembled using the sampling frame

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of the 1997 census, which was designed to be representative at a national level and by place of residence (urban or rural).[6] Ninety-five geographical clusters were selected, among which all of the households were listed and 25 randomly selected and visited. All of the eligible subjects in the same household were invited for the study. Fifty-five subjects refused to participate, and 3323 were evaluated between September and November 2005.

Subjects were evaluated following the World Health Organization Stepwise Approach to Chronic Disease Risk Factor Surveillance (STEPS), which included a questionnaire on sociodemographic and behavioral factors (including smoking and drinking habits), medical and health history, and physical measurements (including blood pressure, weight, height, and waist circumference), using standardized methods.[7] The World Health Organization STEPS instrument for noncommunicable disease risk factors (core and expanded version 2.1[8]) was used for data collection, after translation to Portuguese.

Blood pressure was measured on a single occasion by nonphysician trained interviewers using a semiautomatic sphygmomanometer (Omron 3) with an appropriate cuff size. After a 5-minute rest, blood pressure was measured twice, 1 minute apart, and a third measurement was performed if the difference between the first 2 was >10 mm Hg for systolic or diastolic blood pressure. For analysis, we used the mean of the 2 measurements or the mean of the last 2 when 3 measurements were done.[7]

Arterial hypertension was defined as systolic blood pressure ≥140 mm Hg and/or diastolic blood pressure ≥90 mm Hg and/or antihypertensive drug therapy in the previous 2 weeks. Hypertensive subjects were considered to be aware of hypertension when having been told by a health professional, in the previous 12 months, that they had hypertension or high blood pressure or when reporting a pharmacological or nonpharmacological treatment for hypertension. Participants reporting having used antihypertensive medication in the previous 2 weeks were considered to be treated pharmacologically for hypertension. Prevalence estimates of treatment among aware hypertensives and among all of the hypertensive subjects are presented. Control was defined as systolic blood pressure <140 mm Hg and diastolic blood pressure <90 mm Hg among treated hypertensive subjects. Prevalence estimates of control among treated hypertensives and among all of the hypertensive subjects are presented.

Nonpharmacological management of hypertension was assessed by asking participants if they were advised to change diet ("special prescribed diet") or to do exercise ("advice to start or do more exercise"), lose weight ("advice or treatment to lose weight"), or quit smoking ("advice or treatment to stop smoking") attributed to hypertension, by indication of a health professional. Close-ended questions were used to ask for any appointment with a traditional healer in the previous 12 months and use of any herbal or traditional remedy attributed to high blood pressure. The classification of the place of residence as urban (in any of the 23 cities and 68 towns) or rural (outside cities or towns) and the definition of categories for the highest level of education attained were done in accordance with the 1997 census.[9]

Anthropometric measurements were obtained with the participant wearing light clothing and no footwear. Body weight was measured to the nearest 0.1 kg using a digital scale and height to the nearest 0.1 cm in the standing position using a portable stadiometer. Body mass index was calculated as weight (in kilograms) divided by squared height (in meters squared) and further divided into the categories defined by the World Health Organization[10]: <25.0 kg/m^2, 25.0 to 29.9 kg/m^2, and ≥30 kg/m^2. Waist circumference was measured to the nearest 0.1 cm, using a constant tension tape, directly over the skin or over light clothing, at the level of the midpoint between the inferior margin of the last rib and the iliac crest in the midaxillary line. For analysis, it was classified according to the Third Report of the National Cholesterol Education Program Expert Panel on Detection, Evaluation and Treatment of High Blood Cholesterol in Adults.[11] Regarding the consumption of any type of alcoholic beverages, participants were classified as noncurrent drinkers and current drinkers (less than weekly or ≥1 day per week).

Statistics

All of the analyses were conducted considering the sampling weights and adjusting for strata and clustering at the primary sampling unit level using Stata version 9.2 (Stata Corp). No race-specific estimates were computed, because 99% of the Mozambican population is black.[12]

Mean systolic and diastolic blood pressures and the prevalence of hypertension, awareness (among the hypertensives), treatment (among all of the hypertensives and among those aware of their hypertension), and control (among all of the hypertensives and among treated hypertensives) were estimated. Adjusted odds ratios (ORs) for the association between place of residence and hypertension, awareness, treatment, and control were computed, with 95% CIs.

Ethics

The study protocol was approved by the National Mozambican Ethics Committee, and written informed consent was obtained from all of the participants.

Results

Characteristics of the Study Sample

The population under study was predominantly rural (two thirds), most subjects were aged <45 years (three quarters), and ≈10% were >54 years of age. Approximately two fifths of the women and one fifth of the men had no formal education, and <10% had secondary or higher education (Table 1).

The overall weighted prevalence of overweight was 11.7%, and 5.2% of the participants were obese. Abdominal obesity was observed in 9.9% of women and 1.5% of men. The proportion of participants drinking alcoholic beverages at least weekly was 16.6%.

Mean Blood Pressure Values

Diastolic blood pressure was significantly higher in urban areas both among women and men, whereas no significant difference was observed for systolic blood pressure. Systolic and diastolic blood pressures increased progressively with age in women and in men. No clear pattern was observed by educational level (Table S1, available in the online data supplement, at http://hyper.ahajournals.org).

Prevalence, Awareness, Treatment, and Control of Hypertension

The prevalence of hypertension was 33.1%, slightly lower in women (31.2%; 95% CI: 25.4% to 37.0%) than men (35.7%; 95% CI: 31.3% to 40.0%; $P=0.023$). Among subjects with hypertension, the prevalence of awareness was 18.4% (95% CI: 12.8% to 24.0%) in women and 10.6% (95% CI: 6.2% to 15.1%) in men ($P=0.007$). Approximately half of the hypertensive subjects who were aware of their condition were treated pharmacologically, and the proportion was approximately twice the number in women (61.1%; 95% CI: 52.0% to 70.2%) as that in men (33.3%; 95% CI: 14.6% to 51.9%; $P=0.021$), corresponding with a prevalence of treatment among all of the hypertensives of 11.2% (95% CI: 7.3% to 15.2%) in women and 3.5% (95% CI: 1.7% to 5.4%) in men ($P<0.001$). Nearly 40% of treated hypertensives fulfilled criteria for control, at 42.9% (95% CI: 30.0% to 55.9%) of women and 28.7% (95% CI: 7.2% to 50.2%) of men ($P=0.269$). The prevalence of control among all of the

Table 1. Sociodemographic Characteristics of the Participants

	Women (n=1800)			Men (n=1281)		
Sociodemographic Characteristics	n	Unweighted, %*	Weighted, %*	n	Unweighted, %*	Weighted, %*
Place of residence						
Urban	893	49.6	30.9	652	50.9	33.0
Rural	907	50.4	69.1	629	49.1	67.0
Age, y						
25 to 34	725	40.3	42.6	470	36.7	35.8
35 to 44	500	27.8	27.9	350	27.3	27.3
45 to 54	367	20.4	18.8	276	21.6	21.1
55 to 64	208	11.6	10.7	185	14.4	15.8
Education, y†						
None	685	38.1	44.7	196	15.3	21.2
1 to 4	642	35.7	37.3	423	33.1	36.1
5	191	10.6	7.5	248	19.4	19.4
6 to 7	164	9.1	6.1	199	15.6	12.2
≥8	115	6.4	4.4	213	16.6	11.2

*Within each variable, the sum of the proportions may not be 100% because of rounding.
†The sum of the number of participants in each category is <1800 for women and 1281 for men because of missing data.

hypertensives was 4.8% (95% CI: 2.8% to 6.8%) in women and 1.0% (95% CI: 0.2% to 1.8%) in men ($P<0.001$; Figure).

Urban/Rural Differences

Among women, the prevalence of hypertension was much higher in urban than in rural areas (41.0% versus 26.8%; $P=0.003$), whereas among men this difference was smaller and nonsignificant (40.0% versus 33.5%; $P=0.145$). Although this pattern was observed for all of the age groups in women, among younger men the prevalence of hypertension was the same in urban and rural areas. Among women, the prevalence of hypertension increased strongly with education in rural areas (0 to 4 years: 27.0%; ≥8 years: 46.8%) and decreased with education in urban areas (0 to 4 years: 45.8%; ≥8 years: 27.2%), whereas among men no difference whatsoever was observed by educational level in rural or urban areas (Table 2).

Men and women with higher body mass index and abdominal obesity had a higher prevalence of hypertension in urban and rural areas. The prevalence of hypertension increased progressively with the frequency of alcohol drinking among women, both from urban and rural areas, whereas no such difference was observed among men (Table 2).

Among women, the association between place of residence and hypertension (crude OR: 1.9; 95% CI: 1.2 to 2.9) was unchanged when adjusting for age and education, and it was attenuated when further adjusted for body mass index (OR: 1.7; 95% CI: 1.1 to 2.7). Among men, the nonsignificant increase in the prevalence of hypertension in urban areas (crude OR: 1.3; 95% CI: 0.9 to 1.9) was unchanged by adjustment for age and education but was attenuated when further taking into account the body mass index (OR: 1.2; 95% CI: 0.8 to 1.7; Table S2). In both sexes, additional adjustment for current drinking did not further change the urban-rural differences, and the association with place of residence was practically the same when adjusting for abdominal obesity instead of body mass index (data not shown).

The proportion of subjects never having measured their blood pressure was higher in rural areas, both among women (55.8% versus 24.9%; $P<0.001$) and among men (81.8% versus 57.0%; $P<0.001$). The proportion of hypertensive subjects aware of their condition was higher in urban regions, ≈2-fold among men (15.2% versus 7.9%; $P=0.138$) and 4-fold among women (32.2% versus 8.9%; $P<0.001$). Although this pattern was observed for all of the age strata among women, younger men showed similar levels of awareness in urban and rural areas. There was a trend for awareness of hypertension to increase with educational level among women from urban and rural areas, and there was no consistent pattern among men (Table 3). The age- and education-adjusted ORs for the association between place of residence and awareness were 4.3 (95% CI: 1.9 to 9.5) for all of the hypertensive women and 2.1 (95% CI: 1.1 to 4.3) when only those having measured their blood pressure before were considered (Table S2).

Among hypertensives aware of their condition, the proportion of drug treatment was higher in women than in men both from urban (women: 63.2%, 95% CI: 55.2% to 71.2%; men: 29.5%, 95% CI: 12.3% to 46.6%; $P=0.006$) and rural areas (women: 55.9%, 95% CI: 31.2% to 80.6%; men: 37.6%, 95% CI: 2.6% to 72.4%; $P=0.400$), with no important difference between urban and rural areas in each sex.

Among hypertensive women under antihypertensive drug therapy, the proportion of blood pressure control was lower in urban than in rural areas (36.0%, 95% CI: 22.8% to 48.3% versus 62.1%, 95% CI: 40.0% to 84.3%; $P=0.055$). Among men, the opposite trend was observed, with a prevalence of control among treated hypertensives much higher in urban than in rural areas (52.3%, 95% CI: 18.4% to 86.3% versus 7.7%, 95% CI: 0.0% to 22.4%; $P=0.043$). Age and education

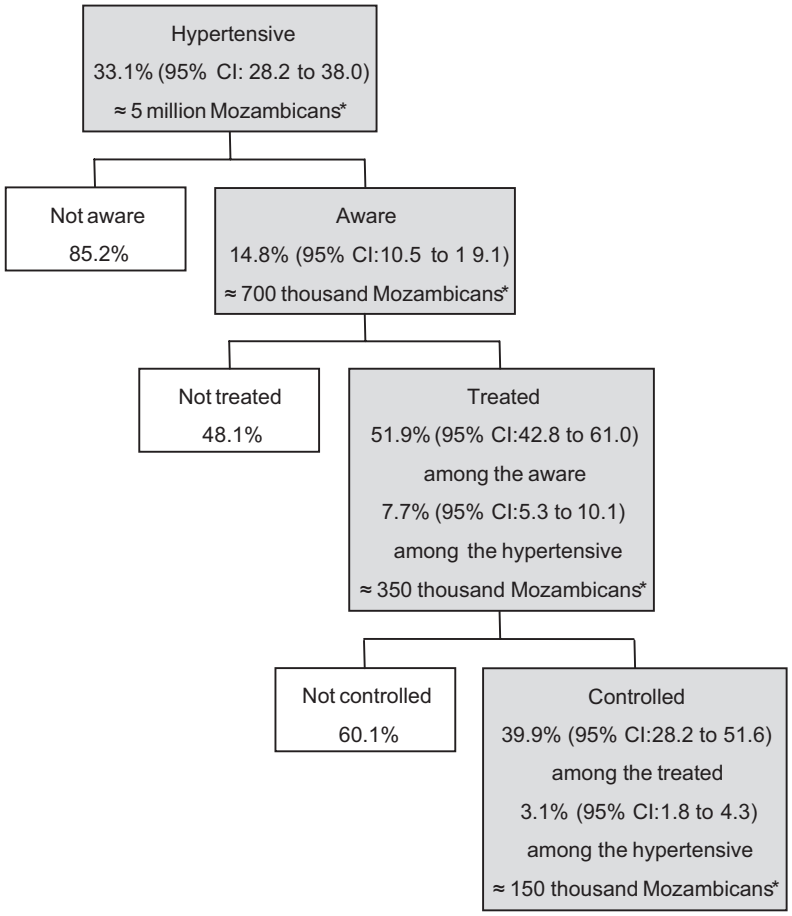

Figure. Prevalence, awareness, treatment, and control of hypertension in the Mozambican population aged 25 to 64 years. *The numbers of Mozambicans with hypertension, aware, treated, and controlled, were estimated by multiplying the prevalence figures by the population aged 25 to 64 years, projected for 2005.[6]

differences across urban and rural areas did not explain the differences observed (Table S2).

Nonpharmacological Management of Hypertension and Use of Herbal/Traditional Remedies

Advice about diet was the most frequently reported lifestyle intervention (9.6%; 95% CI: 6.2% to 13.0%), reported ≈3 times more often than advice about exercise (3.6%; 95% CI: 2.1% to 5.1%) or weight loss (3.5%; 95% CI: 1.6% to 5.4%). Recommendations to quit smoking because of high blood pressure were reported by 1.9% (95% CI: 0.0% to 3.7%) of hypertensive smokers. Nonpharmacological interventions for high blood pressure were reported almost exclusively by patients who were also receiving drug therapy (Table 4).

The proportion of hypertensive subjects having had an appointment with a traditional healer in the previous year was 1.8% (95% CI: 0.7% to 2.8%), higher among those treated pharmacologically for hypertension (10.6% versus 1.0%; $P<0.001$). Among all of the hypertensives, the prevalence of current use of herbal/traditional remedies was 1.4% (95% CI: 0.6% to 2.1%), also higher among those under pharmacological treatment (10.2% versus 0.6%; $P<0.001$).

Discussion

One third of Mozambican adults aged 25 to 64 years were hypertensive, but <15% of these subjects were aware of their condition, among which half were under pharmacological treatment. Forty percent of treated hypertensives fulfilled the criteria for control. Urban-rural differences were observed in accordance to what was expected in a country in epidemiological transition, with urban areas presenting a higher prevalence of hypertension and awareness but age- and sex-specific estimates suggesting a trend toward smaller differences.

Despite the limitations of direct comparisons because of methodological heterogeneity, our estimates of mean blood pressure in Mozambique are in the upper range of contemporary data from Africa,[13–18] especially regarding systolic blood pressure, which translates into similarly high prevalence of hypertension. In surveys conducted under the STEPS methodology, the prevalence of arterial hypertension ranged from 8.2% in Ethiopia[15] to 36% in women and 44% in men from the Republic of Seychelles.[19]

Hypertension was more frequent in urban areas, especially in women. Among younger men the prevalence was similar in both settings. Regarding the relation with education, we observed mixed patterns, ie, rural areas depicting a higher prevalence among the more educated, characteristic of the less developed countries, and urban areas with higher prevalence among the less educated, but only among women. Taken together, these observations suggest that the position of this population regarding stages of epidemiological transition is heterogeneous, with men moving ahead of women and urban areas moving ahead of rural areas, at least in what concerns the inversion of the relation with education.[4]

The urban-rural differences remained after adjustment for age, education, and obesity, and the uneven distribution of

Table 2. Prevalence of Hypertension Among Women and Men From Urban and Rural Areas According to Age, Education, Body Mass Index, Waist Circumference, and Current Alcohol Drinking

	Hypertension							
	Women				Men			
	Urban		Rural		Urban		Rural	
Participant Characteristics	%	95% CI	%	95% CI	%	95% CI	%	95% CI
All participants	41.0	36.4 to 45.7	26.8	19.5 to 34.1	40.0	34.0 to 46.1	33.5	27.8 to 39.2
Age, y								
25 to 34	17.6	12.7 to 22.5	11.1	5.9 to 16.2	31.8	25.0 to 38.6	32.8	26.4 to 39.2
35 to 44	43.2	31.8 to 54.5	27.1	18.8 to 35.5	35.3	25.7 to 44.9	27.7	18.8 to 36.6
45 to 54	69.5	57.6 to 81.3	45.5	35.6 to 55.4	49.8	39.6 to 60.1	32.0	20.3 to 43.7
55 to 64	73.0	64.0 to 81.9	57.9	44.9 to 70.9	59.4	38.3 to 80.5	46.0	46.0 to 60.8
Education, y								
0 to 4	45.8	38.0 to 53.6	27.0	19.7 to 34.3	42.7	26.3 to 59.1	33.7	26.1 to 41.3
5 to 7	37.6	32.4 to 42.9	18.5	7.6 to 29.4	39.0	28.3 to 49.7	32.8	21.8 to 43.8
≥8	27.2	20.8 to 33.6	46.8	4.6 to 89.0	38.3	29.5 to 47.2	35.0	4.0 to 66.0
Body mass index, kg/m^2								
<25.0	33.0	29.4 to 36.7	25.6	18.7 to 32.4	34.4	29.3 to 39.6	30.5	23.8 to 37.2
25.0 to 29.9	54.1	45.2 to 63.1	42.2	26.1 to 58.2	53.9	39.6 to 68.2	62.5	48.3 to 76.7
≥30	54.9	44.5 to 65.3	31.8	8.4 to 55.1	78.6	67.0 to 90.2	89.7	66.6 to 100.0
Waist circumference, cm								
Women <8 and men <102	38.0	33.2 to 42.8	27.4	19.9 to 34.9	38.3	32.5 to 44.1	32.5	27.0 to 38.0
Women ≥8 and men ≥102	60.0	50.4 to 69.6	50.9	26.1 to 75.7	79.3	65.3 to 93.2	100	*
Current drinking								
No	40.4	33.8 to 47.0	24.4	16.2 to 32.6	37.8	28.9 to 46.8	28.5	23.1 to 33.9
<1 d/wk	40.3	33.6 to 47.0	33.0	23.3 to 42.8	43.4	33.2 to 53.6	35.4	20.7 to 50.2
≥1 d/wk	48.2	33.1 to 63.3	34.6	20.1 to 49.1	38.6	27.7 to 49.5	40.5	31.4 to 49.6

*Only 1 subject was in this category.

other important risk factors for high blood pressure may account for the observed differences. Diet and physical activity are only partially accounted for by body mass index, and salt intake is expectedly lower in rural areas.

In Mozambique, the prevalence of awareness is the lowest reported in recent African surveys,[18–25] much below the average in developing countries[3] (40.6% in men and 52.7% in women), but the prevalence of treatment was higher than that observed in some African studies relying on the STEPS methodology.[18,20,21]

These results are in accordance with Mozambique being one of the poorest countries in the world, with scarce human

Table 3. Awareness of Hypertension Among Women and Men From Urban and Rural Areas According to Age and Education

	Awareness of Hypertension							
	Women				Men			
	Urban		Rural		Urban		Rural	
Sociodemographic Characteristics	%	95% CI	%	95% CI	%	95% CI	%	95% CI
All Participants	32.2	22.7 to 41.7	8.9	4.9 to 12.9	15.2	8.2 to 22.2	7.9	2.1 to 13.7
Age, y								
25 to 34	12.2	3.6 to 20.8	7.6	0.9 to 14.2	3.3	0.0 to 6.7	5.9	0.0 to 13.8
35 to 44	35.8	22.0 to 49.5	6.6	0.8 to 12.5	16.3	3.2 to 29.4	13.9	0.0 to 34.9
45 to 54	39.4	24.1 to 54.6	12.3	5.5 to 19.1	17.5	4.7 to 30.4	9.5	1.1 to 17.9
55 to 64	33.3	17.8 to 48.8	8.0	1.8 to 14.3	30.1	18.0 to 42.3	3.6	0.0 to 8.5
Education, y								
0 to 4	28.6	16.8 to 40.5	8.5	4.5 to 12.5	17.6	9.5 to 25.7	4.5	0.5 to 8.5
5 to 7	34.9	23.1 to 46.7	12.9	0.0 to 29.7	10.3	2.2 to 18.4	16.9	1.6 to 32.1
≥8	51.9	36.4 to 67.4	13.1	0.0 to 43.4	18.7	5.0 to 32.4	10.3	0.0 to 32.3

Table 4. Nonpharmacological Approaches to the Management of Hypertension, by Indication of a Health Professional, According to Pharmacological Treatment

Nonpharmacological Management of Hypertension	Among the Hypertensives					
	All		Not Treated Pharmacologically		Treated Pharmacologically	
	%	95% CI	%	95% CI	%	95% CI
Diet	9.6	6.2 to 13.0	4.2	2.0 to 6.5	74.3	64.4 to 84.2
Exercise	3.6	2.1 to 5.1	1.7	0.7 to 2.6	26.3	16.8 to 35.9
Weight loss	3.5	1.6 to 5.4	1.8	0.0 to 3.6	24.0	16.9 to 31.1
Quit smoking*	1.9	0.0 to 3.7	1.2	0.0 to 2.8	70.8	21.7 to 100.0

*Data refer to hypertensive smokers.

resources and deficient sanitary network coverage,[26] and are corroborated by our observation that a high proportion of participants never had their blood pressure measured. The nonpharmacological approaches to the management of hypertension and the use of herbal/traditional remedies were observed mainly among those treated pharmacologically, confirming that a large proportion of subjects are not receiving any support for the management of hypertension.

Both awareness and pharmacological treatment were nearly twice as frequent in women, and among those treated the prevalence of control was >1.5 times higher in women. These results fit into the overall context of developing countries[3,19,22] and may be largely explained by a more frequent contact of women with health services because of maternal and child health programs.

Awareness was less frequent in rural settings, showing no consistent variation with age or with education, probably reflecting the high proportion of subjects never having measured their blood pressure, especially among men and in the rural areas, as supported by the attenuation of the urban/rural difference from 4- to 2-fold in women and the inversion of the association in men when only those having measured their blood pressure before are considered. Urban-rural differences were observed in Ghana,[27] but there was no such pattern in Tanzania.[25]

The prevalence of control was higher than the average in developed and in developing countries.[3] This may be explained by the assessment of pharmacological treatment considering the use of antihypertensive medication in the previous 2 weeks, which reflects the persistence of treatment and contributes to the underestimation of treatment prevalence and consequent overestimation of control. However, it was also higher than in recent African STEPS surveys.[19,20]

The interpretation of sex and urban-rural differences on both treatment and especially on the control of hypertension also needs to consider the limited treatment options available for most Mozambican patients, as well as the regional differences in the access to a continuous supply of antihypertensive drugs. β-Blockers or angiotensin-converting enzyme inhibitors are not easily accessible through the public sector. Hydrochlorothiazide and methyldopa (the only antihypertensive drugs included in the kits used for regular supply of medicines to primary health care) are the main drugs used to treat hypertensive patients in rural areas and may account for a low proportion of men under persistent treatment and poorer adherence, resulting in a very low prevalence of control in rural men. The use of diuretics seems more frequent in women, independent from the indications and contraindications of the different antihypertensive drugs.[28] In the Republic of Seychelles, almost half of men and a quarter of women admit not taking the prescribed treatment for high blood pressure.[19] In urban areas, patients have easier access to private care and secondary and tertiary healthcare levels, resulting in a wider offer of antihypertensive drugs, which may explain the urban/rural differences in control among men, as well as smaller sex differences observed in the urban setting among the treated. Also, the more frequent rupture of stocks of medicines[26] and the lack of alternative supply in the rural areas may further contribute to explain the lower prevalence of control in rural areas, in both sexes.

In conclusion, our results illustrate the changing paradigms of diseases of affluence and the dynamic character of epidemiological transition. The urban/rural rural differences across sex, age, and education levels suggest a trend toward smaller differences and confirm the double burden of disease in one of the poorest countries in the world.

Perspectives

The low proportion of people aware, treated, and controlled emphasizes the importance of developing strategies for primary prevention, correct diagnosis, and the urgency to increase the access to effective treatments options.

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Disclosures

None.

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