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HYPERTENSION PREVALENCE AND GAPS IN THE CARE CASCADE AMONG ADULTS IN NIGERIA: A SECONDARY ANALYSIS OF PUBLISHED NATIONAL ESTIMATES WITH EVIDENCE FROM PLATEAU STATE

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ABSTRACT
Hypertension is a leading modifiable risk factor for cardiovascular disease, stroke and kidney failure, and Nigeria needs a consolidated view of where patients are lost along its care cascade. This descriptive secondary analysis combined two published national sources: the World Health Organization (WHO) 2025 country profile for Nigeria (adults aged 30–79 years; 2024 estimates) and the Removing the Mask on Hypertension (REMAH) nationwide survey of 4,192 adults (2017–2018). Prevalence, awareness, treatment and control were extracted, and cascade conversion rates and attrition were derived from the published figures. Global, African and Nigerian literature and three Plateau State studies were used to interpret the findings. No individual-level data were analysed. WHO estimates that 22.0 million adults aged 30–79 years have hypertension, of whom 50% are diagnosed, 32% are treated and 13% are controlled. Of the 19.1 million with uncontrolled hypertension, about 11.0 million (58%) are undiagnosed. In REMAH, the age-standardised prevalence was 38.1% and ranged from 20.9% in the North Central zone to 52.8% in the South East zone. It rose from 6.8% in adults under 30 years to 63.0% in those aged 70 years and above. Prevalence was similar in urban and rural residents (39.2% vs 37.5%), but treatment was higher in urban residents (40.9% vs 30.8%). Awareness was higher in women than in men (63.3% vs 52.8%). Plateau State studies reported prevalence of 32.2% to 41.9% with large undiagnosed fractions, but none described the full cascade. The largest loss in the care cascade occurs at detection, with further and roughly equal losses between diagnosis and treatment and between treatment and control. Stronger screening and continuity of treatment in primary care, state-level cascade surveys and individual-level analyses of the predictors of poor control are priorities.

Keywords: hypertension; prevalence; awareness; treatment; blood pressure control; care cascade; Nigeria; Plateau State

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Introduction

Hypertension is defined by the World Health Organization (WHO) as a systolic blood pressure of 140 mmHg or higher, a diastolic blood pressure of 90 mmHg or higher, or current use of antihypertensive medication (WHO, 2025a). It is a leading modifiable cause of stroke and heart failure. It also drives coronary artery disease and chronic kidney disease (WHO, 2025b; Zhou et al., 2021). Because the condition is often silent, detection depends on routine measurement. WHO estimated that 1.4 billion adults aged 30–79 years lived with hypertension in 2024 and that fewer than one in five of them (about 320 million) had it adequately controlled (WHO, 2025a).

Global evidence shows that the burden now falls most heavily on poorer settings. Mills et al. (2020) reported that hypertension prevalence was higher in low- and middle-income countries than in high-income countries, and Sarki et al. (2015) showed a high pooled prevalence across low- and middle-income countries. A pooled analysis of 1,201 population-representative studies found that the number of adults aged 30–79 years with hypertension doubled between 1990 and 2019 and that treatment and control remained lowest in sub-Saharan Africa and some other regions (NCD Risk Factor Collaboration, 2021). Nationally representative data from 44 low- and middle-income countries showed that only about 39% of adults with hypertension had been diagnosed, about 30% were treated and about 10% were controlled (Geldsetzer et al., 2018). The multinational PURE study described similar attrition (Chow et al., 2013).

Africa mirrors this pattern. Twagirumukiza et al. (2011) projected a steep rise in hypertension across sub-Saharan Africa as populations age and urbanise. Bosu et al. (2019) reported a high pooled prevalence among older adults in Africa. Ataklte et al. (2015) documented a large burden of undiagnosed hypertension in sub-Saharan Africa, and Bosu (2015) reached a comparable conclusion for workers in West Africa, where awareness and control were low. Effective treatment exists in the region. A multi-country African trial that included Nigerian sites showed that dual therapy built on amlodipine lowered blood pressure more effectively than the combination of perindopril and hydrochlorothiazide in Black African patients (Ojji et al., 2019).

Nigeria has the largest population in Africa and carries a large share of the regional burden. Ogah et al. (2012) reviewed five decades of research and reported prevalence figures from 8% to 46.4%, with a pooled prevalence that rose from 8.6% in the 1970s to 22.5% in 2000–2011. Adeloye et al. (2015) and Akinlua et al. (2015) confirmed high prevalence and wide variation between studies. Adeloye et al. (2021) estimated a crude prevalence of 30.6% and pooled crude awareness, treatment and control rates of 29.0%, 12.0% and 2.8%, respectively. They also estimated that the number of affected adults rose by about 540% between 1995 and 2020. The REMAH survey provided the first nationwide estimate based on standard methods: an age-standardised prevalence of 38.1% among 4,192 adults, with marked variation between zones (Odili et al., 2020). A 2026 systematic review pooled 32 studies (49,788 participants) and estimated a prevalence of 34.2% (95% CI 29.6–39.1%), with extreme heterogeneity ($I^2 = 99.1\%$; Nwankwo et al., 2026). Market-based work in Enugu likewise found high prevalence with low awareness (Ulasi et al., 2011).

Plateau State lies in the North Central zone, and its capital is Jos. Local studies point to a considerable burden. In the rural community of Gindiri in Mangu Local Government Area, a prevalence of 40.2% was reported (Tagurum et al., 2015). Among traders in a Jos market, the prevalence was 32.2%, and more than half of the hypertensive traders (55.8%) were unaware of their status (Selowo et al., 2021). Among health workers in a secondary facility in Jos South, the

prevalence was 41.9%, and 35.1% of workers without a prior diagnosis were found to have hypertension (Gyang et al., 2018). These local figures are well above the 20.9% reported for the North Central zone in REMAH, although the populations and methods differ.

Several gaps remain. First, the evidence is fragmented. Global, African and Nigerian sources differ in age range, year and definition, and they are rarely read together as one care cascade. Second, national surveys sample one state per zone, so they cannot describe the cascade within a particular state such as Plateau. Third, the Plateau State studies come from a single community, market or facility, and they focus on prevalence and awareness. None reports the full sequence from diagnosis to treatment and control in the general population. Fourth, pooled estimates are highly heterogeneous, and the size of the loss at each step of the cascade has not been set out in absolute numbers for Nigeria. Fifth, the predictors of poor control cannot be identified without individual-level data, and these are not available in published aggregate reports.

We therefore took a stepwise approach. We anchored the analysis in the most recent WHO national cascade. We added the REMAH survey for regional and sociodemographic detail. We then used Plateau State evidence and the wider African and global literature to interpret the findings. The objectives were (i) to describe the national hypertension care cascade in Nigeria; (ii) to quantify attrition between successive steps of the cascade; (iii) to describe variation in prevalence, awareness, treatment and control by geopolitical zone, residence, sex and age; and (iv) to place the findings in global, African, Nigerian and Plateau State context. We also identify the questions that aggregate data cannot answer, notably the independent predictors of uncontrolled hypertension.

Methods

Study design and reporting

This was a descriptive secondary analysis of published aggregate national estimates. We followed the Guidelines for Accurate and Transparent Health Estimates Reporting (GATHER), which are suited to studies that report health estimates derived from existing data (Stevens et al., 2016). No new data were collected, and no individual-level records were analysed. Two national sources formed the analytic core. The wider literature informed context and interpretation only.

Study setting

The setting was Nigeria. The country has six geopolitical zones: North Central, North East, North West, South East, South South and South West. Plateau State lies in the North Central zone and served as a local reference point for contextual comparison.

Data sources and selection

Two sources were selected as primary because each is national in scope, reports blood pressure thresholds consistent with the WHO definition (140/90 mmHg) and describes steps of the care cascade.

- **WHO 2025 country profile for Nigeria.** The profile appears in Annex 1 of the *Global report on hypertension 2025* (WHO, 2025a). It gives estimates for 2024 among adults aged 30–79 years: the number of adults with hypertension and the percentages diagnosed, treated and controlled.
- **REMAH nationwide survey.** A sample of 4,192 adults was drawn from one rural and one urban community in one state in each of the six geopolitical zones using the WHO STEPwise approach to chronic disease risk factor surveillance. Fieldwork took place in 2017–2018. Prevalence was standardised for age and sex to the 2006 Nigerian census population (Odili et al., 2020).

The 2021 systematic analysis (Adeloye et al., 2021) and the 2026 meta-analysis (Nwankwo et al., 2026) were used only for contextual comparison. They were not pooled with the primary sources.

Contextual literature

Contextual literature was identified through targeted searches of PubMed, African Journals Online (AJOL), Google Scholar and the World Health Organization (WHO) website. Searches covered publications from January 2011 to November 2026, with earlier landmark studies retained where relevant. Search terms included "hypertension" OR "high blood pressure" combined with "prevalence", "awareness", "diagnosis", "treatment", "control", "care cascade", "Africa", "Nigeria", "Plateau State", "Jos" and "Gindiri". Searches were conducted in combinations appropriate to the four contextual levels: global, African, Nigerian and Plateau State. Priority was given to systematic reviews, multinational or national surveys and community-based studies. Plateau State sources were included when the study was conducted in the state and reported a prevalence or awareness estimate for hypertension. This was a purposive search for context and not a systematic review.

Indicators and definitions

Indicator definitions follow each source and are summarised in Table 1. Because the sources differ in population, year and method, their estimates were never combined arithmetically. They are presented side by side.

Table 1. Indicator definitions in the two primary data sources

Indicator	WHO 2025 country profile	REMAH survey (Odili et al., 2020)
Population	Adults aged 30–79 years; estimates for 2024	Adults in a nationally distributed sample (N = 4,192); 2017–2018
Hypertension	SBP ≥140 or DBP ≥90 mmHg or taking antihypertensive medication	SBP ≥140 or DBP ≥90 mmHg or use of antihypertensive medication; prevalence age-standardised to the 2006 census population
Awareness	Percentage of adults with hypertension who are diagnosed	Previous diagnosis of hypertension by a health worker among hypertensive participants
Treatment	Percentage of adults with hypertension who are treated	Self-reported use of prescribed medication for hypertension
Control	Receiving treatment with SBP <140 and DBP <90 mmHg; expressed as a percentage of all adults with hypertension	SBP <140 and DBP <90 mmHg in a participant receiving treatment

SBP systolic blood pressure; DBP diastolic blood pressure. Definitions are taken from the source documents.

Data extraction

Values were transcribed directly from the WHO country profile, the published REMAH report and the Plateau State studies. They were checked against the source documents before analysis. Where a source did not report a value (for example, prevalence in intermediate age groups), it was recorded as not reported and was not estimated or imputed.

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Analysis

The analysis was descriptive and had four parts. First, absolute numbers at each step of the WHO cascade were calculated by applying the reported percentages to the estimated 22.0 million adults with hypertension. Second, cascade conversion rates were derived as the proportion of adults at one step who reached the next (treated divided by diagnosed, and controlled divided by treated). Absolute attrition was calculated as the difference between successive steps. Third, geographical variation was summarised as absolute differences in percentage points and as ratios between zones. Zones were also grouped as northern (North Central, North East and North West) and southern (South East, South South and South West) using simple unweighted means. Fourth, urban–rural and sex differences were reported as published, together with the p-values given by the original authors.

Derived values are approximate because they come from rounded published percentages. Uncertainty was not propagated because the sources do not report the variances needed. Regression modelling, chi-square testing and any analysis of individual-level predictors were not attempted because they require participant-level data and cannot be performed validly on these sources.

Results

National hypertension care cascade

The WHO 2025 profile estimates that 22.0 million Nigerian adults aged 30–79 years have hypertension (Table 2; Figure 1). Half (50%, or 11.0 million) are diagnosed. About 32% (7.0 million) are on treatment. About 13% (2.9 million) have controlled blood pressure. Consequently, 87% (19.1 million) have uncontrolled hypertension.

Table 2. Estimated hypertension burden and care cascade among adults aged 30–79 years in Nigeria, 2024

Indicator	Estimated adults (millions)	Percentage of adults with hypertension
Adults with hypertension	22.0	100
Diagnosed	11.0	50
Receiving treatment	7.0	32
Blood pressure controlled	2.9	13
Blood pressure not controlled	19.1	87

Source: WHO (2025a) Nigeria country profile. Absolute numbers for diagnosed, treated and controlled adults are the published percentages applied to 22.0 million and are approximate.

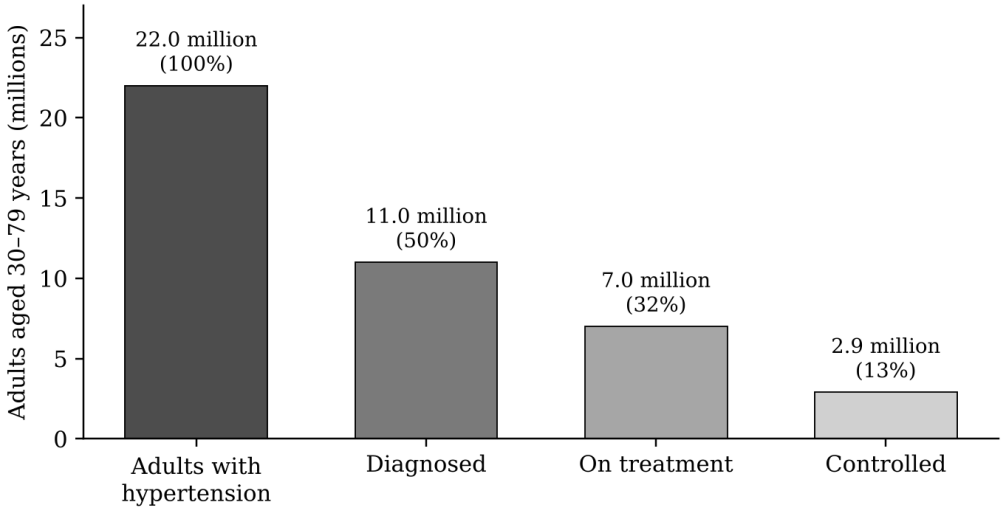

Figure 1. Hypertension care cascade among adults aged 30–79 years in Nigeria, 2024 (WHO, 2025a).

Attrition was substantial at every step (Table 3). Treatment reached 64% of diagnosed adults. Control was achieved in 41% of those treated. Only 26% of diagnosed adults therefore had controlled blood pressure. Of the 19.1 million adults with uncontrolled hypertension, about 11.0 million (58%) had never been diagnosed. About 4.0 million (21%) were diagnosed but not treated, and about 4.1 million (21%) were treated but not controlled.

Table 3. Attrition along the hypertension care cascade in Nigeria, derived from WHO (2025a)

Step	Adults lost (millions)	Share of uncontrolled hypertension (%)
Not diagnosed	11.0	58
Diagnosed but not treated	4.0	21
Treated but not controlled	4.1	21
Total uncontrolled	19.1	100

Conversion rates: diagnosed among all 50%; treated among diagnosed 64% (32/50); controlled among treated 41% (13/32). Values are derived from rounded percentages.

Prevalence across geopolitical zones

In the REMAH survey, age-standardised prevalence was 38.1% nationally and varied more than twofold across zones (Table 4; Figure 2). The South East recorded the highest prevalence (52.8%) and the North Central the lowest (20.9%). The difference was 31.9 percentage points (ratio 2.5). All three southern zones exceeded the national estimate, and all three northern zones fell below it. The unweighted mean was 46.5% for southern zones and 25.1% for northern zones.

Table 4. Age-standardised prevalence of hypertension by geopolitical zone in the REMAH survey, 2017–2018

Geopolitical zone	Prevalence (%)
North Central	20.9
North East	27.5
North West	26.8
South East	52.8
South South	44.6
South West	42.1
National	38.1

Source: Odili et al. (2020). Each zone estimate is based on one rural and one urban community in one state in that zone.

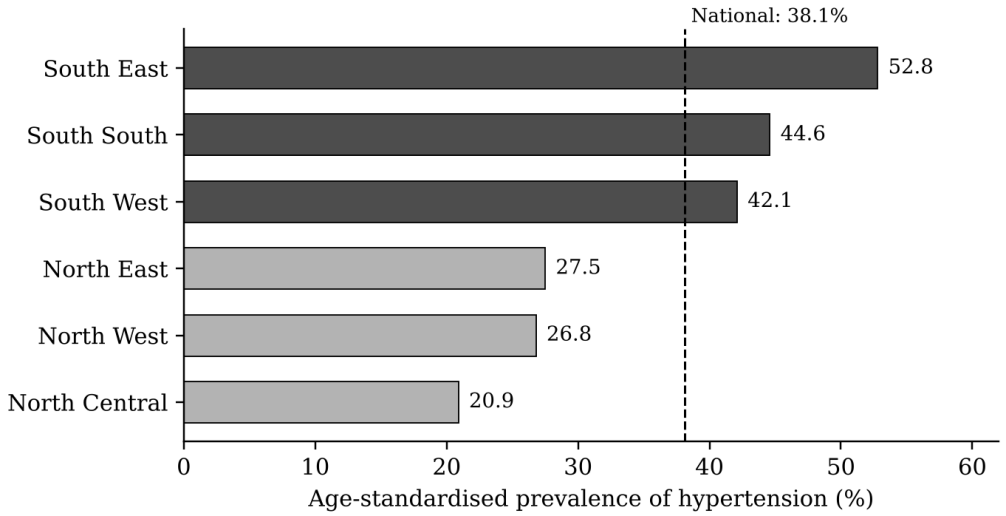

Figure 2. Age-standardised prevalence of hypertension by geopolitical zone in the REMAH survey (Odili et al., 2020). The dashed line marks the national estimate.

Residence and demographic patterns

Prevalence did not differ significantly by place of residence (urban 39.2% vs rural 37.5%; difference 1.7 percentage points; $p > 0.05$). Prevalence rose steeply with age from 6.8% among adults under 30 years to 63.0% among those aged 70 years and above. Estimates for intermediate age groups were not reported in the source and are not presented.

Awareness and treatment were higher in urban than in rural residents (awareness 62.2% vs. 56.6%, $p = 0.0272$; treatment 40.9% vs. 30.8%, $p < 0.0001$). Control was 14.0% in urban and 10.8% in rural residents; this difference was not statistically significant ($p = 0.0727$). Women and men had similar control rates (12.2% vs. 12.5%; $p = 0.8696$). Women were more aware than men (63.3% vs. 52.8%; $p < 0.0001$), while treatment rates were similar (36.7% vs. 34.3%; $p = 0.3573$).

Table 5. Awareness, treatment and control of hypertension by residence and sex in the REMAH survey, 2017–2018 (%)

Indicator	Urban	Rural	Women	Men
Awareness	62.2	56.6	63.3	52.8
Treatment	40.9	30.8	36.7	34.3
Control	14.0	10.8	12.2	12.5

Source: Odili et al. (2020). Control percentages were calculated among all participants with hypertension. The urban–rural control comparison was 14.0% versus 10.8% (p = 0.0727); the women–men comparison was 12.2% versus 12.5% (p = 0.8696). The values are not directly comparable across subgroup dimensions because they represent separate stratified analyses.

Comparison with other national estimates

The REMAH prevalence of 38.1% lies within the 95% confidence interval of the 2026 pooled estimate of 34.2% (29.6–39.1%). The 95% prediction interval of that meta-analysis (13–65%) is wide, which shows that individual studies can differ markedly from the pooled value. The same review found similar pooled prevalence in rural (34.4%) and urban (34.0%) settings (Nwankwo et al., 2026), and this agrees with the REMAH finding. Earlier pooled crude estimates for Nigeria were 29.0% for awareness, 12.0% for treatment and 2.8% for control (Adeloye et al., 2021). The WHO values for 2024 (50%, 32% and 13%) are all higher, although the sources differ in age range, period and method.

Evidence from Plateau State

Three studies from Plateau State were included for context (Table 6). Reported prevalence ranged from 32.2% to 41.9%. Detection gaps were considerable. In the Jos trader study, 55.8% of hypertensive traders were unaware of their status (Selowo et al., 2021). In the health worker study, 35.1% of workers without a prior diagnosis were found to have hypertension (Gyang et al., 2018). All three studies were from single sites, and none described the full cascade through treatment to control.

Table 6. Hypertension studies from Plateau State included for context

Study	Setting and population	Hypertension prevalence	Detection gap reported
Tagurum et al. (2015)	Gindiri rural community; Mangu Local Government Area; adults	40.2%	Not extracted
Selowo et al. (2021)	Rukuba Road market; Jos North; 323 traders; 2019	32.2%	55.8% of hypertensive traders unaware
Gyang et al. (2018)	Vom Christian Hospital; Jos South; health workers; 2015	41.9%	35.1% of workers without a prior diagnosis were hypertensive

The Tagurum et al. (2015) study was consulted directly. It reported a hypertension prevalence of 40.2% among adults in Gindiri; a detection-gap estimate was not reported in the

article and is therefore recorded as "Not reported." All three studies were single-site investigations, and none reported treatment and control steps for the general population.

Discussion

Using the most recent WHO estimates, about 22 million Nigerian adults aged 30–79 years live with hypertension, and only about one in eight has it controlled. The cascade loses people at every step, but the largest single loss is at detection. More than half of the adults whose blood pressure is not controlled have never been diagnosed. The two later losses are each about one-fifth of the uncontrolled total. WHO reports that only four countries worldwide have reached the target of controlling blood pressure in 50% of affected adults (WHO, 2025a). Nigeria's estimated control rate of 13% is far below that benchmark. It is, however, close to the figures reported across 44 low- and middle-income countries (Geldsetzer et al., 2018) and in the multinational PURE study (Chow et al., 2013). This suggests that the Nigerian pattern is typical of many low- and middle-income settings.

The Plateau State health worker study is instructive. Among workers without a prior diagnosis, 35.1% were found to have hypertension (Gyang et al., 2018). The second priority is continuity. Fewer than half of treated adults achieve control, which suggests that starting treatment is not enough. Follow-up, regimen adjustment and uninterrupted access to medicines all matter. Trial evidence shows that effective combination regimens work in Black African patients (Ojji et al., 2019), so poor control at population level probably reflects how services are delivered more than the lack of effective drugs. Our data cannot identify the reasons for loss at each step, and those reasons should not be inferred from aggregate figures.

The REMAH survey showed a clear north–south gradient, with the South East at the top and the North Central at the bottom. This gradient should be read cautiously. Each zone estimate came from one rural and one urban community in a single state, so it describes the sampled state and may not represent the whole zone. The wide prediction interval of the 2026 meta-analysis shows how strongly prevalence depends on where and how it is measured (Nwankwo et al., 2026). Earlier reviews also reported wide variation between Nigerian studies (Adeloye et al., 2015; Akinlua et al., 2015; Ogah et al., 2012). Plateau State illustrates the problem. The REMAH North Central estimate was 20.9%, but local studies in Plateau State reported 32.2% to 41.9% (Gyang et al., 2018; Selowo et al., 2021; Tagurum et al., 2015). These local samples are not representative of the state because they came from traders, health workers and one rural district. Even so, the contrast suggests that a zonal estimate can hide large differences between states and settings. The difference of about 32 percentage points between the extreme zones still supports regionally tailored planning.

The absence of a significant urban–rural difference in prevalence is consistent with the REMAH conclusion that the rural–urban gap reported earlier had narrowed (Odili et al., 2020) and with the similar rural and urban pooled estimates of the 2026 meta-analysis (Nwankwo et al., 2026). Treatment was nevertheless lower among rural residents (30.8% vs. 40.9%), suggesting that access to treatment, rather than disease burden, remained uneven. Women were more likely than men to be aware of their hypertension, but treatment and control rates were similar. Control was 12.2% among women and 12.5% among men ($p = 0.8696$). Higher awareness among women therefore did not translate into a measurable difference at later steps. Age showed the strongest gradient. Prevalence rose to 63.0% among those aged 70 years and above in REMAH, which agrees with the high prevalence reported among older adults across Africa (Bosu et al., 2019). Plateau State studies showed the same direction. Among Jos traders, prevalence increased from 16.9% in the youngest group to 50% in those aged 60 years and above (Selowo et al.,

2021), and among health workers, age above 42 years was a correlate of undiagnosed hypertension (Gyang et al., 2018).

Implications for practice and policy

The findings support integrating routine blood pressure measurement into every adult contact with primary health care. They support stronger systems for follow-up and medicine supply so that treated patients reach control. They support priority for treatment access in rural settings and regular national surveillance that reports the full cascade with regional detail. For Plateau State, the accessible settings in which hypertension was found (markets and health facilities) are practical sites for screening. Selowo et al. (2021) recommended regular screening organised by market authorities. These implications are inferred from the pattern of losses and were not derived from tests of interventions.

Strengths and limitations

The strengths of this study are its transparent use of two complementary national sources, its explicit definitions, its focus on the full care cascade and its multi-level contextualisation from global to Plateau State evidence.

Several limitations should be noted. First, the analysis is based on aggregate estimates, so individual-level associations and causal relationships cannot be examined, and predictors of uncontrolled hypertension could not be analysed. Second, the two primary sources differ in year (2024 vs 2017–2018), age range (30–79 years vs adults) and method (modelled national estimates vs a community survey), so they are not directly comparable and were not pooled. Third, zonal estimates come from one state per zone. Fourth, derived rates are calculated from rounded percentages without uncertainty intervals. Fifth, the REMAH data are now several years old, and the control percentages in the REMAH abstract are internally inconsistent with the full-text results; the full-text subgroup estimates were used. Sixth, the Plateau State studies are small and single-site, and they were identified through a purposive search. Finally, the analysis relies on the accuracy of the published sources.

Future research

The most valuable next step is analysis of an individual-level dataset, for example from the REMAH investigators or a survey available through the WHO NCD Microdata Repository. Multivariable logistic regression should be used to identify the sociodemographic, behavioural and clinical predictors of uncontrolled hypertension, with adjusted odds ratios and 95% confidence intervals. A second priority is a population-based survey in Plateau State that measures the full cascade from detection to control and uses the same definitions as national surveillance. Access to participant-level data would need to be confirmed with the data custodians.

Conclusions

Hypertension is common in Nigeria, and the care cascade shows substantial attrition at every step. About 22 million adults aged 30–79 years are affected, but only about 13% have controlled blood pressure, and the largest single loss is at detection. Prevalence varies widely across geopolitical zones and rises steeply with age. Local evidence from Plateau State shows a high burden and large undiagnosed fractions, but no study has yet described the full cascade in the state. Improving outcomes will require stronger detection and continuity of care in primary health care, state-level cascade surveys and individual-level analyses that identify the predictors of poor control.

Ethical considerations

This study used only published aggregate data that contain no personal identifiers. Ethical approval and informed consent were therefore not required.

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Conflict of interest

The authors declare no competing interests.

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