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From Hypertension Evidence to Health Action in Tanzania - Assessing Research Translation into Policy and Practice Through a Qualitative Evidence Synthesis and Policy Document Analysis

Karim Khani

Kuwaitikarim060@gmail.com

St. Francis University College of Health and Allied Sciences (SFUCHAS)

Tumaini Sojo

St. Francis University College of Health and Allied Sciences

Grace Joachim

St. Francis University College of Health and Allied Sciences

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Abstract

Background

Hypertension remains a major and persistent public health challenge in Tanzania despite substantial research and established national strategies for non-communicable disease (NCD) prevention and control. However, less is known about how locally generated hypertension research is translated beyond publication into policy and health-system action.

Objective

To assess the translation of hypertension research findings into policy and practice in Tanzania by examining research recommendations, their alignment with national priorities, and available evidence of implementation and research utilization.

Methods

A qualitative evidence-synthesis and policy document analysis was conducted. Tanzania-specific hypertension studies published between 2016 and 2026 were identified through PubMed, Google Scholar, and African Journals Online. Of 509 records identified, 202 remained after duplicate removal, 91 underwent full-text assessment, and 25 studies met the inclusion criteria. Recommendations were extracted and categorized into action domains and compared with the National Strategic Plan for Prevention and Control of Non-Communicable Diseases 2021–2026 and relevant health-sector documents. An evidence-to-action pathway was used to assess research recommendations, policy alignment, implementation mechanisms, documented implementation, and health-system response.

Results

The 25 studies generated recurring recommendations across screening and early detection, health education, lifestyle-risk reduction, treatment adherence, service integration, medicine availability, healthcare-worker capacity, primary healthcare strengthening, community interventions, and health information and research. These recommendations showed substantial alignment with national NCD priorities. Evidence also demonstrated implementation through routine NCD reporting and health information systems and selected implementation initiatives. However, national assessments documented persistent gaps in service availability, workforce capacity, medicines, equipment, financing, and utilization of research findings.

Conclusion

Tanzania demonstrates substantial alignment between hypertension research and national policy, but translation into sustained implementation and measurable health impact remains incomplete. Strengthening mechanisms for research synthesis, policy uptake, implementation research, monitoring, and evaluation could help convert hypertension evidence into more consistent and measurable improvements in population health.

1. Introduction

Hypertension remains one of the most important modifiable drivers of cardiovascular disease and premature mortality worldwide[1–4]. Its global burden has continued to expand alongside population ageing, urbanization, obesity, dietary changes and other cardiovascular risk factors [2]. In 2024, an estimated 1.4 billion adults aged 30–79 years were living with hypertension globally, yet fewer than one in five had achieved adequate blood-pressure control [5]. This represents not only a major epidemiological challenge, but also a substantial failure to convert effective, well-established interventions into sustained population-level control.

The challenge is particularly pronounced in low- and middle-income settings, where health systems must respond to increasing cardiovascular risk while facing constraints in access to medicines, diagnostic equipment, trained health workers and continuity of care [6–8]. The World Health Organization's recent global assessment emphasizes that effective hypertension control is achievable, but requires reliable diagnosis, affordable medicines, strengthened primary healthcare, adequate workforce capacity and information systems capable of monitoring treatment and control [3–5]. In sub-Saharan Africa, these challenges occur within a rapidly changing epidemiological environment in which hypertension has become a widespread public-health problem rather than a condition primarily associated with high-income populations [4].

Tanzania reflects this changing landscape. Recent nationally representative evidence from the 2023 Tanzania STEPS survey found raised blood pressure among 23.1% of adults aged 18–69 years, with substantial variation by age, body weight and geographical location. The prevalence

increased from 12.6% among adults aged 18–30 years to 46.4% among those aged 46–69 years, while raised blood pressure was also more common among people who were overweight or obese [9]. These findings complement earlier Tanzanian studies that have reported substantial hypertension burdens across community, clinical and population-specific settings, including a prevalence of 28% among adults in Northern Tanzania [10].

The consequences are increasingly visible within Tanzania's health system. According to the mid-term review of the Health Sector Strategic Plan V, hypertension was the leading contributor to NCD-related mortality recorded at primary healthcare facilities, accounting for 48.9% of NCD mortality in 2022. Hypertension also represented 40.6%, 48.9% and 37.2% of registered NCD patients at primary healthcare facilities in 2021, 2022 and 2023, respectively [11]. These figures demonstrate that hypertension is not merely an epidemiological statistic; it is a continuing and substantial demand on the Tanzanian health system.

Against this background, Tanzania has produced a growing body of hypertension research addressing prevalence, determinants, screening, treatment, adherence, healthcare access, vulnerable populations and health-system preparedness. The present synthesis identified 25 Tanzania-specific hypertension studies published between 2016 and 2026, many of which generated practical recommendations, including improved screening and early detection, health education, lifestyle-risk reduction, integration of hypertension care into existing services, improved medicine availability, strengthened healthcare-worker capacity and community-based interventions [12, 13]. The breadth of these recommendations suggests that Tanzania is not experiencing a complete absence of evidence about what needs to be done.

The more difficult question is what happens after the evidence is generated. Research findings can have limited public-health value if they remain confined to scientific publications, conferences or academic discussions without being synthesized for decision-making, incorporated into feasible policies, adequately resourced, implemented and monitored. Importantly, this concern is not merely theoretical. Tanzania's own mid-term assessment reports that NCD research findings and recommendations have been presented through scientific platforms to inform policy, while also acknowledging that the utilization of research findings and recommendations to improve NCD service delivery and interventions has remained low. The same assessment notes that much NCD research has concentrated on epidemiology, with comparatively limited quality-improvement and implementation research.

Tanzania has nevertheless established an important policy environment for translating evidence into action. The National Strategic Plan for Prevention and Control of Non-Communicable Diseases 2021–2026 prioritizes prevention, early detection, integrated NCD services, health-system strengthening, access to essential medicines, community engagement, surveillance and research [14]. More recent implementation evidence demonstrates progress in incorporating hypertension into routine health information systems and monitoring NCD services, while initiatives such as the PenPlus implementation project have demonstrated potential improvements in primary healthcare capacity for hypertension and diabetes care. At the same time, national assessments continue to identify important gaps in service availability, workforce capacity, medicines, equipment, financing and implementation[14].

This creates a critical evidence-to-action question. The issue is no longer simply whether Tanzania conducts hypertension research or whether research recommendations resemble national priorities. Rather, it is necessary to understand whether research recommendations are reflected in policy, how those priorities are translated into implementation, and whether there is evidence that implementation contributes to meaningful improvements in hypertension prevention and control. This distinction is important because policy alignment alone does not establish that particular research finding influenced a policy decision, while implementation activities alone do not demonstrate population-level impact.

Therefore, this study assessed the translation of hypertension research findings into policy and practice in Tanzania by synthesizing Tanzania-specific hypertension research published between 2016 and 2026, characterizing the recommendations generated by these studies, examining their alignment with the National NCD Strategic Plan 2021–2026, and assessing available evidence of implementation and research utilization. By tracing the pathway from evidence generation to recommendation, policy alignment, implementation and health-system response, this study seeks to identify where translation is occurring, where important gaps remain, and how Tanzania can move from producing evidence about hypertension toward systematically converting evidence into measurable improvements in population health.

2. Methods

2.1 Study design

This study employed a qualitative evidence-synthesis and policy document analysis design to examine the translation of hypertension research into policy and practice in Tanzania. The analysis integrated a structured review of Tanzania-specific hypertension research published between 2016 and 2026 with analysis of national health policy and strategic documents and available evidence of implementation. The study followed an evidence-to-action pathway comprising research evidence generation, recommendation development, policy alignment, implementation, and documented health-system response. This approach enabled assessment not only of what hypertension research has identified, but also of whether and how its recommendations correspond with national priorities and progress toward implementation.

2.2 Study context

The study was conducted within the Tanzanian health-system context, focusing on hypertension as a major non-communicable disease and cardiovascular risk factor. Tanzania has developed national frameworks for NCD prevention and control, including the National Strategic Plan for Prevention and Control of Non-Communicable Diseases 2021–2026 (NCD SP3) and broader health-sector strategic plans. The country was selected as the study context because of the substantial body of locally generated hypertension research alongside continuing challenges in hypertension prevention, detection, treatment and control. The analysis therefore focused on the extent to which locally generated evidence contributes to national policy priorities and documented health-system action.

2.3 Identification and selection of published hypertension research

A structured literature search was conducted to identify hypertension-related studies involving Tanzanian populations and published between 2016 and 2026. Searches were performed in PubMed, Google Scholar, and African Journals Online (AJOL) using combinations of terms related to hypertension and the Tanzanian context, including “hypertension,” “high blood pressure,” “cardiovascular disease,” “non-communicable diseases,” and “Tanzania.” Reference lists of potentially relevant publications were also screened to identify additional eligible studies.

The search identified 509 records. After removal of 202 duplicates, 307 records underwent title and abstract screening. Following this stage, 91 records were retained for full-text assessment, of which 25 studies met the eligibility criteria and were included in the final synthesis.

Figure 1. Flow diagram showing the identification and selection of Tanzania-specific hypertension studies published between 2016 and 2026

2.4 Eligibility criteria

Studies were eligible if they were conducted in Tanzania or included Tanzanian populations, were published between 2016 and 2026, and addressed hypertension or hypertension-related cardiovascular risk. Eligible studies could examine hypertension burden, determinants, prevention, screening, treatment, adherence, healthcare access, service delivery, or health-system preparedness.

To contribute to the evidence-to-action analysis, studies were required to provide recommendations, implications, or proposed actions relevant to policy, clinical practice, public health, healthcare delivery, or health-system improvement. Studies were excluded if they were unrelated to hypertension, lacked Tanzania-specific findings, focused exclusively on laboratory or biological mechanisms without implications for health policy or practice, or did not provide sufficient information for extraction and analysis.

2.5 Data extraction and analysis

A standardized extraction framework was used to capture information from each included study, including author and year, geographical location and region, study population and sample size, study design, main research focus, key findings, and recommendations.

The recommendations were then coded according to their intended area of action. Recurring recommendations were grouped into broader domains, including screening and early detection, health education, lifestyle and risk-factor prevention, treatment adherence and continuity of care, integration of hypertension services, medicine availability and affordability, healthcare-worker capacity, primary healthcare strengthening, community- and population-specific interventions, and health information, monitoring and research.

The frequency and distribution of these recommendation domains were examined across the 25 studies to identify recurring priorities and areas in which hypertension research consistently proposed actionable responses.

2.6 Policy document analysis

National policy and strategic documents relevant to NCD prevention and hypertension control were reviewed to assess the extent to which recommendations emerging from the included studies were reflected in national priorities. Particular emphasis was placed on the National Strategic Plan for Prevention and Control of Non-Communicable Diseases 2021–2026, supplemented by relevant health-sector strategic and implementation documents.

The analysis examined three dimensions: (1) policy alignment, whether research-derived recommendations corresponded with stated national priorities; (2) implementation mechanisms, whether corresponding policy actions had defined strategies, responsible structures, targets, monitoring systems or delivery mechanisms; and (3) documented implementation, whether available national evidence demonstrated that relevant actions had progressed beyond policy commitments into health-system activities.

Importantly, thematic alignment was not interpreted as evidence that a specific policy decision was directly derived from an individual research study unless such a relationship was explicitly documented.

2.7 Assessment of evidence translation

Translation was assessed using a sequential evidence-to-action pathway:

Research evidence → research recommendation → policy alignment → implementation mechanism → documented implementation → measurable health-system or population response.

For each stage, available evidence was examined to determine whether the pathway could be demonstrated and where evidence became limited or uncertain. Policy documents were used to assess formal commitments and implementation mechanisms, while national health-sector reports and other relevant evidence were examined for documented implementation and health-system response.

The analysis distinguished between policy commitment, planned implementation, documented implementation, and demonstrated health outcomes. This distinction was important because the presence of a recommendation within a policy document does not establish direct research uptake, while evidence of implementation does not necessarily demonstrate that the intervention produced measurable population-level improvements.

The final synthesis therefore focused on identifying where translation from research to policy and practice was evident, where it remained incomplete, and where the available evidence was insufficient to establish the link between research, implementation and health outcomes.

3. Results

3.1 Identification and Selection of Studies

The literature search identified 509 records relevant to hypertension research in Tanzania published between 2016 and 2026. Following removal of duplicate records, 202 unique records remained for title and abstract screening. Of these, 91 articles were considered potentially relevant and proceeded to full-text assessment. Following full-text screening against the predefined eligibility criteria, 25 studies met all inclusion criteria and were included in the final synthesis. The study identification and selection process is presented in Fig. 1 using a PRISMA-style flow diagram.

Overall, the screening process progressively narrowed the evidence base from a broad body of potentially relevant literature to a focused set of studies directly addressing the objectives of this study. The 25 included studies therefore constituted the evidence base for subsequent analysis of hypertension research findings, recommendations, policy alignment, and documented translation into practice in Tanzania.

3.2 Characteristics of Included Hypertension Research

The 25 studies included in the final synthesis were published between 2016 and 2026 and represented diverse geographical areas, populations, and research settings across Tanzania. The studies were conducted across the Lake, Northern, Coastal, Eastern, and other zones, with several investigations undertaken in Dar es Salaam, Mwanza, Moshi and the Kilimanjaro Region, Morogoro, and other geographically distinct settings. Nationally representative analyses using the Tanzania Demographic and Health Survey–Malaria Indicator Survey (TDHS-MIS) were also identified, providing evidence across multiple regions of the country. The characteristics of all included studies are summarized in Table 1.

The evidence base comprised predominantly observational studies, particularly cross-sectional and community- or facility-based surveys, complemented by prospective and retrospective cohort studies, qualitative investigations, mixed-methods research, and facility assessments. Study populations varied substantially and included community-dwelling adults, children and adolescents, women of reproductive age, people living with HIV, patients receiving hemodialysis, hypertensive outpatients, emergency department patients, healthcare workers, and community and religious leaders. Sample sizes ranged from small qualitative studies involving 15 healthcare providers to large national survey analyses involving more than 15,000 participants.

The research focus was similarly broad, but most studies concentrated on describing the burden and determinants of hypertension and identifying gaps along the hypertension care continuum. Several studies assessed prevalence, awareness, treatment, and blood pressure control in community populations, while others examined specific populations or clinical settings, including children and adolescents, people living with HIV, patients attending emergency departments, individuals with sickle cell anemia, and patients receiving hemodialysis. Other studies focused more directly on health-system preparedness, access to care, medication adherence, healthcare-provider perspectives, and barriers to effective hypertension management.

Across the included literature, hypertension was consistently identified as an important health problem, although its magnitude varied considerably by population and setting. Reported prevalence ranged from elevated blood pressure among children and adolescents to substantially higher levels among selected adult and clinical populations. Studies also repeatedly identified gaps in awareness, treatment, follow-up, and blood pressure control. For example, several investigations reported substantial proportions of participants with undiagnosed or

uncontrolled hypertension, while facility- and patient-level studies identified challenges related to medication availability, treatment costs, healthcare-provider capacity, continuity of care, and health-system integration [15, 16].

Importantly, the studies did not merely describe the burden of hypertension; most generated recommendations directed toward potential actions at individual, community, health-facility, and policy levels. Common recommendations included strengthening routine and targeted blood pressure screening, integrating hypertension services into existing platforms such as HIV and reproductive health services, improving primary healthcare capacity, ensuring consistent availability of medicines and diagnostic equipment, strengthening healthcare-worker training, improving patient and community education, addressing treatment adherence and affordability, and developing context-specific interventions for underserved populations. Several studies also proposed less conventional approaches, including the use of schools, religious networks, digital health literacy, task-shifting, and culturally sensitive engagement with communities.

Taken together, the included studies demonstrate a substantial and diverse body of hypertension research in Tanzania over the 2016–2026 period. The evidence extends beyond documenting disease prevalence to identifying modifiable risk factors, health-system constraints, barriers to care, and potential intervention pathways. This provided a basis for the subsequent analysis of the extent to which these recommendations correspond with national policy priorities and whether there is documented evidence of their translation into practice.

Table 1. Characteristics, key findings, and recommendations of hypertension studies included in the evidence-to-action analysis, Tanzania, 2016–2026

3.3 Research Recommendations and Proposed Actions

Across the 25 included studies, recommendations were directed toward multiple levels of hypertension prevention, detection, treatment, and health-system response. The recommendations were systematically grouped into ten action domains according to their primary intended area of intervention. Because individual studies frequently proposed more than one action, the domains were not mutually exclusive; consequently, the percentages represent the proportion of the 25 included studies contributing to each domain and do not sum to 100% (Table 2).

Screening and early detection was the most frequently identified action domain, appearing in 15 of the 25 studies (60%). Recommendations included routine blood-pressure screening, targeted screening of high-risk populations, school-based screening, and earlier identification of undiagnosed hypertension. These recommendations were particularly relevant to studies reporting substantial levels of undiagnosed or newly detected hypertension and to investigations involving children, adolescents, and populations receiving care through other health services [6, 10, 12, 13, 15, 17–26].

Awareness and health education constituted the second most frequently identified domain, with 14 studies (56%) recommending actions in this area. Proposed approaches included community education, patient counselling, addressing misconceptions about hypertension, and promoting healthier behaviours. These recommendations reflected findings related to inadequate knowledge, limited understanding of hypertension as a chronic condition, and behavioural risk factors identified across several study populations [6, 13, 16–18, 21–24, 27–31].

Recommendations addressing lifestyle and cardiovascular risk-factor prevention were identified in 11 studies (44%). These included promotion of healthier dietary practices and physical activity, prevention or reduction of obesity, and reduction of potentially harmful exposures such as alcohol consumption and excessive intake of sugary foods or drinks. The prominence of this domain indicates that researchers frequently linked hypertension prevention with broader modification of behavioural and metabolic risk factors rather than focusing exclusively on clinical treatment [6, 13, 15–18, 21, 25, 26, 29, 32].

Integration of hypertension care into existing health services was recommended by 9 studies (36%). Recommendations included incorporating hypertension screening and management into HIV care, reproductive health services, and other established chronic-care platforms. This approach was particularly evident in studies involving populations already engaged with health services for other chronic conditions, suggesting opportunities to use existing service-delivery platforms to identify and manage hypertension [15, 17–19, 25–27, 30, 33].

Treatment adherence and continuity of care and community- and population-specific interventions were each identified by 8 studies (32%). Recommendations in the former domain included adherence support, improved follow-up, linkage to care, and strengthening continuity of chronic disease management. The latter included interventions adapted to particular populations or settings, including schools, religious networks, pastoralist communities, and other culturally appropriate approaches [6, 10, 12, 19, 24, 28, 34, 35].

Recommendations concerning medicine availability and affordability and health-worker capacity were each identified in 6 studies (24%). The former included preventing medicine stock-outs, improving access to antihypertensive medicines, reducing treatment-related costs, and strengthening financial protection through insurance or fee-waiver mechanisms. Recommendations relating to health-worker capacity included professional training, task-shifting, improved provider communication, and strengthening clinical capacity for hypertension management[20, 23, 24, 27, 34, 36].

Primary healthcare strengthening was identified in 5 studies (20%). Recommendations in this domain focused on strengthening primary healthcare services and improving facility readiness through better equipment, laboratory capacity, and service-delivery capacity [10, 20, 23, 24, 34].

The least frequently identified domain was health information and monitoring, which appeared in 3 studies (12%). Recommendations included strengthening health management information systems, improving use of routine health data, strengthening adherence to clinical guidelines, and improving monitoring of hypertension-related services [10, 16, 34].

Overall, the recommendations demonstrate that the research literature addressed hypertension through a multilevel set of proposed actions, with greatest emphasis on screening and early detection, health education, lifestyle-related risk reduction, and integration of hypertension services. At the same time, fewer studies explicitly addressed health-system information, monitoring, and primary-care infrastructure. The next stage of the analysis therefore examined whether these research-generated recommendations were reflected in Tanzania's national policy and strategic priorities and whether documented evidence existed beyond policy recognition toward implementation.

Table 2. Major action domains identified from recommendations of hypertension studies included in the analysis, Tanzania, 2016–2026

3.4 Alignment of Research Recommendations with the National NCD Strategic Plan

The recommendations identified from the 25 included hypertension studies showed substantial alignment with the National Strategic Plan for Prevention and Control of Non-Communicable Diseases 2021–2026 (NCD SP3). The strategy explicitly recognizes cardiovascular diseases as a priority area and adopts a primary healthcare, life-course, integrated, multisectoral, evidence-based, and people-centered approach to NCD prevention and control. It also identifies evidence-based planning as a guiding principle, indicating that scientific evidence is expected to inform NCD strategies and interventions [14].

Table 3. Alignment between recommendations from Tanzanian hypertension research and priorities of the National NCD Strategic Plan 2021–2026

3.4.1 Screening, prevention and health promotion

Research recommendations on screening and early detection (15/25, 60%), health education (14/25, 56%), and lifestyle/risk-factor prevention (11/25, 44%) showed strong correspondence with NCD SP3. The strategy prioritizes community-level NCD prevention, early identification and referral, health education, and interventions addressing unhealthy diet, physical inactivity, tobacco and alcohol use. It also identifies schools, community health workers, religious leaders and other community structures as platforms for NCD promotion and screening [14].

3.4.2 Integrated and primary healthcare

Integration of hypertension care (9/25, 36%) and primary healthcare strengthening (5/25, 20%) were also strongly reflected in the strategy. NCD SP3 calls for integrated chronic-care services at primary healthcare level, strengthening of NCD capacity across levels of care, and integration of NCD services into existing programs, including HIV and other services [14].

3.4.3 Medicines, workforce and continuity of care

Research recommendations concerning medicine availability and affordability (6/25, 24%), health-worker capacity (6/25, 24%), and treatment adherence and continuity of care (8/25, 32%) were consistent with the strategy's health-system priorities. NCD SP3 calls for trained health workers, essential medicines and supplies, adequate equipment, strengthened referral systems, and integrated chronic-care services [14].

3.4.4 Community- and population-specific approaches

Community- and population-specific interventions (8/25, 32%) were also consistent with the strategy's emphasis on community participation and people-centered care. NCD SP3 identifies community structures and multiple stakeholders as important actors in NCD prevention and control, consistent with research recommendations involving schools, religious networks and specific population groups [14, 31].

3.4.5 Hypertension-specific targets

The strategy contains explicit targets relevant to the research findings, including a 25% relative reduction in raised blood pressure, 50% coverage of eligible people receiving cardiovascular preventive drug therapy and counselling, and 80% availability of affordable essential NCD medicines and technologies. These targets correspond directly to several recurring concerns identified in the included studies, particularly hypertension burden, inadequate treatment, and medicine availability.

3.4.6 Research, information and monitoring

Although health information and monitoring were recommended by only 3/25 studies (12%), it was explicitly prioritized within NCD SP3. The strategy calls for strengthening NCD information systems, disease-specific registries, DHIS2, monitoring and evaluation, and the use of research findings. It also specifically proposes an annual NCD scientific conference to promote NCD research and utilization of research findings.

3.4.7 Overall alignment

Overall, the comparison demonstrated substantial correspondence between the recommendations generated by hypertension research and the priorities of NCD SP3 across all ten action domains. The strongest overlap concerned screening, health education, risk-factor prevention, integrated care, medicines, workforce capacity, and primary healthcare.

However, this finding represents policy alignment rather than demonstrated research uptake or implementation. NCD SP3 itself acknowledges important gaps in NCD service availability, essential medicines, equipment, trained health workers, and primary-level service capacity. Therefore, the presence of a recommendation in both research and national policy does not establish that the research directly informed policy, nor that the corresponding policy commitment was implemented.

3.5 Evidence of Policy Uptake and Implementation

3.5.1 Translation of research priorities into national policy

The national policy framework demonstrated substantial uptake of the major action areas identified in the 25 hypertension studies. NCD SP3 incorporated priorities related to prevention, screening, health-system strengthening, service integration, workforce capacity, medicine availability, community engagement, surveillance, and research utilization. The strategy also established mechanisms for NCD coordination, resource mobilization, supportive supervision, community engagement, and implementation through government planning structures.

3.5.2 Evidence of implementation

Evidence from the HSSP V Mid-Term Review (MTR) indicates that some of these policy commitments progressed beyond planning into implementation. NCDs, including hypertension, were incorporated into the national HMIS, routine NCD data were being reported from primary healthcare facilities, and annual NCD analytical reports were produced for 2021/22, 2022/23 and 2023/24. GoTHOMIS was also made interoperable with HMIS, with an NCD dashboard allowing monitoring by disease, council and health facility [11].

Implementation research also provided evidence of translation into service delivery. The PenPlus project, implemented in Kondoa and Karatu, strengthened primary healthcare capacity to provide diabetes and hypertension services and was reported to improve service delivery, community awareness, and healthcare-worker competence [11].

3.5.3 Persistent gaps between policy and implementation

Despite these advances, implementation remained incomplete. The MTR reported that NCD service availability remained below 50%, with continuing challenges related to human resources, supply chains, clinical and laboratory equipment, and financing. It recommended further capacity strengthening, increased investment in preventive interventions, and implementation research to identify service-delivery gaps and bottlenecks [11].

Most importantly for the present study, the MTR explicitly reported that utilization of NCD research findings and recommendations to improve service delivery and interventions had been low, despite ongoing research activities and presentation of findings at NCD scientific conferences [11].

3.5.4 Hypertension-specific evidence of the remaining gap

The implementation gap is particularly evident for hypertension. Despite ongoing national NCD interventions, hypertension remained the leading cause of NCD morbidity in primary healthcare data. During 2021–2023, the proportion of NCD patients registered at PHC facilities who had hypertension was 40.6%, 48.9%, and 37.2%, respectively. The MTR consequently recommended strengthening prevention, early detection and treatment strategies and called for implementation research to identify the factors responsible for the continuing burden [11].

The MTR further concluded that the growing burden of hypertension required renewed attention and specifically recommended implementation research to identify gaps and drivers responsible for the high burden and determine appropriate strategies.

3.5.5 Overall assessment

Taken together, the evidence indicates a mixed translation pathway. Tanzania has demonstrated substantial policy alignment, established implementation mechanisms, and documented examples of research-informed or implementation-oriented activities. However, persistent

service-delivery gaps and the government's own mid-term assessment that utilization of NCD research findings remains low indicate that translation from research evidence to routine implementation is incomplete.

3.6 Evidence-to-Action Gaps

The combined analysis identified three principal gaps in the hypertension evidence-to-action pathway.

3.6.1 Research-to-policy gap

The comparison of the 25 studies with NCD SP3 demonstrated substantial thematic alignment between research recommendations and national policy priorities. However, the available evidence does not establish that specific recommendations were directly transferred from individual hypertension studies into the national strategy. Therefore, the principal gap at this stage is not necessarily absence of policy recognition, but limited traceability of the pathway from individual research findings to specific policy decisions.

3.6.2 Policy-to-implementation gap

A clearer gap was observed between policy commitments and routine implementation. Although NCD SP3 established targets, implementation structures, monitoring mechanisms and strategic interventions, the HSSP V MTR documented continuing limitations in NCD service availability, workforce capacity, medicines, equipment, financing and preventive interventions [11, 14].

3.6.3 Implementation-to-outcome gap

The available evidence also suggests a gap between implementation activities and measurable population-level improvement. Despite improvements in HMIS, service monitoring and selected implementation initiatives, hypertension remained the leading cause of NCD morbidity in PHC data and the MTR described the national hypertension burden as continuing to grow [11, 14].

3.6.4 Overall evidence-to-action gap

Overall, the findings do not support the simple conclusion that hypertension research in Tanzania is disconnected from policy. Rather, they demonstrate a more complex pathway:

Research generation → recommendations → substantial policy alignment → selected implementation → persistent implementation and outcome gaps.

The most important unresolved issue is therefore not whether Tanzania produces actionable hypertension research, but how consistently research findings are selected, translated, implemented, monitored and converted into measurable improvements in hypertension prevention and control.

This interpretation is also consistent with the national MTR, which explicitly identifies low utilization of NCD research findings, limited implementation research, and the need for research that is more responsive to health-system and public-health needs [11].

4. Discussion

4.1 Principal findings

This study examined whether hypertension research conducted in Tanzania has progressed beyond the generation of evidence toward policy and practice. Across 25 studies published between 2016 and 2026, researchers identified recurring and actionable priorities, particularly screening and early detection, health education, lifestyle-risk reduction, service integration, continuity of care, medicine access, and health-system strengthening. These recommendations showed substantial correspondence with the priorities and targets of the National NCD Strategic Plan 2021–2026. However, the evidence became less consistent when the analysis moved from policy alignment to implementation and measurable outcomes.

4.2 Beyond publication: the central challenge is translation

The findings challenge the assumption that the main problem is a lack of relevant health research. Tanzania has generated considerable hypertension evidence, and much of this evidence produces recommendations that are already compatible with national priorities. The more important challenge appears to be how evidence is selected, synthesized, translated, implemented, monitored, and sustained. This interpretation is supported by the HSSP V Mid-Term Review, which reported low utilization of NCD research findings and recommendations for improving service delivery despite ongoing research activities [11].

This distinction matters because publication alone should not be considered the endpoint of research. A study identifying poor hypertension control and recommending improved screening, medicine availability or continuity of care creates potential value, but that value depends on

whether the recommendation reaches decision-makers, is incorporated into feasible interventions, receives adequate resources, and is subsequently monitored.

4.3 Policy alignment does not guarantee health impact

A notable finding was the strong alignment between research recommendations and national policy. This suggests that the research-policy interface is not necessarily characterized by complete disconnection. Rather, Tanzania has established a policy environment capable of accommodating many of the actions repeatedly identified by researchers.

However, policy alignment should not be interpreted as evidence of successful translation. The HSSP V Mid-Term Review documented continuing limitations in NCD service availability, human resources, medicines, equipment, financing, and preventive interventions [11]. Thus, the critical gap may occur after policy formulation, when broad strategic commitments must be converted into routine services at scale.

4.4 The missing bridge: implementation research

The findings point toward a need to shift part of Tanzania's research agenda from describing the burden of hypertension toward understanding what works, for whom, under which conditions, and at what scale. The HSSP V Mid-Term Review similarly calls for implementation research to identify the factors responsible for the continuing hypertension burden and determine appropriate strategies.

This is particularly important because the included literature was dominated by prevalence, determinants, barriers, and clinical or population-level descriptions. Such evidence remains essential, but repeated documentation of the same problems without corresponding evaluation of implementation strategies risks producing a cycle of “measure, recommend, publish, and measure again.”

4.5 Toward a more purposeful research ecosystem

Future hypertension research in Tanzania could therefore place greater emphasis on evidence-to-action pathways. Researchers should increasingly engage policymakers and implementers when defining research questions, develop recommendations that specify responsible actors and feasible delivery mechanisms, and evaluate implementation alongside clinical or epidemiological outcomes. Research dissemination should also move beyond journal publication toward policy briefs, decision-maker engagement, feedback to implementing institutions, and accessible communication for communities.

At the system level, routine health information platforms provide an opportunity to connect research with ongoing monitoring. Tanzania has already incorporated NCD indicators, including hypertension, into HMIS and developed mechanisms for routine reporting and analysis. Linking research questions and implementation evaluations to these systems could make it easier to determine not only whether an intervention was implemented, but whether it changed coverage, treatment, control, and ultimately population health.

4.6 Implications for the future

The central implication is that Tanzania may not need simply more hypertension research, but a more deliberate system for converting existing and future evidence into action. The next generation of studies should increasingly ask not only “What is the burden?” or “What are the risk factors?”, but also:

What intervention works in the Tanzanian context, how can it be delivered through the existing health system, who needs to implement it, what resources are required, and what measurable change follows?

Such a shift would move hypertension research from a predominantly problem-documentation model toward an evidence-to-action model, in which publication becomes one step in a longer pathway toward measurable improvements in prevention, detection, treatment, and control.

4.7 Strengths and Limitations

This study provides a structured assessment of the pathway from Tanzanian hypertension research to national policy and implementation, using a 10-year evidence base and comparison with the National NCD Strategic Plan 2021–2026. However, the analysis may not capture unpublished research, internal programs evaluations, or evidence communicated directly to policymakers. Policy alignment was not interpreted as proof that a specific policy decision originated from an individual study, and the available implementation evidence was heterogeneous, limiting attribution of specific health-system changes or outcomes to particular research findings. Finally, the analysis focused on hypertension and therefore may not be directly generalizable to other NCDs.

5. Conclusion

This study demonstrates that Tanzania has generated substantial hypertension research with recommendations that show considerable alignment with national NCD priorities. However, the pathway from research evidence to policy, implementation, and measurable health impact remains incomplete. While national strategies provide implementation structures and some evidence of translation into practice exists,

persistent gaps in service availability, health-system capacity and utilization of research findings remain. The challenge therefore appears to extend beyond generating more evidence toward establishing stronger mechanisms for research synthesis, policy uptake, implementation, monitoring, and evaluation. Future hypertension research in Tanzania should increasingly move from documenting the burden of disease toward evaluating what works, how it can be implemented at scale, and whether it produces measurable improvements in hypertension prevention and control.

Abbreviations

ABPM
ambulatory blood pressure monitoring
AOBP
automated office blood pressure
BMI
body mass index
BP
blood pressure
CCB
calcium channel blocker
CHF
Community Health Fund
CTC
care and treatment clinic
CVD
cardiovascular disease
ED
emergency department
ECG
electrocardiogram
FGD
focus group discussion
GoTHOMIS
Government of Tanzania Hospital Management Information System
HCW
healthcare worker
HIV
human immunodeficiency virus
HMIS
Health Management Information System
HR
hazard ratio
HTN
hypertension
JKCI
Jakaya Kikwete Cardiac Institute
KCMC
Kilimanjaro Christian Medical Centre
MNH
Muhimbili National Hospital
NCD
non-communicable disease
NCD SP3
National Strategic Plan for Prevention and Control of Non-Communicable Diseases 2021–2026
NHIF
National Health Insurance Fund
OPD

outpatient department
PHC
primary health care
PRR
prevalence rate ratio
SARA
Service Availability and Readiness Assessment
SCA
sickle cell anemia
TDHS-MIS
Tanzania Demographic and Health Survey and Malaria Indicator Survey
WHO
World Health Organization.

Declarations

Author contributions

Both authors contribute the effectiveness of the work.

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Data availability

All data are available in the manuscript.

Ethical considerations and Consent to participate

Not applicable.

Competing interests

The authors declare no competing interests.

Consent to publish

Not applicable.

Clinical trial number

Not applicable.

References

1. Mills KT, Stefanescu A, He J. The global epidemiology of hypertension. *Nat Rev Nephrol* 2020; 16: 223–237.
2. Niu C, Zhang P, Wei L, et al. The global burden of hypertension and its epidemiological impacts on adolescents and young adults: projections to 2050. *Front Cardiovasc Med* 2025; 12: 1619445.
3. Kario K, Okura A, Hoshide S, et al. The WHO Global report 2023 on hypertension warning the emerging hypertension burden in globe and its treatment strategy. *Hypertens Res* 2024; 47: 1099–1102.
4. Soliman N, Soliman AT. Global strategies for hypertension prevention: evidence from lifestyle and policy interventions (2010–2025). *Discov Public Health* 2026; 23: 50.
5. Farrar J, Frieden T. WHO global report on hypertension 2025. *The Lancet* 2025; 406: 2318–2319.
6. Pallangyo P. Hypertension in Urban Tanzania: A ticking time bomb.
7. Schutte AE, Venkateshmurthy NS, Mohan S, et al. Hypertension in Low- and Middle-Income Countries. *Circ Res* 2021; 128: 808–826.
8. Kudymowa J, Leow A, Schoubroeck. *Hypertension in low- and middle-income countries Burden, interventions, and potential for philanthropic funding*. Rethink Priorities, https://rethinkpriorities.org/research-area/hypertension-in-low-and-middle-income-countries (December 2024).

9. Mayige M, Kagaruki G, U O, et al. Hypertension Burden and its determinants among adults aged 18 to 69 years in Tanzania: Results from the 2023 National STEPS survey. *Tanzania J Hlth Res* 2026; 27: 1–14.
10. Hertz JT, Sakita FM, Manavalan P, et al. The Burden of Hypertension and Diabetes in an Emergency Department in Northern Tanzania. *Ethn Dis* 2019; 29: 559–566.
11. Mtenga S. *Infectious and Non-Communicable Diseases Control Report*. Dar es Salaam – Tanzania: Ifakara Health Institute, https://ihi.or.tz/media/List_and_report/MTR_Infectious_and_NCDs_Control_-_REPORT.pdf (March 2025).
12. Muhamedhussein MS, Nagri ZI, Manji KP. Prevalence, Risk Factors, Awareness, and Treatment and Control of Hypertension in Mafia Island, Tanzania. *International Journal of Hypertension* 2016; 2016: 1281384.
13. Zack RM, Irema K, Kazonda P, et al. Determinants of high blood pressure and barriers to diagnosis and treatment in Dar es Salaam, Tanzania. *Journal of Hypertension* 2016; 34: 2353–2364.
14. MoH. NATIONAL STRATEGIC PLAN FOR PREVENTION AND CONTROL OF NON-COMMUNICABLE DISEASES 2021-2026, https://tzdpg.or.tz/wp-content/uploads/2022/04/NCD-ACTION-PLAN-2021-2026.pdf (2019).
15. Hertz JT, Prattipati S, Kweka GL, et al. Prevalence and predictors of uncontrolled hypertension, diabetes, and obesity among adults with HIV in northern Tanzania. *Global Public Health* 2022; 17: 3747–3759.
16. Pallangyo P, Komba M, Mkojera ZS, et al. Medication Adherence and Blood Pressure Control Among Hypertensive Outpatients Attending a Tertiary Cardiovascular Hospital in Tanzania: A Cross-Sectional Study. *IBPC* 2022; Volume 15: 97–112.
17. Nsanya MK, Ayieko P, Hashim R, et al. Sustained high blood pressure and 24-h ambulatory blood pressure monitoring in Tanzanian adolescents. *Sci Rep* 2021; 11: 8397.
18. Muhihi AJ, Njelekela MA, Mpembeni RNM, et al. Elevated blood pressure among primary school children in Dar es salaam, Tanzania: prevalence and risk factors. *BMC Pediatr* 2018; 18: 54.
19. Bintabara D, Kamata CC, Sindato E, et al. Hidden crisis of undiagnosed hypertension among women of reproductive age with elevated blood pressure: a regional disparities and determinants using Tanzania nation survey. *BMC Cardiovasc Disord* 2026; 26: 102.
20. Tani K, Osetinsky B, Mhalu G, et al. Seeking and receiving hypertension and diabetes mellitus care in Tanzania. *PLoS ONE* 2024; 19: e0312258.
21. Sungwa EE, Kibona SE, Dika HI, et al. Prevalence and factors that are associated with elevated blood pressure among primary school children in Mwanza Region. *Pan Afr Med J*; 37. Epub ahead of print 2020. DOI: 10.11604/pamj.2020.37.283.21119.
22. Musilanga N, Nasib H, Mwakibolwa A, et al. Burden and determinants of self-reported high blood pressure among women of reproductive age in Tanzania: Evidence from 2022 Tanzania demographic and health survey. *PLoS ONE* 2025; 20: e0314901.
23. Galson SW, Pesambili M, Vissoci JRN, et al. Hypertension in an Emergency Department Population in Moshi, Tanzania; A Qualitative Study of Barriers to Hypertension Control. *PLoS ONE* 2023; 18: e0279377.
24. Galson SW, Stanifer JW, Hertz JT, et al. The burden of hypertension in the emergency department and linkage to care: A prospective cohort study in Tanzania. *PLoS ONE* 2019; 14: e0211287.
25. Lutambi AM, Mnyagatwa PM, Busunge AJ, et al. Prevalence and determinants of hypertension among adults of reproductive age in Tanzania: analysis of a cross-sectional Demographic and Health Survey. *BMJ Open* 2025; 15: e094387.
26. Makubi A, Mmbando BP, Novelli EM, et al. Rates and risk factors of hypertension in adolescents and adults with sickle cell anaemia in Tanzania: 10 years' experience. *Br J Haematol* 2016; 177: 930–937.
27. Manavalan P, Wanda L, Galson SW, et al. Hypertension Care for People With HIV in Tanzania: Provider Perspectives and Opportunities for Improvement. *J Int Assoc Provid AIDS Care* 2021; 20: 23259582211052399.
28. Reis KG, Wilson R, Kalokola F, et al. Hypertensive Urgency in Tanzanian Adults: A 1-Year Prospective Study. *American Journal of Hypertension* 2020; 33: 1087–1091.
29. Khamis AG, Senkoro M, Mwanri AW, et al. Prevalence and determinants of hypertension among pastoralists in Monduli District, Arusha region in Tanzania: a cross-sectional study. *Arch Public Health* 2020; 78: 99.
30. Ottaru TA, Wood CV, Butt Z, et al. "I only seek treatment when I am ill": experiences of hypertension and diabetes care among adults living with HIV in urban Tanzania. *BMC Health Serv Res* 2024; 24: 186.
31. Lambert VJ, Kisigo GA, Nzali A, et al. Religious Leaders as Trusted Messengers in Combatting Hypertension in Rural Tanzanian Communities. *American Journal of Hypertension* 2021; 34: 1042–1048.
32. Mhagama D, Kilonzi M, Kunambi P, et al. Pharmacological management of hypertension and outcome among patients on hemodialysis at Muhimbili National Hospital, Tanzania: a cross-sectional study. *Pan Afr Med J*; 46. Epub ahead of print 2023. DOI: 10.11604/pamj.2023.46.67.39778.
33. Sakita FM, Prattipati S, Chick J, et al. Six-month blood pressure and glucose control among HIV-infected adults with elevated blood pressure and hyperglycemia in northern Tanzania: A prospective observational study. *PLoS ONE* 2023; 18: e0285472.

34. Adinan J, Manongi R, Temu GA, et al. Preparedness of health facilities in managing hypertension & diabetes mellitus in Kilimanjaro, Tanzania: a cross sectional study. *BMC Health Serv Res* 2019; 19: 537.
35. Pallangyo P, Komba M, Mkojera ZS, et al. Medication Adherence and Blood Pressure Control Among Hypertensive Outpatients Attending a Tertiary Cardiovascular Hospital in Tanzania: A Cross-Sectional Study. *IBPC* 2022; Volume 15: 97–112.
36. Zack RM, Irema K, Kazonda P, et al. Determinants of high blood pressure and barriers to diagnosis and treatment in Dar es Salaam, Tanzania. *Journal of Hypertension* 2016; 34: 2353–2364.

Tables

Table 1. Characteristics, key findings, and recommendations of hypertension studies included in the evidence-to-action analysis, Tanzania, 2016–2026

Study	Location and Region	Population and Sample size	Design	Main focus	Key finding	Recommendation
Nsanya et al. 2021[5]	Lake zone, Mwanza	Secondary school adolescents (11–15 yrs). N=500	Cross-sectional	Prevalence and screening strategy	Sustained high BP prevalence 10.2%; confirmed by ABPM 2.6%; risk factors: smoking, high sugar intake, high pulse	Use multiple AOBP measurements + 24-h ABPM; feasible to screen in schools; integrate CVD education
Muhihi et al. 2018[6]	Coastal, Dar es Salaam	Primary school children (6–17 yrs) N=446	Cross-sectional	Prevalence and risk factors	Elevated BP prevalence 15.2% (10.8% hypertension); associated with older age and overweight/obesity	Incorporate BP and BMI assessment into school health programs
Sakita et al. 2023[7]	Northern Zone, Moshi (Kilimanjaro)	HIV-infected adults ≥18 yrs N=500 (163 analyzed)	Prospective observational	Outcomes of elevated BP in HIV care	66% had persistent elevated BP at 6 months; very low medication uptake (4.6%); ECG evidence of ischemia in ~10%	Strengthen NCD care pathways within HIV clinics; integrate hypertension management
Zack et al. 2016[8]	Coastal, Dar es Salaam (Ukonga ward)	Adults ≥40 yrs N=2,174	Community cohort	Determinants and barriers	Hypertension prevalence 37%; major risk factors: obesity, inactivity, alcohol; only 22% treated, 10% controlled	Expand insurance coverage, community-based screening, improve provider training, patient education
Pallangyo et al. 2022[9]	Coastal, Dar es Salaam	Hypertensive outpatients N=849	Cross-sectional	Medication adherence and BP control	76.9% had good adherence, but only 43.2% controlled BP; barriers: cost, drug unavailability, stopping meds when asymptomatic	Address barriers to adherence; ensure drug availability; emphasize lifestyle modification
Bintabara et al. 2026[10]	National (TDHS-MIS 2022). All zones	Women of reproductive age (15–49 yrs) with elevated BP. N=853	Cross-sectional (survey analysis)	Undiagnosed HTN prevalence and determinants	77% undiagnosed; highest in Tabora (97%), Dodoma (90.5%); lowest in Zanzibar (48%); protective factors: age, marriage, internet use, wealth	integrate BP screening into reproductive health services; address regional inequities; leverage digital health literacy
Tani et al. 2024[11]	Morogoro and Kilimanjaro	Adults with HTN/diabetes. N=784	Household and facility surveys	Care-seeking and access	40% diagnosed with HTN; 69% sought care in past 6 months; major barrier: drug stock-outs; NHIF improved access, CHF less effective	Strengthen primary care; improve drug supply chains; expand insurance and fee waivers
Sungwa et al. 2020[12]	Lake zone, Mwanza	Primary school children (6–16 yrs). N=742	Cross-sectional	Prevalence and risk factors	Elevated BP prevalence 18.1% (HTN 8.5%); risk factors: age ≥10, female sex, overweight/obesity, fried food, sugary drinks, pocket money, private schools	Routine BP screening in children; use population-specific cut-offs; promote healthy diet & physical activity; limit pocket money
Hertz et al. 2019[13]	Northern zone, Moshi	Adult ED patients. N=3,961	Retrospective hospital review	Burden in ED admissions	34.3% HTN prevalence; 14.5% uncontrolled; 28.7% of admissions due to HTN/diabetes complications (HF, stroke, hyperglycemia)	ED-based screening & linkage-to-care; strengthen outpatient NCD management to reduce admissions
Musilanga et al. 2025[14]	All zones, National	Women of reproductive	Cross-sectional (survey analysis)	Self-reported HTN burden	6.6% self-reported HTN; higher odds	Increase awareness & proactive

	(TDHS 2022)	age (15–49 yrs). N=15,254			with age, secondary education, marriage/widowhood, wealthier households, poor health status	screening; target high-risk groups (older, wealthier, multiparous women)
Manavalan et al. 2021[15]	Moshi (KCMC + PHCs)	Providers (nurses, COs, MDs) caring for HIV+ patients. N=15	Qualitative	Provider perspectives on HTN care in HIV clinics	Barriers: stigma, depression, poor patient knowledge, insufficient provider training, inefficient prescribing, lack of integration, high costs, limited equipment.	Integrate HTN into HIV platforms; task-shifting; improve training, funding, telehealth.
Galson et al. 2023[16]	Moshi (KCMC ED)	Hypertensive ED patients + ED physicians. N=27	Qualitative	Barriers to HTN control in ED	Themes: poor disease chronicity understanding, weak provider communication, fear/fatalism, lack of family support, structural barriers (cost, transport, wait times).	ED-based interventions: patient education, family engagement, improved provider communication.
Reis et al. 2020[17]	Mwanza (Bugando MC OPD)	Outpatients with hypertensive urgency. N=7,600 screened; 150 enrolled	Prospective cohort	Prevalence and outcomes of hypertensive urgency	2.2% prevalence; 35% hospitalized/died within 1 year; poor adherence predicted poor outcomes (HR 0.06 for good adherence).	Use simple adherence screening tools; intensive counseling for poor adherers.
Galson et al. 2019[18]	Moshi (KCMC ED)	Adults with elevated BP at triage. N=598 enrolled; 539 completed	Prospective cohort	Burden and linkage to care	32.6% ED prevalence; 37% uncontrolled HTN; 44% follow-up within 1 month; proteinuria in 44%. Fear and poor understanding reduced follow-up.	Strengthen outpatient linkage; address fear and misconceptions; reduce reliance on ED for refills.
Lutambi et al. 2025[19]	National (TDHS-MIS 2022)	Adults 15–49 yrs. N=13,385	Cross-sectional survey	Prevalence and determinants	HTN prevalence 11%; highest in 40–49 yrs (22%), obese (24%); age & BMI strongest determinants; spatial clustering in southern/eastern zones.	Target obesity and ageing workforce; integrate NCD prevention into reproductive health.
Khamis et al. 2020[20]	Monduli (Arusha pastoralist)	Adults ≥18 yrs. N=510	Community survey	Pastoralist prevalence and risk factors	HTN prevalence 25.7%; risk ↑ with male sex, age, obesity, sedentary time, fatty foods; protective: fruit intake, physical activity, higher income.	Tailored interventions for pastoralists: promote fruit, reduce fatty foods, encourage activity.
Adinan et al. 2019[21]	Kilimanjaro (Moshi DC & MC)	Health facilities. N= 43 facilities, 62 HCWs	Facility survey	Preparedness for HTN/DM care	Only 53% facilities had trained staff; <15% had full labs; 41% had all first-line meds; poor guideline adherence; weak data use.	Strengthen primary facilities; train HCWs; ensure equipment, labs, medicines; improve HMIS.
Muhamedhussein et al. 2016[22]	Mafia Island	Adults. N=570	Cross-sectional camp survey	Prevalence, awareness, treatment, control	HTN prevalence 49.5%; awareness 26.6%; treatment 57.6% of aware; control only 20.6%.	Raise awareness; improve screening, treatment access, adherence support.

Pallangyo (JKCI) 2020[23]	Dar es Salaam	Urban adults. N=2,773	Community survey	Urban prevalence, treatment, control	HTN prevalence 59.6%; 57% unaware; 36% on treatment; 17.5% controlled; risk factors: age ≥40, male sex, BMI ≥25.	Aggressive obesity control; scale up detection, treatment, follow-up.
Makubi et al. 2016[24]	Dar es Salaam (MNH)	Adolescents & adults with SCA ≥15 yrs. N=1,013	Retrospective cohort	Prevalence, incidence, risk factors in SCA	8% HTN prevalence; 44% relative HTN; incidence 64/1000 PY; risk factors: age >18, BMI, pulse pressure, hemoglobin, transfusion.	Early screening in SCA; monitor BMI, hemoglobin; integrate HTN prevention in sickle clinics.
Ottaru et al. 2024[25]	Dar es Salaam (6 HIV CTCs)	Adults with HIV + HTN/DM. n=33	Qualitative	Experiences of care	Barriers: poor integration, multiple appointments, high costs, lack of meds, fear of side effects; coping: pharmacies, herbal remedies.	Integrate NCD care into HIV CTCs; improve patient education; reduce costs; ensure meds availability.
Lambert et al. 2021[26]	Mwanza (rural)	Religious leaders (Christian & Muslim). N=31	Qualitative	Leaders' perspectives	Beliefs: stress/demons as cause; prayer as treatment; BUT leaders eager to learn and teach biomedical HTN care; congregants receptive.	Train religious leaders as trusted messengers; leverage faith networks for HTN awareness/control.
Mhagama et al. 2023[27]	Dar es Salaam (MNH dialysis units)	Adults on hemodialysis. N=314	Cross-sectional	HTN management in HD	83% uncontrolled pre-dialysis BP; only 17% controlled; CCBs most prescribed; BBs protective; ≥3 dialysis sessions improved control.	Encourage ≥3 dialysis sessions/week; optimize BB use; rationalize polytherapy; strengthen HD HTN protocols.
Hertz et al. 2022[28]	Moshi (Majengo HIV CTC)	Adults with HIV. N=500	Cross-sectional	Prevalence & predictors	HTN prevalence 35%; 90% uncontrolled; 67% undiagnosed; obesity 20%; diabetes 4%; predictors: age, BMI.	Integrate HTN/DM screening into HIV care; address obesity; improve cascade of care.
Galson et al. 2017[29]	Northern Tanzania (Kilimanjaro Region)	Community adults, n=481	Mixed-methods (cross-sectional survey + FGDs/interviews)	Epidemiology & barriers to care	HTN prevalence 28%; risk ↑ with age >60 (PRR 4.68) & alcohol use (PRR 1.72); traditional medicine uses inversely associated (PRR 0.37); awareness 48%, but 95% uncontrolled; barriers: poor communication, low literacy, long waits, undertrained providers.	Explore culturally sensitive strategies; integrate traditional medicine perspectives; improve provider training, patient education, and system efficiency.

ABPM, ambulatory blood pressure monitoring; AOBP, automated office blood pressure; BMI, body mass index; BP, blood pressure; CCB, calcium channel blocker; CHF, Community Health Fund; CTC, care and treatment clinic; CVD, cardiovascular disease; ED, emergency department; ECG, electrocardiogram; HCW, healthcare worker; HIV, human immunodeficiency virus; HMIS, Health Management Information System; HTN, hypertension; JKCI, Jakaya Kikwete Cardiac Institute; KCMC, Kilimanjaro Christian Medical Centre; MNH, Muhimbili National Hospital; NCD, non-communicable disease; NHIF, National Health Insurance Fund; OPD, outpatient department; PHC, primary health care; PRR, prevalence rate ratio; SCA, sickle cell anemia; TDHS-MIS, Tanzania Demographic and Health Survey and Malaria Indicator Survey;

Table 2. Major action domains identified from recommendations of hypertension studies included in the analysis, Tanzania, 2016–2026

Action domain	Examples of proposed actions	No. of studies	% of studies (n=25)
Screening and early detection	Routine BP screening; targeted screening; school-based screening; early identification	15	60%
Awareness and health education	Community education; patient counselling; addressing misconceptions; lifestyle education	14	56%
Treatment adherence and continuity of care	Adherence support; follow-up; linkage to care; chronic care continuity	8	32%
Medicine availability and affordability	Prevent stock-outs; improve medicine access; reduce treatment costs; insurance/fee waivers	6	24%
Primary healthcare strengthening	Strengthen PHC services; improve equipment, laboratory capacity and service readiness	5	20%
Health-worker capacity	Training; task-shifting; provider communication; clinical capacity building	6	24%
Integration of hypertension care	Integration into HIV, reproductive health and other chronic-care platforms	9	36%
Community- and population-specific interventions	Schools; religious networks; pastoralist communities; culturally appropriate approaches	8	32%
Lifestyle and risk-factor prevention	Obesity prevention; healthier diet; physical activity; reduction of alcohol/sugary foods	11	44%
Health information and monitoring	HMIS strengthening; data use; guideline adherence; monitoring	3	12%

PHC, primary health care; BP, blood pressure; HIV, human immunodeficiency virus

Table 3. Alignment between recommendations from Tanzanian hypertension research and priorities of the National NCD Strategic Plan 2021–2026

Research recommendation domain	Evidence from included studies	Corresponding national strategy priority	Alignment
Screening and early detection	15/25 studies (60%)	Detection and control of hypertension; community-level screening and early identification of NCD cases	High
Awareness and health education	14/25 (56%)	Community NCD education, health promotion, advocacy and social mobilization	High
Lifestyle/risk-factor prevention	11/25 (44%)	Reduction of alcohol, tobacco, unhealthy diet, physical inactivity; school/community prevention	High
Integration of hypertension care	9/25 (36%)	Integrated chronic-care approaches and integration of NCD services into existing platforms	High
Adherence and continuity of care	8/25 (32%)	Continuum of care, treatment and follow-up for people with NCDs	Moderate–High
Community/population-specific interventions	8/25 (32%)	Community health structures; HCWs, religious leaders, schools and other community stakeholders	High
Medicine availability and affordability	6/25 (24%)	80% availability of affordable essential NCD medicines and technologies by 2026	High
Health-worker capacity	6/25 (24%)	Strengthening NCD workforce skills through pre-service and on-job training	High
Primary healthcare strengthening	5/25 (20%)	Reorientation and strengthening of NCD services at primary-care level	High
Health information and monitoring	3/25 (12%)	Strengthening HMIS, M&E, DHIS2 and disease-specific data systems	High

NCD, non-communicable disease; HCW, healthcare worker; HMIS, Health Management Information System; DHIS, District Health Information Software.

Figures

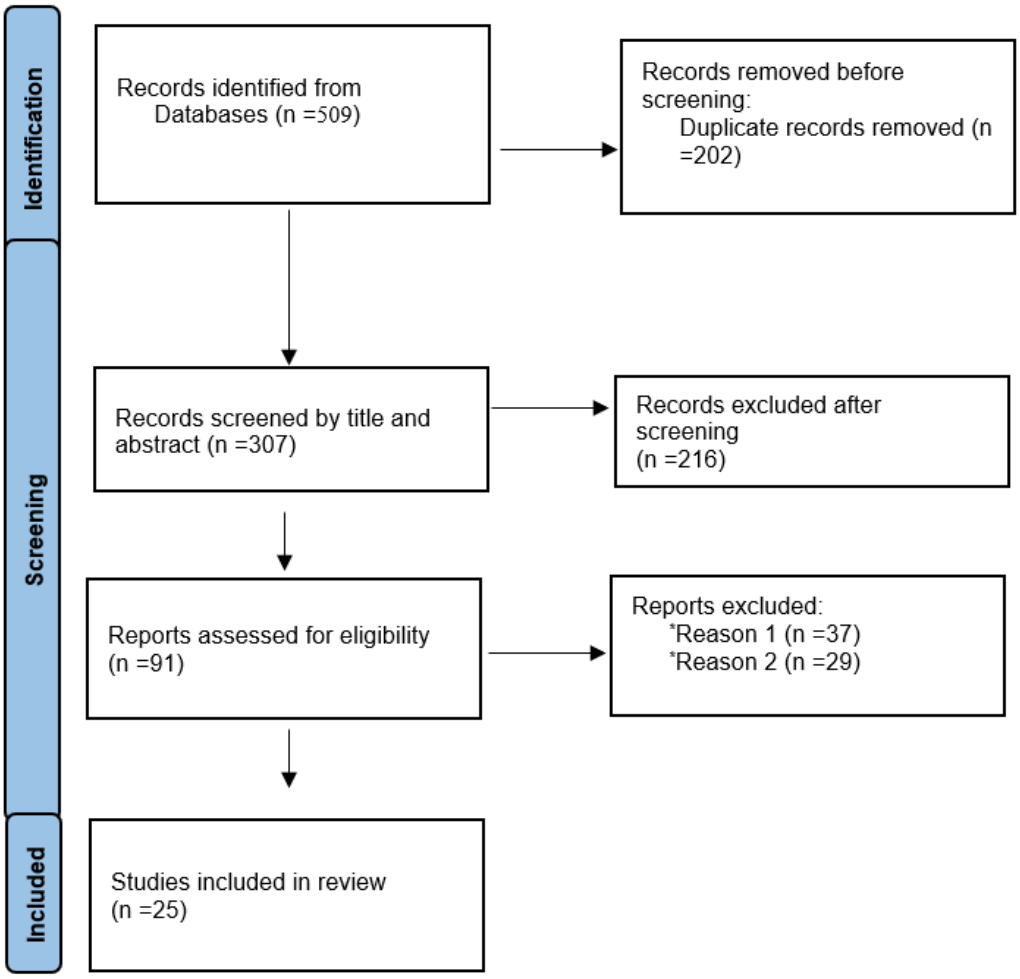


Figure 1

Characteristics, key findings, and recommendations of hypertension studies included in the evidence-to-action analysis, Tanzania, 2016–2026

*__Reason 1:__ Focused exclusively on laboratory or biological mechanisms without implications for health policy or practice

*__Reason 2:__ Lacked Tanzania-specific findings.