Hypertension

REVIEW

Priorities for Research on Hypertension Care Delivery: A WHO Report Executive Summary

Kunihiro Matsushita, Sonia Y. Angell, Lawrence J. Appel, Helen Bygrave, Jennifer Cohn, Robert Kalyesubula, Prabhdeep Kaur, Andrew E. Moran, Margaret Mswema, Veronica Schoj, Aletta E. Schutte, Ruitai Shao, Xin-Hua Zhang, Pedro Ordunez, Taskeen Khan

ABSTRACT: In 2024, the World Health Organization released a report on Priorities for Research on Hypertension Care Delivery; this article provides its executive summary. The World Health Organization and its technical experts formed a leadership team, developed a scope and objectives, created a thematic framework, developed a survey for each theme, and identified research priorities. The 5 themes included (1) Health care workforce for hypertension care delivery, (2) Service delivery system/models, (3) Patient retention/adherence, (4) Financing the care delivery system, and (5) Research gaps identified in the World Health Organization 2021 Hypertension Guideline. The leadership team received feedback from diverse experts through webinars and online surveys. The final report was peer-reviewed by external experts. According to postwebinar surveys, we identified 5 to 7 research priorities within each theme, totaling 29 research priorities. The 10 highest priorities were (1) Cost-effectiveness of combination therapy in low/middle-income countries, (2) A system allowing hypertension care closer to home, (3) Health system reform allowing trained community health workers to refill/initiate/titrate antihypertensive medications, (4) Health system reform allowing nurses to diagnose and treat hypertension, (5) Gaps in the medication supply chain, (6) New approaches integrating the management of hypertension and other diseases, (7) Digital approaches for improving medication adherence, (8) Optimal approaches to train health care workers, (9) Approaches to finance hypertension control programs, and (10) Implementation research on task-sharing approaches. These research priorities provide guidance to researchers, with immediate implications for substantially improve hypertension care and prevent its sequelae. We urge governments, funding agencies, and organizations to consider supporting these research topics.

Key Words: delivery of health care ■ feedback ■ government ■ hypertension ■ research

Hypertension is the leading cause of mortality and affects over 1 billion adults worldwide.[1] Despite our knowledge of hypertension and the availability of affordable and effective medications, the control rate of hypertension is dismally low, at ≈20% globally.[1] To overcome this important health issue, the World Health Organization (WHO) and its partners took several important actions in the last several years. Specifically, WHO launched the Global HEARTS initiative and its technical package in 2017 to improve the management of major cardiovascular disease risk factors, focusing on hypertension control.[2] Resolve to Save Lives has been supporting the implementation of this HEARTS package in many countries.[3,4] In addition, WHO recently released a clinical guideline for hypertension[5] and the first-ever global report on hypertension.[6] However, in these landmark documents, research priorities were not extensively emphasized. Therefore, in collaboration with Johns Hopkins University and Resolve to Save Lives, WHO took the initiative to convene global experts and stakeholders to systematically identify the top research priority areas to promote effective health care delivery to improve global hypertension management. The original report was published online earlier last year,[7]

Correspondence to: Kunihiro Matsushita, Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Division of Cardiology, Johns Hopkins School of Medicine, Welch Center for Prevention, Epidemiology, and Clinical Research, 2024 E. Monument St, Ste 2-600, Baltimore, MD 21287. Email kuni.matsushita@jhu.edu

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REVIEW

Nonstandard Abbreviations and Acronyms

LMICs	low- and middle-income countries
WHO	World Health Organization

but this article provides an executive summary of this development.

METHODS

We adapted a method previously described by Nasser et al[8] to guide this project and took the steps described in Table 1 to ensure the transparency of our methods and to include broad perspectives from experts and stakeholders. The primary objective was to identify key research topics rather than to answer a specific research question. As such, systematic reviews were not conducted to avoid potential biases that could skew the prioritization process toward specific areas or topics.

Organizational Structure

WHO staff (Drs Taskeen Khan, Prebo Barango, Ruitai Shao, and Pedro Ordunez) collaborated with content area experts from Johns Hopkins University (Drs Kunihiro Matsushita and Lawrence Appel) and Resolve to Save Lives (Drs Jennifer Cohn and Andrew Moran). They identified potential members for a leadership team, ensuring a diverse range of backgrounds (eg, geodemographic) and expertise (clinical medicine, pharmacology, research, advocacy, and policymaking; Table S1). The leadership team was tasked with selecting 5 key themes, nominating experts to participate in webinars, reviewing and approving webinar agendas and materials, moderating the webinars; compiling webinar reports, and finalizing the project report. Drs Matsushita and Khan co-led the leadership team.

Five Key Themes

While there are numerous research topics that could enhance hypertension care, the leadership team focused on areas with immediate applicability toward global hypertension management and care. For example, topics such as novel antihypertensive medication or a cuffless blood pressure device were considered beyond the scope of this project. Instead, the team concentrated on aspects of the hypertension care continuum, particularly those with the greatest relevance to care delivery (treatment delivery, patient retention, and achieving control). The 5 key themes identified were (Figure): (1) Health care workforce for care delivery, (2) Service delivery system/models for hypertension, (3) Patient retention/adherence in hypertension care delivery, (4) Finance supporting the care delivery system for hypertension, and (5) Research gaps identified in the WHO 2021 Guideline for the Pharmacological Treatment of Hypertension in Adults.[9]

Table 1. Steps Taken to Identify Top Research Priorities for Hypertension Care Delivery

Steps	Action	Main entity in charge
1	Form a leadership team	WHO and technical experts (the full list in Table S1)
2	Develop scope and objectives	The leadership team
3	Create a thematic framework	The leadership team
4	Develop a survey on each thematic area	The leadership team
5	Identify research priorities	The leadership team and webinar participants
6	Peer review	Seven experts with diverse backgrounds and geographic representation

Webinars

For each key theme, the leadership team held a webinar and invited experts from diverse geodemographic backgrounds with relevant expertise. Before each webinar, participants (both the leadership team members and invited experts) were asked to propose up to 5 high-priority research questions and 5 scientific articles relevant to the theme of the webinar (prewebinar survey). Based on the responses, the leadership team created a postwebinar survey with a set of questions to narrow down potential research questions or topics. The postwebinar survey was administered at the end of the webinar, but webinar participants were able to respond to the survey after the webinar as well.

Identifying Priority Research Areas/Topics

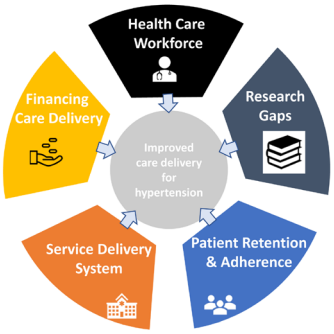
Based on the postwebinar survey results, the leadership team identified several research priorities for each theme and proposed appropriate study designs (eg, randomized controlled trials, implementation research, and simulation studies) for each research priority. Ultimately, the leadership team voted for the top 10 priorities across the aforementioned 5 themes.

External Reviews of the Final Report

To ensure transparency and fairness, WHO regional offices reviewed and commented on the proposed research priorities. In addition, the final report underwent a thorough review by both internal (within WHO) and external experts.

RESULTS

For each of the 5 themes, 5 to 7 research priorities were identified (Table S2). Of the resulting total of 29 priorities, the leadership team selected the top 10 research priorities, as summarized in Table 2. Four of the 10 priorities (priorities 3, 4, 8, and 10) involve health care workers and their task-sharing. A new system allowing hypertension care closer to home (priority 2) likely requires the involvement of health care workers as well. Since frontline clinics and health care workers manage patients with multiple clinical conditions (eg, hypertension and diabetes), there was interest in researching the integration of care for hypertension and other clinical conditions (priority 6). There were 3 research priorities



Top 10 Research Priorities

Ranking	Priority topics
1	Cost-effectiveness of combination therapy
2	A system allowing hypertension care closer to home
3	Trained community health workers to refill, initiate, and titrate antihypertensive medications
4	Nurses to diagnose and treat hypertension
5	Gaps in the medication supply chain
6	Integrating the management of hypertension and other diseases
7	Digital approaches for improving medication
8	Optimal approaches to train healthcare workers
9	Financing hypertension control programs
10	Implementation research on task-sharing approaches

Figure. Five key themes with the goal to improve care delivery for hypertension.

relevant to medications, the cost-effectiveness of combination therapy in low- and middle-income countries (LMICs; priority 1), the identification of medication supply gaps (priority 5), and the effectiveness of digital approaches for improving medication adherence (priority 7). A priority topic featured the cost-effectiveness or cost analysis of different approaches to finance hypertension care (priority 9).

Next Steps

The top 10 research priorities are high-level and do not articulate specific research questions or designs. This is intentional because specific aspects of implementation should be determined by researchers according to a range of considerations, such as local context, specific population needs, health care infrastructure, and available resources. Nonetheless, we have listed some examples of research approaches (eg, randomized controlled trials, quasi-experimental studies, implementation research) in Table 2 as guidance for researchers and summarized key next steps below.

These research priorities will not only guide individual researchers but also serve as a catalyst for funding agencies and advocacy groups to prioritize support for these topics. Funding opportunities are critical for ensuring sustainable research efforts to improve hypertension control. Funding organizations such as governmental health departments, international development agencies, philanthropic foundations, and private-sector stakeholders can play a pivotal role by launching grant initiatives or collaborative programs aimed at addressing these priorities. In this context, partnerships between research institutions and policymakers can be fostered to secure funding and resources while ensuring that the proposed research is relevant and actionable.

Another important issue is the generation of local evidence. Among government officials and policymakers,

Table 2. Top 10 Research Priorities for Improving Hypertension Care

Ranking	Research priority	For example, of research methods
1	Assess the cost-effectiveness of combination therapy in LMICs, especially single-pill combinations, in improving adherence, relative to monotherapy	Simulation/modeling study, RCT
2	Develop and evaluate a system allowing hypertension care closer to home (eg, community clinics, community centers, or even in the patient's own home)	Cluster RCT, quasi-experimental studies, implementation research
3	Determine effectiveness and safety of health system reform that allows trained community health workers (CHWs) to refill or even initiate/titrate antihypertensive medications with the supervision of appropriate professionals (eg, physicians and nurses)	Cluster RCT, quasi-experimental studies
4	Determine effectiveness and safety of health system reform that allows nurses to diagnose hypertension and initiate/titrate antihypertensive medications	Cluster RCT, quasi-experimental studies, implementation research
5	Identification of gaps in the medication supply	Root cause analysis
6	Determine the efficacy/effectiveness of a new approach integrating the management of hypertension and other clinical conditions	Cluster RCT, quasi-experimental studies
7	Evaluate the effectiveness of a digital approach for improving medication adherence and patient retention	RCT, quality improvement project
8	Identify optimal approaches to training and retraining health care workers to support task-sharing of hypertension management	Pre/postevaluation, cluster RCT, qualitative research, implementation research, quality improvement project
9	Assess cost-effectiveness or cost analysis of different approaches to financing hypertension care in a specific region/country	Simulation/modeling study, cluster RCT
10	Conduct implementation research on an approach to task-sharing that addresses barriers in relevant settings	Qualitative study

LMICs indicates low- and middle-income countries; and RCT, randomized controlled trial.

there is a strong desire for such evidence that reflects local realities and nuances. Clearly, it is impractical to generate specific evidence for every research question in each country. To address this challenge, establishing coalitions of countries with similar social environments could be an effective solution. Such coalitions could enable the pooling of resources, expertise, and data, leading to research findings that are applicable across multiple settings. In addition, these collaborations could reduce duplication of research efforts, facilitate the sharing of best practices, and create a broader and more generalizable base of evidence.

To enhance the translation of research into practice, mechanisms such as capacity-building workshops, dissemination networks, and open-access platforms could be developed, informed in part by key stakeholders. These mechanisms would ensure that researchers, clinicians, and policymakers have access to the latest evidence, methodologies, and implementation tools, thereby fostering a culture of evidence-based decision-making. Stakeholder engagement will be essential to integrate patient and community perspectives into the research process and agenda. The involvement of key stakeholders ensures that the research not only addresses clinical and policy concerns but also aligns with the lived experiences and priorities of those most affected by hypertension. By incorporating these diverse viewpoints, the research impact can be maximized.

DISCUSSION

This is the first WHO report on research priorities focusing on hypertension. This report summarizes the top 10 research priorities to improve the health care delivery of hypertension globally and the methodology used by WHO and its partners. Many of the 10 priorities refer to key components of health care system design (eg, health care workforce, their roles and task-sharing, health care financing, and medication supply). This list of research priorities on hypertension care delivery provides guidance on critical research areas for researchers and urges governments, funding agencies, and academic and research organizations to consider research in the high-priority areas.

Health care workers are crucial in delivering hypertension care. However, in most countries globally, only physicians are authorized to deliver hypertension management and prescribe antihypertensive medications. This practice, coupled with the shortage of physicians, often leaves many patients with hypertension untreated.[10] This is especially the case in rural areas with limited access to care, as health care services for hypertension are often centralized. This gap in care delivery likely explains why a significant portion of the top research priorities focuses on task-sharing and expanding the roles of nurses, community health workers, and community clinics/centers in hypertension management.

The successful expansion of community health workers' roles in child and maternal health—such as administering vaccinations and providing first-line antibiotics in LMICs—suggests a promising model for hypertension care. Studying whether an expanded scope of responsibilities for community health workers in hypertension management, such as diagnosing the condition or prescribing antihypertensive medications, is a logical next step. Given the unique challenges of hypertension management, including the need for lifelong care and the often asymptomatic nature of the condition, it is essential to rigorously test the effectiveness, safety, and system-level changes necessary to support the expanded roles of community health workers. In addition, the optimal integration of physician (or nurse, if allowed to prescribe relevant medications) supervision—whether remote or in-person—and determining the appropriate frequency must be carefully tailored to each specific setting, especially the regulatory environment.

Although lifestyle modifications are relevant to all patients with hypertension, antihypertensive medications are required to achieve control in the majority of patients. Shortages of antihypertensive medications in the public health care system have often been reported,[11] and the causes of medication shortages are usually multifactorial, including supply-side problems, demand-side issues, and regulatory barriers, and are likely region/country-specific. Thus, a systematic root cause analysis will be informative to establish sustainable medication supply. Market surveys to improve medication price transparency can be an important tool to empower governments to negotiate for fair and affordable medicine prices and lower hypertension program costs.[12]

Another important medication-related barrier is patient adherence. For example, a US study reported that approximately half of patients who received an antihypertensive medication discontinued it within 1 year.[13] Thus, it is reasonable to prioritize research on digital approaches to improve medication adherence and patient retention.[14] We should also acknowledge the potential of digital approaches for hypertension care beyond adherence (eg, telemedicine, home blood pressure monitoring, and virtual behavior coaching). The interest in single-pill combination pills in LMICs as one of our priorities likely comes from the same motivation to improve medication adherence.[15] The recent European Society of Cardiology guidelines for hypertension management also listed the need for trials assessing single-pill combination pills versus multiple monotherapies as one of their evidence gaps.[16] A key issue to address is the common finding that the cost of single-pill combination pills is considerably higher than the sum of the costs of individual pills of the medications that comprise the combination pill.[17]

Several hypertension programs (eg, the India Hypertension Control Initiative, the Bangladesh Hypertension Control Initiative, and other WHO Global HEARTS

Initiative programs) have been successful in improving hypertension control.[4,18–20] These programs have clearly shown that health care systems in LMICs can be leveraged to manage hypertension.[21] Hypertension is an ideal pathfinder for a few reasons. First of all, hypertension does not require laboratory or imaging exams for its diagnosis and monitoring. Also, there are many effective, affordable, and safe antihypertensive medications. Simultaneously, many patients with hypertension have other comorbidities (eg, diabetes, dyslipidemia, or lung disease), and thus whether and how to integrate multiple clinical conditions is a high research priority. In this regard, a recent cluster randomized controlled trial in Uganda and Tanzania reported that the integrated care of hypertension and diabetes was possible in patients with human immunodeficiency virus infection without affecting the quality of human immunodeficiency virus care.[22] Similar studies are warranted in other clinical settings and regions.

Financing hypertension care is a unique topic within our top 10 priorities. Health financing interventions have been used to motivate providers (eg, pay-for-performance) and patients (eg, vouchers) for better clinical management and treatment adherence.[23] Health insurance coverage is another relevant concept.[24] However, little is known about whether these financial interventions could actually improve the control rate of hypertension, particularly in LMICs. Thus, this is an important and understudied area for future investigation. An important caveat of financial incentives is that their beneficial effects often diminish over time,[25] which can be especially relevant to lifelong clinical conditions like hypertension.

There are a few other limitations to be acknowledged. First, webinar invitees were not systematically identified and mainly based on the network of the leadership team members. However, we should acknowledge that a total of 206 experts (some experts were invited to multiple webinars) from all habitable continents were invited to the 5 webinars, and diversification of webinar participants was a high priority. Second, we held a single webinar for each theme, and thus some experts probably could not attend the webinars or contribute to the postwebinar surveys. Nonetheless, a total of 113 experts joined the 5 webinars. Also, the leadership consisted of 16 members with diverse locations, backgrounds, and expertise to reflect a broad range of perspectives.

In conclusion, WHO and its partners identified the 10 highest research priorities that are crucial for the immediate enhancement of hypertension care delivery on a global scale. These priorities encompass critical research areas such as the roles and task-sharing of health care workers, health care financing, medication supply, and adherence. This list serves as a strategic guide for researchers, highlighting crucial areas of focus in hypertension care, and calls on governments, funding agencies, and academic organizations to consider supporting these vital research initiatives.

PERSPECTIVES

The WHO and its partners identified the 10 highest research priorities that are crucial for the immediate enhancement of hypertension care delivery on a global scale: (1) Cost-effectiveness of combination therapy in low/middle-income countries, (2) A system allowing hypertension care closer to home, (3) Health system reform allowing trained community health workers to refill/initiate/titrate antihypertensive medications, (4) Health system reform allowing nurses to diagnose and treat hypertension, (5) Gaps in the medication supply chain, (6) New approaches integrating the management of hypertension and other diseases, (7) Digital approaches for improving medication adherence, (8) Optimal approaches to train health care workers, (9) Approaches to finance hypertension control programs, and (10) Implementation research on task-sharing approaches. These priorities encompass critical research areas such as the roles and task-sharing of health care workers, health care financing, medication supply, and adherence. This list serves as a strategic guide for researchers, highlighting crucial areas of focus in hypertension care, and calls on governments, funding agencies, and academic organizations to consider supporting these vital research initiatives.

ARTICLE INFORMATION

Affiliations

Johns Hopkins Bloomberg School of Public Health, Baltimore, MD (K.M., S.Y.A., L.J.A.). Médecins Sans Frontières, United Kingdom of Great Britain and Northern Ireland, London, United Kingdom (H.B.). University of Pennsylvania, Philadelphia (J.C.). Makerere University, Kampala, Uganda (R.K.). Indian Institute of Science, Bengaluru, India (P.K.). Resolve to Save Lives and Columbia University, New York, NY (A.E.M.). University Teaching Hospital, Lusaka, Zambia (M.M.). Global Health Advocacy Incubator, Washington, DC (V.S.). University of New South Wales, The George Institute for Global Health, Sydney, Australia (A.E.S.). Peking Union Medical College, Beijing, China (R.S.). Beijing Hypertension League Institute, Beijing, China (X.-H.Z.). Department of Noncommunicable Diseases and Mental Health, Pan American Health Organization, Washington, DC (P.O.). WHO, Geneva, Switzerland (T.K.).

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The leadership team: Taskeen Khan (Department of Noncommunicable Diseases, World Health Organization [WHO]), Prebo Barango (Department of Noncommunicable Diseases, Regional Office for Africa), Pedro Ordunez (Department of Noncommunicable Diseases and Mental Health, Regional Office for the Americas), Kunihiro Matsushita, Sonia Angell, and Lawrence Appel (Johns Hopkins Bloomberg School of Public Health, United States), Helen Bygrave (Médecins Sans Frontières, United Kingdom of Great Britain and Northern Ireland), Jennifer Cohn (University of Pennsylvania, United States), Robert Kalyesubula (Makerere University, Uganda), Prabhdeep Kaur (Indian Institute of Science, India), Andrew Moran (Resolve to Save Lives, United States), Margaret Mswema (University Teaching Hospital, Lusaka, Zambia), Veronica Schoj (Global Health Advocacy Incubator, United States), Aletta E. Schutte (UNSW Sydney, The George Institute for Global Health, Australia), Ruitai Shao (Peking Union Medical College, China), and Xin-Hua Zhang (Beijing Hypertension League Institute, China). External reviewers of the final report: Bader Almustafa (Ministry of Health, Saudi Arabia), Chaisiri Angkurawaranon (Chiang Mai University, Thailand), Renu Garg (Resolve

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