

# Strategies to overcome barriers to hypertension control in a resource-poor setting

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## Introduction

High blood pressure is extraordinarily common. Approximately one-third of the world's adult population suffer from arterial hypertension. High blood pressure is the world's leading cause of mortality with nearly 10.7 million deaths per year worldwide (1). Although treatment for hypertension is safe, effective, and low-cost, only 15% of people with hypertension worldwide achieve target blood pressure levels. (2). The direct medical costs associated with hypertension treatment globally are estimated to be USD 370 billion a year. Health care savings from effective management of blood pressure is projected to be roughly \$100 billion per year (3).

Evidence-based interventions such as dietary salt reduction and antihypertensive medications are well known strategies for prevention and management of hypertension. Implementation of these interventions in low-resource settings is suboptimal (4).

Poor integration of healthcare systems is a major obstacle for optimal blood pressure control (5). Shortage of skilled health professionals, unaffordability and lack of antihypertensive medications are strongly associated with inadequate blood pressure control in most developing countries (6,7). Scarcity of community engagement, low health literacy and poor understanding about the disease are other contributory factors.

Significant barriers to ensure continuity of care in developing countries include fragmented healthcare information systems, inadequate health

financing mechanisms and deficiency of operational support (8).

Novel innovative strategies to overcome these challenges and to optimise hypertension control are desperately needed in lower and middle income countries.

## Screening and diagnosis

Since screening protocols for hypertension are not standardised in many countries, an opportunity to make an early diagnosis is missed causing diagnostic inertia. Inaccurate blood pressure measurement compounds the problem further. Without accurate diagnosis, a patient will not receive appropriate treatment and management.

Efforts to decrease the global burden of cardiovascular disease must include widespread hypertension screening programmes to facilitate early diagnosis and treatment of hypertension. Proper blood pressure measurement, using accurate devices, is essential to avoid over or under diagnosis.

Accessing an accurate blood pressure measuring device is a challenge faced by health professionals in low-resource settings. Mercury sphygmomanometer, when used by trained observers, has long been considered the gold standard for non-invasive blood pressure measurement (9). However, with the phasing out of mercury-column sphygmomanometers in many countries, clinically validated automated digital monitors are required for effective hypertension management. Automated devices require less training for its use but attention to integrity of tubing and cuff is essential to maintain accuracy

over time (10). Quality of hypertension screening and diagnosis in these settings may also be hindered by lack of skilled training and difficulties in obtaining multiple blood pressure measurements when required for clinical diagnosis (11).

Home blood pressure monitoring has a well-established primary role in management of hypertension and current guidelines recommend its wide use in clinical practice. The cost of the device is the biggest barrier for home blood pressure monitoring in most low-resource settings (12).

In busy hospital clinics either rushing through the blood pressure measurements or prescribing medications without measurements aggravate the problem. Even though different cuff sizes are recommended to be used in individuals with different arm circumferences, one standard size is used for all individuals in low-resource settings. Training a range of healthcare workers to measure the blood pressure accurately using automated monitors is suggested to overcome these practical problems.

### Treatment and adherence

Many patients fail to reach blood pressure goals despite the improvements seen in overall management of hypertension. A continuing challenge for these patients is the day-to-day burden of managing their chronic disease, which entails complex medication regimens, lifestyle behavioural changes.

Most guidelines advise to diagnose hypertension and initiate treatment if the systolic blood pressure is more than 160 mmHg and/or the diastolic more than 100 mmHg on several occasions (two or more readings) on a single day, or more than 140/90 mmHg on two different days. Still the borderline values leave room for confusion (13).

When blood pressure readings are in the range of 140-159/90-99 mmHg the recommendation to assess after lifestyle changes for three months

before starting treatment runs the risk of losing the patient for follow-up.

Guidelines developed for high-income countries are not suited for resource-poor settings. Hence, the low-income countries should have their own guidelines. The Ministry of Health in Sri Lanka has taken steps to develop such guidelines with more practical and simpler drug and dose specific protocols to be used in different care levels.

Treatment adherence is the cornerstone of effective management of hypertension. Individuals with high adherence to antihypertensive medications are 45% more likely to achieve blood pressure control than those with medium or low adherence (14). Therefore, efforts to identify and rectify the underlying reasons are vital and rewarding.

Simplification of the medication regimen stands out as one of the most effective ways to improve adherence. Simplifying the dosing, use of pill boxes and reminders for prescriptions are useful to maintain medication regularity. The use of a fixed-dose combination of antihypertensive drugs reduces the pill burden while improving adherence and clinical outcomes. Majority of patients (>60%) with hypertension require two or more drugs to achieve optimal blood pressure control but only less than one-third of those treated receive such therapy (15).

In Sri Lanka, a randomised controlled trial showed that low-dose triple combination of antihypertensive therapy with an angiotensin receptor blocker, calcium channel blocker, and thiazide diuretic led to a significantly increased proportion of patients achieving their target blood pressure compared to usual care at six months (16). This randomised controlled trial provides evidence to support a polypill approach as initial treatment for hypertension, particularly in low-resource settings. When combined, drugs work synergistically, and blood pressure control improves at lower dosages (17). As fixed dose combinations are available, dose changes of individual drugs are not possible. The inclusion of fixed-dose combinations in the WHO essential medicines list, leads to better

availability and affordability of medications.

### Implementation strategies

Several innovative and pragmatic strategies have been tried out in the quest to improve hypertension control with varying success.

Community-based interventions such as measuring blood pressure at home and community centres are a critical pillar in prevention and control of hypertension (5). In addition, these programmes could provide a platform to raise awareness of hypertension and increase community participation in healthcare services. One such programme adopted in South Asian countries including Sri Lanka has demonstrated the feasibility of using community health workers (CHWs) for home-based screening, monitoring, health education and referral (18). Checklists are available to guide, coordinate and triage.

A patient-centred model improves the quality of care provided for individuals with complex diseases such as hypertension. It involves a patient-health provider partnership that is of mutual benefit. It empowers health literacy enabling the patient to make personalised decisions about their health (19).

Patient involvement in decision-making is one of the core principles of management of chronic diseases. During the clinical encounter, the patient's preferred level of involvement should be gauged, and therapeutic choices be explored aiming at better adherence to therapy (20). The pivotal role played by effective communication, consistency, and patient satisfaction should not be underestimated in hypertension management.

Engaging trained nurses, pharmacists and CHWs in a limited role of routine hypertension management under the supervision of primary care physicians, supported by computer-based treatment algorithms is a strategy that needs trialling in the local contexts (21). Non-physician healthcare workers are generally not authorised to prescribe, modify, or refill medications in many

countries. Appropriate training and regulatory approval can be used to address shortfalls in the availability of health professionals.

In several countries including Sri Lanka, a high proportion of patients seek treatment from the private sector. Although the quality of service varies, it is a convenient and popular access point for care for some patients. The necessary training should be provided to stakeholders in the private sector to improve hypertension management.

The reduction in the mean population salt intake to reduce the prevalence of elevated blood pressure is one of the population level strategies of the WHO Global Action Plan for Control of Non-Communicable Diseases. However, implementation of such policies and interventions are challenging. Introducing salt substitution and increasing taxation as a policy appears to be the most effective among these (22, 23).

Emerging evidence suggests that barriers to hypertension control can be overcome at a personal and population level through effective policies and interventions. However, further research is needed to explore how to implement these to adapt to local context and needs.

## References

1. GBD 2016 Risk Factors Collaborators. Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet*. 2017;390:1345-1422.
2. Mills KT, Bundy JD, Kelly TN, et al. Global disparities of hypertension prevalence and control: a systematic analysis of population-based studies from 90 countries. *Circulation*. 2016;134:441-45.
3. Gaziano TA, Bitton A, Anand S, Weinstein MC; International Society of Hypertension. The global cost of nonoptimal blood pressure. *J Hypertens*. 2009;27(7):1472-1477.
4. Chow CK, Teo KK, Rangarajan S, et al. Prevalence, awareness, treatment, and control of hypertension in rural and urban communities in high-, middle-, and low-income countries. *JAMA*. 2013;310(9):959-968.

5. Mercer T, Nulu S, Vedanthan R. Innovative Implementation Strategies for Hypertension Control in Low- and Middle-Income Countries: a Narrative Review. *Curr Hypertens Rep.* 2020;22(5):39. doi: 10.1007/s11906-020-01045-1.
6. Khatib R, McKee M, Shannon H, et al. Availability and affordability of cardiovascular disease medicines and their effect on use in high-income, middle-income, and low-income countries: an analysis of the PURE study data. *Lancet.* 2016;387(10013):61–9.
7. Anyangwe SC, Mtonga C. Inequities in the global health workforce: the greatest impediment to health in sub-Saharan Africa. *Int J Environ Res Public Health.* 2007;4(2):93–100.
8. Frieden, T. R., Varghese, C. V., Kishore, S. P., et al. (2019). Scaling up effective treatment of hypertension-A pathfinder for universal health coverage. *Journal of clinical hypertension (Greenwich, Conn.)*2019;21(10):1442–1449.
9. Grim, C. E., & Grim, C. M. (2016). Auscultatory BP: Still the gold standard. *Journal of the American Society of Hypertension*, 10, 191–193.
10. Brady TM, Padwal R, Blakeman DE, et al. Blood pressure measurement device selection in low-resource settings: Challenges, compromises, and routes to progress. *J Clin Hypertens (Greenwich).* 2020;22(5):792-801.
11. Rakotz MK, Townsend RR, Yang J, et al. Medical students and measuring blood pressure: results from the American Medical Association Blood Pressure Check Challenge. *J Clin Hypertens.* 2017;19(6):614-619
12. Buranakitjaroen P, Wanthong S, Sukonthasarn A. Asian management of hypertension: Current status, home blood pressure, and specific concerns in Thailand. *J Clin Hypertens (Greenwich).* 2020;22(3):515-518. doi:10.1111/jch.13800
13. Williams B, Mancia G, Spiering W, et al. 2018 ESC/ESH guidelines for the management of arterial hypertension: the Task Force for the Management of Arterial Hypertension of the European Society of Cardiology and the European Society of Hypertension. *J Hypertens* 2018;36:1953–2041.
14. Burnier M, Egan BM. Adherence in hypertension. *Circ Res.* 2019;124(7):1124–40.
15. Salam A, Huffman MD, Kanukula R, et al. Two-drug fixed-dose combinations of blood pressure lowering drugs as WHO essential medicines: An overview of efficacy, safety, and cost. *J Clin Hypertens.* 2020;22:1769–1779.
16. Webster R, Salam A, de Silva HA, et al. Fixed low-dose triple combination antihypertensive medication vs usual care for blood pressure control in patients with mild to moderate hypertension in Sri Lanka: a randomized clinical trial. *JAMA.* 2018;320(6):566–79.
17. Salam A, Kanukula R, Atkins E, et al. Efficacy and safety of dual combination therapy of blood pressure-lowering drugs as initial treatment for hypertension: a systematic review and meta-analysis of randomized controlled trials. *J Hypertens.* 2019;37(9):1768-1774.
17. Salam A, Kanukula R, Atkins E, et al. Efficacy and safety of dual combination therapy of blood pressure-lowering drugs as initial treatment for hypertension: a systematic review and meta-analysis of randomized controlled trials. *J Hypertens.* 2019;37(9):1768-1774.
18. Jafar TH, Gandhi M, de Silva HA, et al. A community-based intervention for managing hypertension in Rural South Asia. *N Engl J Med.* 2020;382(8):717–26.
19. Jeemon P, Séverin T, Amodeo C, et al. World Heart Federation Roadmap for Hypertension - A 2021 Update. *Glob Heart.* 2021;16(1):63. Published 2021 Sep 10. doi:10.5334/gh.1066
20. Fang A, Abdelgadir D, Gopalan A, et al. Engaging patients in population-based chronic disease management: A qualitative study of barriers and intervention opportunities. *Patient Educ Couns.* 2022;105(1):182-189.
21. Schwalm JD, McCready T, Lopez-Jaramillo P, et al. A community-based comprehensive intervention to reduce cardiovascular risk in hypertension (HOPE 4): a cluster-randomised controlled trial. *Lancet.* 2019;394(10205):1231-1242.
22. Bernabe-Ortiz A, Sal Y Rosas VG, Ponce-Lucero V, et al. Effect of salt substitution on community-wide blood pressure and hypertension incidence. *Nat Med.* 2020;26(3):374-378.
23. Schorling E, Niebuhr D, Kroke A. Cost-effectiveness of salt reduction to prevent hypertension and CVD: a systematic review. *Public Health Nutr.* 2017;20(11):1993–2003.