

Concurring the Silent Killer: How to improve hypertension management through Innovative Knowledge Systems in Nyamasheke District, Rwanda

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KEY MESSAGE

16.8% of the Rwandan population have hypertension, with the middle-aged being mostly affected.

In 2019, the World Health Organization (WHO) ranked Rwanda as the first country with the lowest hypertension treatment rate 10.5%.

Controlled hypertension can reduce premature death through complications such as Cardiovascular diseases, Kidney failures, and Stroke.

When the healthcare Providers are continuously exposed to refresher trainings, it will raise the Hypertension control rate from 37.8 to 50.1%
Increasing community NCDs Knowledge will be an innovative way for increasing Hypertension control rate from 37.8 to 48.7%.

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Figure 1. Health providers taking blood pressure measurements during the Healthy Heart Africa project launch in Kigali, Rwanda, in 2022 (Adapted from PATH.Org/Charles Wanga)

PROBLEM STATEMENT

Globally, the growing burden of non-communicable diseases (NCDs), particularly hypertension,

poses a significant challenge to public health and socio-economic development [1,2]. The World Health Organization (WHO) estimates that NCDs account for 41 million deaths worldwide every

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year, with cardiovascular diseases contributing to approximately 17.9 million deaths annually [2], [3]. Hypertension as a major cause of premature death worldwide is estimated in 1.28 billion adults aged 30–79 years worldwide, most (two-thirds) living in low- and middle-income countries, and more than half of adults (58%) with hypertension remain undiagnosed and untreated. The prevalence of hypertension varies across regions and country income groups. The WHO African Region has the highest prevalence of hypertension (27%) compared to that of the WHO Region of the Americas 18% which is the lowest in the world [2].

In Rwanda, NCDs are responsible for an estimated 36% of total deaths, with cardiovascular diseases constituting a substantial portion of this figure [4], [5]. It is estimated that 16.8% of Rwandans have hypertension ; however, that figure jumps to 27.7% among those over 45 [6]. A situation where the middle-aged population experiences the highest prevalence of hypertension can negatively impact the overall progress of a community because it is the middle-aged population that has more stable job security that helps them to care for the older and younger generations. It is also this same age group that provides payment for medical services for the older generation and education for the younger generations in their families. In 2019, WHO ranked Rwanda as the first country with the lowest hypertension treatment rate (10.5%), which is not different from Rwanda's STEP survey 2022 findings, which found that 89.2% of people with hypertension were not on medication [7,8].

A significant proportion of the Rwandan population faces inadequate access to hypertension-related NCD services, which exacerbates the extent of

the problem. This issue is primarily driven by two factors: 1) a widespread lack of knowledge and awareness about hypertension, its risk factors, and prevention strategies among the general population, and 2) low involvement of Healthcare providers in refresher courses and inability to comply with the NCDs Management guidelines. The consequences of these barriers include delayed diagnosis, poor management of hypertension, and increased morbidity and mortality rates, which in turn contribute to a rising disease burden on the healthcare system.

Since 2015, Rwanda has decentralized NCD management from the District hospital level to the Health center level, thereby enhancing access to care for all in need. In 2022, Rwanda initiated a community NCDs screening model by Community Healthcare Providers, which was being piloted in 3 districts [9]. One of those districts is Nyamasheke District, which is one of the largest and most populated districts in Rwanda about half a million [10]. Rwanda HMIS data showed that Nyamasheke District reported the highest number of hypertensive patients in the last quarter of the fiscal year 2022-2023. We believe that tackling the problem of lack of knowledge and awareness about hypertension in the population will increase the treatment rate, which will increase the hypertension control rate.

This policy brief will address the root causes of high rates of hypertension at both patient and health provider level. From the patient level, the policy brief will address the root causes that include poor medication adherence, patients having less knowledge on where and how to notify a healthcare provider of a medication side effect, lack of judgment regarding the various side effects

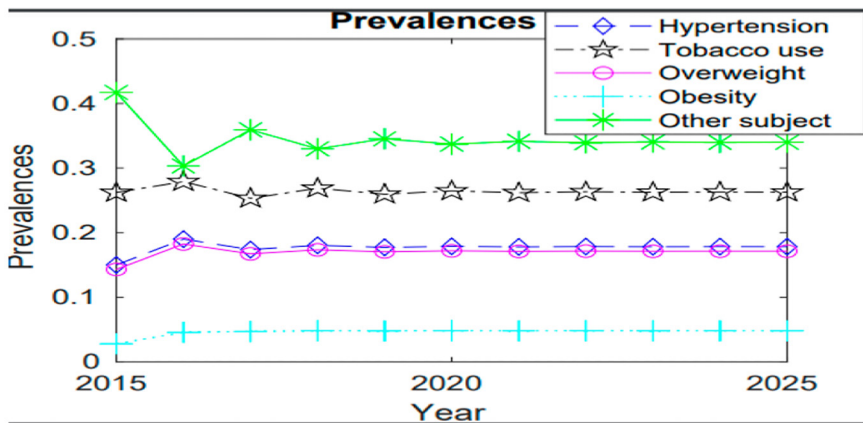


Figure 1: Prevalence of NCDs, including hypertension from 2015-2025 (Source: Dukunde et al. [12])

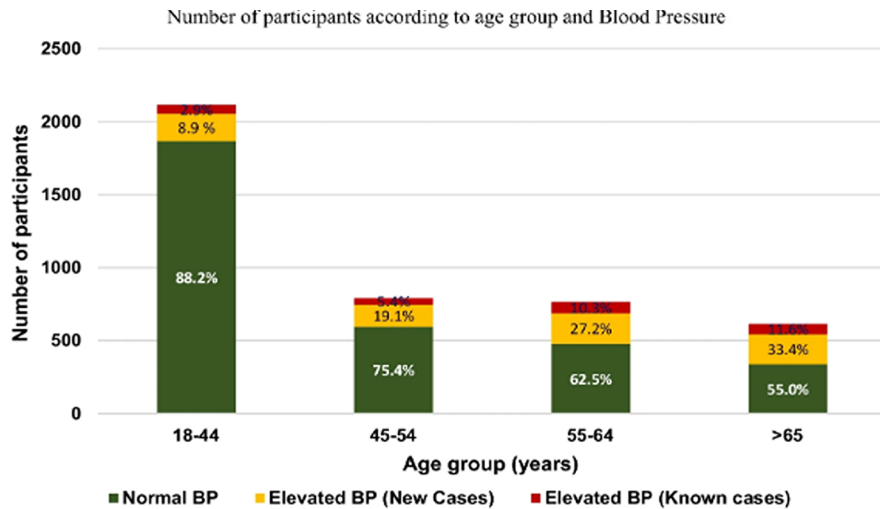


Figure 2: Number of participants according to age group and blood pressure (Source: Ntanganda et al. [13])

and management with other patients, and lack of follow-ups on medical checkups. At a healthcare provider level, the policy brief seeks to address the root causes of lack of appropriate hypertension management skills, workload overload, and staff shortage, lack of clarity about the side effects of medicine, and undetailed note-taking from patient files.

Some of the current actions that have been taken to address the root causes are the hypertension refresher courses for healthcare providers and involving community health workers (CHWs) to test community members for hypertension. However, the enrollment rates of hypertension refresher courses for healthcare providers remain low, and community knowledge about the NCD should be improved [11].

Figure 1 shows a projected steady prevalence of hypertension from 2015-2025, especially among people who are overweight. There is also a higher amount of tobacco use, which can also have an impact on hypertension management. Both smoking and exposure to secondhand smoke increase the risk for the buildup of plaque inside the arteries (atherosclerosis), a process that high blood pressure is known to accelerate [12].

Figure 2 shows higher blood pressure cases among the 55–64-year age group [13]. This is the age group that is normally financially responsible for family structures in Rwanda. Therefore, poorly managed hypertension within this age group can affect education support for younger generations and

overall support for the elderly population groups in Rwanda communities. It is in this case that it is important to improve hypertension management at both healthcare provider and community levels.

POLICY OPTIONS

Policy Options 1. Status Quo:

What: The conventional model of refresher courses is offered, but enrollment in HCP is low, and hypertensive patients meet HCP once a month at the health facility.

Why: The WHO recommends that refresher courses and clinical guidelines for hypertension be offered to HCPs for all regions.

Policy Option 2

What: increase the enrollment of Health care providers in refresher courses by adopting online continuous learning models.

Why: It is a strategy to ensure that healthcare providers are continuously learning and retaining knowledge from refresher courses.

It will enable Healthcare providers to manage Hypertension by complying with guidelines and evidence-based interventions.

This will increase the Hypertension control rate among people with Hypertension.

Feasibility is Moderate: because it will involve hiring developers of the system, hiring staff to maintain the system and address the challenges of the system, and also developing and shooting instruction videos.

Table 1: Cost-effectiveness analysis of the policy options

		Status Quo	Policy2	Policy3
Uncontrolled cases of hypertension	Outcome	45374	8834	9841
	Incremental outcome	-	36540	35533
	Cost of intervention	\$24,278.65	\$51,454.62	\$238,631.71
	Cost per case reduction	-	\$1.46	\$6.72
	Incremental Cost	-	\$27,175.97	\$187,177.08
	ICER	-	\$0.8	\$5.21
	Political Feasibility	High	Moderate	High
	Operational Feasibility	High	High	High

ICER: Incremental cost-effectiveness ratio

Policy Option 3

What: Increase community NCD knowledge through Village NCDs Ambassadors

Why: This will increase knowledge of people with hypertension and create a network of support among people with Hypertension in the village.

It will prevent the dropout of patients into the NCDs Program, which will bring good adherence to medication.

It will also help to address challenges that patients are facing regarding doing follow-up at Health Facilities and adherence to medication.

Feasibility is High: because it has been tried in an HIV program and it is showing positive results, and it will involve hypertensive patients.

The overall objective of the policy options is to decrease the prevalence rate of hypertension through proper management at both clinical and community levels. Policy option 2 tends to the low enrollment of hypertension refresher courses by healthcare providers by promoting the e-learning module of the course as a means to give healthcare providers the flexibility of enrolling for the course at a place of their own convenience. This eliminates burdensome expenses such as transport, accommodation, and physical learning materials. It would also allow the flexibility of healthcare providers working in understaffed healthcare facilities adequate time to enroll and facilitate the refresher courses [14]. This policy option would set an example of how to embrace technological advancements in Rwanda's hypertension refresher courses by providing personalized, engaging, and accessible e-learning opportunities that would be tailored to meet the needs of healthcare providers attending to hypertension patients in Rwanda. The adoption of this policy option is especially befitting

at this time in Rwanda, where the E-learning Africa conference will be held in Kigali in 2024 under the theme, "Education fuels innovation, Investment Amplifies Skills: Africa's vibrant leap forward."

Policy option 3 seeks to decrease hypertension prevalence by engaging community members as part of the solution to the problem. This option would equip hypertension ambassadors through multidisciplinary team workshops so that they can effectively guide community members towards adopting healthier ways of living that would contribute to their better management of hypertension at home. The ambassadors would be trained to guide different population groups about how to properly manage hypertension based on their food consumption patterns, their coping mechanisms regarding stress, and overall health-seeking behaviors that are influenced by their culture and religion. With this policy option, it has been identified that men tend to abuse alcohol and tobacco as a way of coping with stress because of gender norms where men are expected to not express their negative emotions [6].

Thus, it is essential that community-level training workshops for NCD ambassadors include experts in alcohol and tobacco abuse to teach the ambassadors about the link between alcohol and tobacco abuse and hypertension. The community-level workshops will also include nutritionists who will teach about healthier eating patterns that are essential for hypertension management at the community level. In this case, the nutritionist would address the issue of the gendered consumption of fruits and vegetables, where cultural and religious norms have prescriptions about how men and women should consume fruits and vegetables. For example, the association of meat consumption

Table 2: Breakdown of what should happen to implement the intervention

Policy Option 2	Policy Option 3
Continue with conventional method of providing refresher courses to healthcare providers	Organize workshops to increase knowledge of Non-Communicable Diseases (NCDs) ambassadors about living with hypertension in the community
Develop E-learning materials for the refresher course	These workshops should consist of multidisciplinary facilitators that are inclusive of:
Develop instruction videos to be included in the online module	-nutritionists -Alcohol and tobacco abuse specialists -NCD specialists These facilitators will collectively develop a tool to train the community NCD ambassadors
Hire a developer to develop the system of E-learning	Select 15 Sectors NCD ambassadors, and 1176 village NCD ambassadors
Tend to the monthly fee for maintaining the system domain	Communication fee for ambassadors to keep contact with Hypertension patients

with masculinity and the association of fruit and vegetable consumption with femininity [15,16,17].

The economic evaluation results for improving hypertension control in Rwanda, more specifically Nyamasheke District, involves three interventions: (i) Status quo; (ii) increase the enrollment of Health care providers in refresher courses by adopting online continuous learning models, and (iii) Increase community NCDs Knowledge through Village NCDs Ambassadors

Among these, increasing the enrollment of health care providers in refresher courses by adopting online continuous learning models is the most cost-effective policy with a cost of \$51,454.62 with the improvement of 12.3% of controlled hypertensive patients, translating to ICER of \$0.8 (Table 1). Increasing community NCD knowledge through Village NCD ambassadors also improves the Control rate at 10.9%, but it does so at a higher cost compared to our policy option 2. However, implementing each intervention is far below the ICER threshold for a lower-income country such as Rwanda. In this case, we favor adopting both policy options to improve controlled hypertension cases in the Nyamasheke District.

Combining political and operational feasibility assessments, the results emphasize that increasing the enrollment of health care providers in refresher courses by adopting online continuous learning models can contribute highly to addressing

the problem of high uncontrolled rates among hypertensive patients in Rwanda.

RECOMMENDATIONS AND NEXT STEPS

We recommend the intervention of combining policy options 2 and 3 as this will contribute towards controlling hypertension cases by 12.3% and 10.9%, respectively, in the district. This will assist with keeping people healthier in the most cost-effective way, which also translates to securing the livelihoods and upkeep of the young and elderly who are under the care of the population group affected mainly by hypertension. Table 2 shows the breakdown of implementation procedures of these policy options.

In implementing these policy options, we take lessons from the successes in Brazil, where the Agita Sao Paulo Program successfully increased community awareness about hypertension and promoted healthy lifestyles by organizing community workers who encouraged physical activity and a balanced diet [18].

With our policy option 3, we take lessons from the adoption of the e-learning refresher courses in the United States of America (USA), where the combination of the e-learning and conventional modules assisted health workers with remembering course materials over longer periods of time and helped them perform an average of 3.4 more skills

compared to the control group that only did the conventional refresher course [14].

It is needed to take actions to increase the control rate of hypertension in Rwanda to avoid further complications that may lead to premature death and hinder the health progress that Rwanda has made so far.

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