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## PASCAR

### WHF CVD Scorecards

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# PASCAR WHF CVD Scorecards

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# The World Heart Federation and Pan-African Society of Cardiology Cardiovascular Disease Scorecard project for Africa

Worldwide, the leading cause of death is cardiovascular diseases (CVD). Therefore, the World Heart Federation (WHF) is committed in leading the fight against this debilitating disease and its risk factors. Most premature deaths caused by CVD are preventable and the WHF along with heart organisations are working towards reducing CVD mortality by 25% by 2025/30 in countries throughout the world.<sup>1</sup>

In 2018, the WHF approached the Pan-African Society of Cardiology (PASCAR) to co-ordinate data collection and reporting for a continental and national-level CVD scorecard tool to be used in Africa. The aim of the Scorecard project is to create a picture of the current state of CVD prevention, control and management in 12 African countries feeding it into a systemised assessment of cardiovascular policy on a global scale.<sup>2</sup>

The scorecard involves a core set of indicators with the prospect of understanding the epidemiological situation in each country under investigation. Furthermore, it will assist in evaluating CVD prevention and management programmes, identify policy gaps, and address advocacy for particular policies or programmes.<sup>2</sup> Moreover, the CVD scorecards are a useful tool to highlight limitations on existing data and therefore contribute to strengthening health information systems.

According to the experience of the WHF and PASCAR, heart health advocates can best campaign for change when armed with a comprehensive overview of the burden of CVD, along with policies and services in place to address this. By measuring the national response to CVD, countries are better able to distinguish priorities, map progress and ultimately, be held accountable for action to promote better heart health outcomes.

Therefore the following objectives were identified to achieve these outcomes through the scorecard:

- assess and visualise the state of national CVD prevention and management programmes
- highlight progress on the path to achieving the sustainable development goal target 3.4 [to reduce premature mortality from non-communicable diseases (NCD) through prevention and treatment by one-third in 2030, and promote mental health and wellbeing] and motivate countries to take action

- identify key policy gaps and create a sense of urgency for action needed at national and global level
- help prioritise specific policies or programmes to better align resources to areas of need.

The scorecard comprises four parts with sub-sections. Part A: demographics, which include data on the specific heart organisation that assisted PASCAR; the country's classification according to the World Bank; life expectancy at birth; the percentage of population living in rural and urban areas; the gross domestic product (GDP) per capita in current US\$; the general government health expenditure as a percentage of the GDP; and the poverty head count ratio at \$1.90 a day as a percentage of the population.

Part B: the national CVD epidemic, constitutes the national burden of CVD and NCD, which includes risk factors such as tobacco use, hypertension, excess body weight, physical inactivity, and diabetes. Part C: clinical practice and guidelines, deals with the health system capacity, essential medicines and interventions, and secondary prevention and management. Part D: CVD governance covers assessing the policy response and stakeholder actions.

In collaboration with the national cardiac societies and partners in the 12 African countries, data were collected and verified of which two country reports, Sudan<sup>3</sup> and Cameroon,<sup>4</sup> have been published. In this supplement, we present country reports for Mozambique, Namibia, Nigeria, Rwanda, Tanzania, Uganda and Zambia.

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# Mozambique Country Report

## PASCAR and WHF Cardiovascular Diseases Scorecard project

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### Abstract

Data collected by the Pan-African Society of Cardiology for the World Heart Federation's Scorecard project regarding the current state of cardiovascular disease prevention, control and management along with related non-communicable diseases in Mozambique are presented. Furthermore, the strengths, threats, weaknesses and priorities identified from these data are highlighted in concurrence with related sections in the incorporated infographic. Information was collected using open-source datasets available online and relevant government publications.

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On behalf of the World Heart Federation (WHF), the Pan-African Society of Cardiology (PASCAR) co-ordinated data collection and reporting for the country-level Cardiovascular Diseases Scorecard to be used in Africa.<sup>1,2</sup> The Heart Association of Mozambique (AMOCOR), a member of PASCAR and the WHF, and the Division of Chronic and Non-Communicable Diseases at the National Health Institute in Mozambique assisted the PASCAR team in collating and verifying these data. We used open-source datasets from the World Bank, the World Health Organization (WHO), Institute for Health Metrics and Evaluation, and the International Diabetes Federation (IDF), along with relevant government publications to collect information.

### Part A: Demographics

According to the World Bank (2018), Mozambique is a low-income country with 64% of its people living in rural

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areas.<sup>3</sup> In 2014, almost 63% of the population were living below the US\$1.9-a-day ratio. Life expectancy at birth in 2018 was 57 years for men and 63 years for women.<sup>3</sup> The general government health expenditure was 1.5% of the gross domestic product (GDP) in 2017, while the country GDP per capita was US\$499 in 2018.<sup>3</sup>

### Part B: National cardiovascular disease epidemic The national burden of cardiovascular disease (CVD) and non-communicable diseases (NCD) risk factors

Mozambique's premature deaths attributable to CVD (30–70 years old) were similar to Tanzania and Senegal at 8% in 2012, which is the second lowest after Ethiopia's 6%.<sup>4</sup> In 2017, the age-standardised total CVD death rate was about 11.6%, which is lower than the neighbouring countries, Tanzania (12.9%) and South Africa (16.1%).<sup>5</sup> The percentage of disability-adjusted life years (DALYs) resulting from CVD was 4.9%. The prevalence of atrial fibrillation (AF) and atrial flutter was 0.1%, while that of rheumatic heart disease (RHD) was 3.04%.<sup>6</sup> The total RHD mortality was 0.16% of all deaths (Table 1).<sup>5</sup>

### Tobacco and alcohol

The prevalence of tobacco use in adult men and women ( $\geq 15$  years old) was about 22.8 and 3.2%, respectively.<sup>7</sup> Data for the young population (13–15-year-olds) on tobacco use came from the Global Youth Tobacco Survey (GYTS)<sup>8</sup> that indicated a prevalence of 9.3 and 8.2% in boys and girls, respectively. No data were available on the premature CVD mortality attributable to tobacco or the estimated annual direct cost of tobacco use (Table 1).<sup>9</sup> The three-year (2016–18) average recorded alcohol consumption per capita ( $\geq 15$  years) was 1.2 litres (Table 1).<sup>10</sup>

### Raised blood pressure and cholesterol

The percentage of men and women, 15–64 years old, with raised blood pressure (BP) (systolic BP  $\geq 140$  or diastolic BP  $\geq 90$  mmHg) was 31.2 and 31.5%, respectively, while the overall prevalence among those aged 25–64 years was 38.9% in 2015.<sup>7,11</sup> The percentage of DALYs lost because of hypertension was 3.5%, whereas mortality caused by hypertensive heart disease was 1.13% in 2017.<sup>5</sup> The estimated age-standardised raised total cholesterol (TC  $\geq 5.0$  mmol/l) in 2008 was 26% (Table 1).<sup>10</sup>

## Physical activity

In 2016, the percentage of adolescents (11–17 years old) who were insufficiently active was 87.1%.<sup>12</sup> For adults, the age-standardised estimate of those who were insufficiently active [ $< 150$  minutes of moderate-intensity physical activity (PA) per week or  $< 75$  minutes of vigorous-intensity PA per week] was 5.8% (Table 1).<sup>13</sup>

## Overweight and obesity

In 2015, the prevalence of overweight [body mass index (BMI)  $\geq 25$  to  $< 30$  kg/m<sup>2</sup>] was 18.2% for men and 30.5% for women 18–64 years old.<sup>14</sup> In adults, 25–64 years old, obesity (BMI  $\geq 30$  kg/m<sup>2</sup>) in men was 5.0%, while in women, the prevalence was 13.0%.<sup>14</sup> The overall obesity prevalence among these adults was 9.7% compared to the Global Health Observatory (GHO) data of 13.1% (Table 1).<sup>10</sup>

## Diabetes

The percentage of the population defined with a fasting glucose level  $\geq 7.0$  mmol/l or on medication for raised blood glucose levels (age-standardised) in 2014 was 6.6 and 6.2% for men and women, respectively.<sup>10</sup> Diabetes prevalence (ages 25–64 years) was 7.4%,<sup>7</sup> which is higher than that of 3.9% for Africa but below the global level of 9.3% (Table 1).<sup>15</sup>

## Part C: Clinical practice and guidelines

### Health system capacity

The country had an average of 0.8 physicians and 6.9 nurses per 10 000 of the population in 2018, with seven hospital beds per 10 000 people in 2011.

In Mozambique, locally relevant clinical tools to assess CVD risk at a national level have been implemented.<sup>7,16</sup>

Table 1. Cardiovascular disease indicators for Mozambique

Indicators	Male	Female	Total	Year
<b>Status of the national CVD epidemic</b>				
Premature CVD mortality (30–70 years old) (% deaths)	-	-	8	2012
Total CVD mortality (% of deaths)	11.4	11.9	11.6 (31.8)*	2017
Total RHD mortality (% of deaths)	0.15	0.17	0.16 (.5)*	2017
DALYs attributable to CVD (%)	5.3	4.4	4.9 (14.7)*	2017
AF and atrial flutter (%)	0.11	0.09	0.1 (.5)*	2017
Prevalence of RHD (%)	-	-	3.04 (.5)*	2007
<b>Tobacco and alcohol</b>				
Prevalence of adult tobacco use ( $\geq 15$ years old) (%)**	22.8 (36.1) <sup>†</sup>	3.2 (6.8) <sup>†</sup>	14.9	2015
Prevalence of youth (13–15-year-olds) tobacco use (%)**	9.3 (18.4) <sup>†</sup>	8.2 (8.3) <sup>†</sup>	9.1	2013
Estimated direct (healthcare-related) cost of tobacco use in your population (current US\$)	-	-	-	2018
Proportion of premature CVD mortality attributable to tobacco (%)	-	-	- (10)*	2004
Recorded alcohol consumption per capita ( $\geq 15$ years) (litres of pure alcohol) (three-year average)	-	-	1.2	2016–18
<b>Raised blood pressure and cholesterol</b>				
Population (15–64 years old) with raised blood pressure (SBP $\geq 140$ mmHg or DBP $\geq 90$ mmHg) (%)**	31.2 (24.1) <sup>†</sup>	31.5 (20.1) <sup>†</sup>	-	2015
Population with raised TC ( $\geq 5.0$ mmol/l) (%)	26.1	25.9	26 (38.9) <sup>†</sup>	2008
DALYs attributable to hypertension (%)	3.8	3.2	3.5 (8.7)*	2017
Mortality caused by hypertensive heart disease (% of deaths)	0.7	1.66	1.13 (1.7)*	2017
<b>Physical activity</b>				
Adolescents (11–17 years old) who are insufficiently active ( $< 60$ minutes of moderate- to vigorous-intensity PA daily) (%)	83.0	91.3	87.1 (80.7) <sup>†</sup>	2016
Adults (age-standardised estimate) who are insufficiently active ( $< 150$ minutes of moderate-intensity PA per week or $< 75$ minutes of vigorous-intensity PA per week) (%)	5.5	6.2	5.8 (27.5) <sup>†</sup>	2012
<b>Overweight and obesity</b>				
Adults (18–64 years old) who are overweight (BMI $\geq 25$ – $< 30$ kg/m <sup>2</sup> ) (%)**	18.2	30.5	- (38.9) <sup>†</sup>	2015
Prevalence of obesity (BMI $\geq 30$ kg/m <sup>2</sup> ) (adults 25–64 years old) (%)**	5.0	13.0	9.7 (13.1) <sup>†</sup>	2015
<b>Diabetes</b>				
Defined population with fasting glucose $\geq 126$ mg/dl (7.0 mmol/l) or on medication for raised blood glucose (age-standardised) (%)	6.6 (9) <sup>†</sup>	6.2 (8) <sup>†</sup>	6.4	2014
Prevalence of diabetes (25–64 years old) (%)**	-	-	7.4 (9.3) <sup>††</sup>	2015

CVD, cardiovascular disease; RHD, rheumatic heart disease; DALYs, disability-adjusted life years; AF, Atrial fibrillation; SBP, systolic blood pressure; DBP, diastolic blood pressure; TC, total cholesterol; PA, physical activity; BMI, body mass index.

\* IHME Global data exchange<sup>5</sup>

\*\* STEPS 2014/15<sup>7</sup>

<sup>†</sup> WHO GHO data<sup>10</sup>

<sup>††</sup> IDF Diabetes Atlas.<sup>15</sup>

No recent clinical guidelines for CVD prevention are available. Although clinical guidelines for the detection and management of AF along with those for the management of pharyngitis and acute rheumatic fever have not been developed, those for RHD management are being addressed (AOM, pers commun). As part of the REMEDY study, a prospective, international, multi-centre, hospital-based registry, and ongoing INVICTUS GTRial (INVESTigation of rheumatic AF Treatment Using vitamin K antagonists, rivaroxaban or aspirin Studies), Mozambique has clinical registers of people with a history of rheumatic fever and RHD.<sup>17,18</sup> No system is available to measure the quality of care provided to people who have suffered acute cardiac events, or national guidelines for the treatment of tobacco dependence. In collaboration with the World Diabetes Foundation and International Diabetes Federation (IDF) African Region, treatment guidelines for diabetes were developed to suit sub-Saharan African trends and specifically Mozambique conditions.<sup>19,20</sup>

### Essential medicines and interventions

In 2019, angiotensin converting enzyme (ACE) inhibitors, aspirin, metformin and insulin were available in the public sector but not statins, as indicated by the WHO's GHO.<sup>10</sup> However, insulin was reported not always being available and not everywhere.  $\beta$ -blockers, such as propranolol and atenolol are widely available, whereas clopidogrel was not available.<sup>21,22</sup>

Provision for secondary prevention of rheumatic fever and RHD is not part of Mozambique's national prevention and control programme in the public health sector, and CVD risk stratification is not in place. However, according to the GHO, TC measurement has been available at the primary healthcare level since 2015, although discontinuity in the supply of laboratory reagents is frequent, even in urban areas.<sup>10</sup>

### Secondary prevention and management

Assessing the measures in place for secondary prevention and management of CVD, no information is available regarding the percentage of patients with AF on treatment, and less than 5% of those with a history of CVD are taking aspirin, statin and at least one antihypertensive (AD pers commun). In 2015, only 14.5% of the adults with hypertension were aware and 7.3 and 3.2% of all hypertensive people had their blood pressure controlled.<sup>11</sup>

## Part D: Cardiovascular disease governance

Mozambique developed a national strategic plan for the prevention and control of NCD including CVD and their risk factors, such as diabetes, within a small unit in the Ministry of Health (MoH).<sup>23</sup> However, there is no dedicated budget for its implementation. A national programme is being implemented to address RHD prevention and control as a priority.<sup>24</sup> Mozambique also has a national surveillance system that includes CVD and their risk factors every 10 years.<sup>7</sup> According to the WHO framework convention on tobacco control (FCTC), there is no national tobacco control

plan or a national multi-sectoral co-ordination mechanism for tobacco control.<sup>25</sup> However, some control policies had already been implemented by the time the country had approved the FCTC in 2017.<sup>26</sup>

Collaborative projects for NCD interventions, which include CVD, have been implemented between the MoH, non-health ministries and civil societies.<sup>27</sup> The government's total annual expenditure on cardiovascular healthcare is difficult to assess (AD, pers commun). Although Mozambique was included in the WHO-CHOICE (CHOosing Interventions that are Cost Effective) project that assists countries with health policy and planning, no modelling tool incorporating cost-effectiveness benefits of CVD prevention and control has been implemented.<sup>28</sup>

### Assessment of policy response

Legislation mandating health financing for CVD is not available. Although legislation mandating essential CVD medicines at affordable prices is lacking, Mozambique subsidises drug prices in the public sector at 20–100% of their value.<sup>29</sup> However, most of the time, these drugs are not available or in insufficient quantities. According to Russo and McPake,<sup>30</sup> possible reasons were depicted as to why medicines are unaffordable in low-income countries such as Mozambique. These researchers mentioned that two para-statal enterprises, Medimoc and FARMAC pharmacies, used to be the only importer and distributor, respectively. The more sophisticated and expensive drugs, such as CVD medicines, were only available through the private sector and the high prices could be ascribed to world manufacturing and trade policies. They concluded that controlling prices is not the best way to legalise access to medicines in low-income countries, and suggested demand and supply for cheaper drugs would be a more appropriate policy option.<sup>30</sup>

Legislation is employed in areas where smoking is banned, clear and visible warnings have been introduced on at least half the principal display areas of tobacco packs, and advertising, promotion and sponsorship of tobacco have been banned.<sup>25</sup> There are no measures to protect tobacco control policies from tobacco industry interference.<sup>25</sup> In 2013, the excise tax of the final consumer price of tobacco products was 65% for imported and domestically produced cigarettes.<sup>31</sup> However, in 2016, excise tax for tobacco products was reported to be 75%,<sup>32</sup> with the most popular 20-pack cigarettes rendering about 17% excise tax,<sup>26</sup> while that for alcohol is variable (AD, pers commun). No information is available on policies ensuring equitable nationwide access to healthcare professionals and facilities, neither have policies been implemented that ensure screening of individuals at high risk of CVD.


There is no sustainable funding for CVD from taxation or any taxes on unhealthy foods or sugar-sweetened beverages.<sup>33</sup> No legislation banning the marketing of unhealthy foods to minors exists nor that mandating clear and visible warnings on foods that are high in calories, sugar or saturated fats. Policy interventions that promote a diet to reduce CVD risk and those that facilitate PA have also not been developed.

**MOZAMBIQUE – JULY 2020**



**Status of Cardiovascular Disease (CVD) and Non-communicable diseases (NCD)**

**Country Demographics**


World Bank Classification  
**Low income**



**64%**  
of population living in rural areas  
60% (Sub-Sahara Africa)

**0.16%**  
of total mortality caused by RHD  
Global data: 0.51%

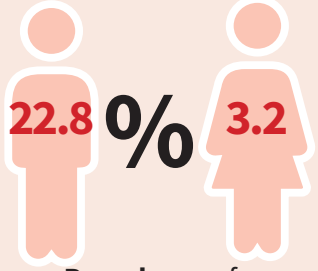



**3.04%**  
Prevalence of rheumatic heart disease (RHD)  
Global data: 0.53%




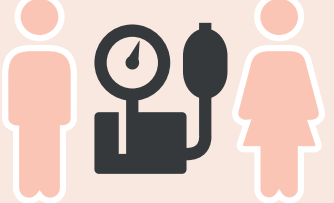

**No Data**  
of premature CVD mortality attributable to tobacco  
Global data: 10%

**22.8%** MALE **3.2%** FEMALE  
Prevalence of tobacco use age ≥15  
Global data: 36.1% (male) 6.8% (female)

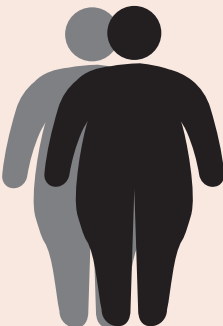



**1.13%**  
of deaths caused by hypertensive heart disease  
Global data: 1.65%


**31.2%** MALE **31.5%** FEMALE  
of population with raised blood pressure (SBP ≥140 or DBP ≥90)  
Global data: 24.1% (male) 20.1% (female)

**9.7%**




Prevalence of obese adults (BMI of ≥30 kg/m<sup>2</sup>)  
Global data: 13.1%



**11.62%**  
of deaths caused by CVD  
Global data: 31.8%

**26%**



of population with raised total cholesterol (≥5.0 mmol/L)  
Global data: 38.9%



**7.4%**  
Prevalence of diabetes (ages 20-79)  
3.9% (Africa)

**MOZAMBIQUE**







**MOZAMBIQUE**

**Health System Capacity**



**0.8**

Number of physicians (per 10,000 population)



**6.9**

Number of nurses (per 10,000 population)



**7**

Number of hospital beds (per 10,000 population)

**KEY:**

No data



Not in place



In process/ partially implemented



In place



**Clinical Practice and Guidelines**

Locally-relevant (national or subnational level):

Clinical tool to assess CVD risk .....

Guidelines for treatment of tobacco dependence .....

**Clinical Guidelines for:**

The detection and management of atrial fibrillation .....

The detection and management of acute rheumatic fever .....

The detection and management of rheumatic heart disease .....

The detection and management of diabetes .....

CVD prevention (within the last 5 years) .....

A system to measure the quality of care provided to people who have suffered acute cardiac events .....

MOZAMBIQUE

**Cardiovascular Disease Governance**

**A national strategy or plan that addresses:**

CVDs and their specific risk factors .....

NCD and their risk factors .....

Rheumatic heart disease prevention and control as a priority .....

A national surveillance system that includes CVDs and their risk factors .....

**Stakeholder action**

Non-governmental organizations' advocacy for CVD policies and programmes .....

Civil society involved in developing and implementing of national CVD prevention and control plan .....

For more information, please email [info@worldheart.org](mailto:info@worldheart.org) [info@pascar.org](mailto:info@pascar.org)

### Stakeholder action

Non-governmental organisation (NGO) advocacy for CVD policies and programmes in Mozambique are available on CVD and cancer (AD, pers commun). However, there is no active involvement of patient organisations in advocacy for CVD/NCD prevention and management or advocacy champions identified for RHD.

According to the Mozambique FCTC, unidentified NGOs participated in developing and implementing a national tobacco control plan that was approved by government in 2017.<sup>25</sup> Involvement of civil society in the development and implementation of a national CVD prevention and control plan is being implemented through the Non-Communicable Diseases and Injury group.<sup>34</sup> However, that of civil society in a national multi-sectoral co-ordination mechanism for combating NCD/CVD is absent. Specific activities by cardiology professional associations aimed at a 25% reduction in premature CVD mortality by 2025 have been implemented (AD, pers commun). Hypertension screening at workplaces only takes place during May Measurement Month activities (wellness days).<sup>35,36</sup>

As part of the data collected for Mozambique, the following strengths, weaknesses, threats and priorities are summarised.

### Strengths

Non-communicable diseases were included in Mozambique's national health policy and through the national strategic plan that was approved in 2008.<sup>23,37</sup> The aim of the Strategic Plan for the Prevention and Control of NCD was to create a positive environment whereby exposure to risk factors would be reduced and access to care improved.<sup>20</sup> The MoH developed diabetes and hypertension projects that could be utilised in other NCD. Also, through the MoH and the dedication of local champions, international support was gained to improve diabetes care, which was incorporated into its National Plan for NCD.<sup>20</sup> Several outcomes of this plan have been:

- NCD focal points that were set up in all the provinces to adjust the principles of the plan to each setting
- an alliance on NCD, which included departments from the MoH, members of civil society, the media and the general population was established
- an NCD unit that was created within the MoH
- an increase in the visibility of the diabetes association in the community that was also strengthened
- consultations for diabetes and hypertension that were established in 2006 and functioning at 12 health centres in Maputo, two provincial health centres as well as 10 hospitals by 2009
- improved supply and availability of insulin, diagnostic tools and trained healthcare workers, which have led to an estimated increase in life expectancy.

A national surveillance system, the STEPS survey, including CVD and their risk factors, is implemented every 10 years.<sup>38</sup> Mozambique is probably one of the few African countries with two national representative surveys. Not only has the prevalence of hypertension been reported but also

that of awareness, treatment and controlled hypertension.<sup>11</sup>

In a study comparing PA levels and patterns among adults across 22 African countries, Mozambique had the highest prevalence at 96.2%, meeting the WHO recommendations, with Ethiopia (85.7%) and Zambia (84.2%) trailing behind but still at excellent levels.<sup>39</sup>

Recommendations to improve and increase the role of the Diabetes Association, and implement chronic disease law, stating that people with diabetes and other chronic conditions should receive an 80% subsidy on their medicines, were suggested.<sup>20</sup>

The Mozambique NCDI Poverty National Group, a multi-sectoral platform that aggregates government leads, researchers and clinical implementers, supports the expansion of the NCDI national agenda by focusing on an equitable approach for the entirety of the NCDI burden among the poor and the young.<sup>40</sup> The aim is to provide technical support to the government to deploy efforts in addressing neglected CVD, such as RHD, cardiomyopathies and related infections such as tuberculosis and schistosomiasis.<sup>40</sup> The NCDI recently started a priority-setting exercise (including all NCD) to define priority conditions and effective interventions.

There is also an ongoing open-heart surgery programme at the main public hospital of Maputo.<sup>41</sup> Also, cardiac catheterisation has been performed at Mozambique's main referral hospital since 2015.

### Threats

Although life expectancy has improved slightly, NCD affect the epidemiological profile of Mozambicans.<sup>42</sup> CVD are the leading NCD cause of morbidity and mortality, with hypertension as the primary risk factor, which increases with age.<sup>42</sup> Another important cause of NCD and premature death is diabetes, which is also responsible for an increased risk of CVD.<sup>42</sup> In 2011, at the United Nations General Assembly meeting, Mozambican President Armando Guebuza indicated a steady increase in the incidence of NCD, which mostly affected the workforce by placing an extra burden on the economy.<sup>37</sup>

In 2016, the prevalence of diabetes was 4.6%,<sup>43</sup> which is higher than that reported by the IDF three years later for Mozambique (3.3%) and Africa (3.9%).<sup>15</sup> Although low, most people with diabetes are not aware of or on treatment for the condition, which consequently creates barriers in providing sufficient care.<sup>19</sup> Related risk factors adding to increased CVD risk are overweight and obesity, along with raised BP (31.4%) that was higher than the global prevalence of 22.1%.<sup>7</sup>

The GYTS, a nationally representative school-based survey conducted in 2013, indicated 9.1% of adolescents used tobacco.<sup>8</sup> Further findings showed that 19.1 and 37.4% of these adolescents were exposed to tobacco smoke at home and in confined public places, respectively.<sup>8</sup> In 2015, 22.8% of adult men used tobacco (manufactured and hand-made cigarettes), while 3.2% of women adopted the habit. For smokeless tobacco, more women (4.6%) than men (1.1%) made use of the practice.<sup>7</sup>

Compared to neighbouring countries South Africa (1.01%) and Tanzania (1.01%), Mozambique had a much

higher prevalence of RHD, at 3.04%.<sup>6</sup> Total RHD mortality (0.16%), was somewhat higher than that of Tanzania (0.14%) but lower than South Africa's 0.22%.<sup>5</sup>

### Weaknesses

Six of the eight essential medicines for CVD were only available some of the time and only in some of the public health centres (AD, pers commun). Only metformin is generally available at primary care facilities, while insulin is not.<sup>43</sup> In a study by Beran *et al.*<sup>44</sup> published in 2005, insulin was not reportedly available at any of the six health centres.

Primary healthcare facilities generally do not provide TC measurements, and CVD risk stratification at this level is also not prioritised. Very few people with hypertension and CVD are receiving treatment.<sup>38</sup> Only in 2017 after a long process did Mozambique ratify the FCTC. However, at the time, some tobacco control policies had already been implemented,<sup>24</sup> while national guidelines to treat tobacco dependence are lacking. Sustainable funding for CVD from taxation of tobacco or other 'sin' products also does not exist.

No locally relevant CVD/NCD guidelines are available. Mozambique, along with most sub-Saharan African countries except South Africa, has not yet introduced a policy regarding the taxation of unhealthy foods or sugar-sweetened beverages to combat obesity and other related NCD.<sup>45</sup> Legislation banning the marketing of unhealthy foods to minors and mandating clear and visible warnings on foods that are high in calories, sugar or saturated fats are also lacking. Policy interventions to reduce CVD risk through promoting a healthy diet has not yet been introduced. Stakeholder involvement shows little evidence, although there have been indications of civil society involvement in preventing CVD.<sup>25,34,35,42</sup>

Weaknesses in the surveillance systems do not allow the recognition of the burden of neglected CVD in Mozambique. However, some are highly relevant (e.g. RHD prevalence and cardiomyopathies) and have been included in the new strategic plan of the National Public Health Institute, prioritising research, education and surveillance of these conditions.<sup>46,47</sup>

### Priorities

Mozambique's National Strategic Plan for the prevention and control of NCD was introduced in 2008 to create a positive environment to minimise or eliminate the exposure to risk factors and guarantee access to care.<sup>20,23</sup> In the next *Plano Estratégico do Sector da Saúde* (PESS) that outlines the 2014–2019 strategies for Mozambique, one of its top priorities is to reduce the NCD burden.<sup>42</sup> As part of the NCD programme, a few strategic goals were highlighted. These included health-promoting activities such as the prevention and treatment of NCD by training healthcare personnel and increasing services; developing plans and guidelines for NCD; strengthening and expanding surveillance systems, along with advocacy for increased community and civil society involvement in preventing and controlling NCD and related risk factors.<sup>42</sup>

Another priority is diabetes care in Mozambique that is changing, compelling them to assess these changes to stem the rising tide of this risk factor.<sup>19</sup>

The tobacco control plan progress needs to be evaluated, as the problem remains despite the increase in excise tax. In a country brief, the World Bank Group Global Tobacco Control Program recommended fiscal and public health benefits for Mozambique. These included unified cigarette-specific excise rates with annual increases to reduce consumption; increased cigarette taxes and prices to reduce cigarette smuggling; and improved tobacco control monitoring.<sup>26</sup>

This publication was reviewed by the PASCAR governing council and written in association with the Heart Association of Mozambique.

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# Namibia Country Report

## PASCAR and WHF Cardiovascular Diseases Scorecard project

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### Abstract

Data collected for the World Heart Federation's Scorecard project regarding the current state of CVD prevention, control and management along with related non-communicable diseases in Namibia are presented. Furthermore, the strengths, threats, weaknesses, and priorities identified from these data are highlighted in concurrence with related sections in the attached infographic. Information was collected using open-source data sets available online and relevant government publications.

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On behalf of the World Heart Federation (WHF), Pan-African Society of Cardiology (PASCAR) co-ordinated data collection and reporting for the country-level Cardiovascular Diseases Scorecard for Africa.<sup>1,2</sup> Namibia does not yet have a cardiac/heart society that could assist PASCAR in collating the data. However, a paediatric cardiologist at Windhoek Central Hospital (WCH) assisted with information on rheumatic heart disease (RHD), along with an adult cardiology fellow in training, who aided the adult data. These specialist cardiologists verified their respective data fields. A consultant cardiologist, Dr Simon I Beshir (SIB), from the Namibia Heart Centre of the Roman Catholic Hospital provided information on the adult CVD data.

Based on the data collected, we summarise the strengths (achievements), threats, weaknesses and priorities identified, which need to be considered in conjunction with the associated sections in the accompanying infographic. Datasets that

were used included open-source data from the World Bank, World Health Organization (WHO), Institute for Health Metrics and Evaluation, the International Diabetes Federation and government publications. Although Namibia has made some progress toward the provision of comprehensive cardiovascular care, there are still gaps, probably as a result of fragmented and unco-ordinated responses, with limited funding, human resources and technical capacity. Staff shortages and a lack of essential equipment and support at state and private cardiac centres are some of the reasons for the dearth of published research-related activities in Namibia.

### Part A: Demographics

With a population of 2.3 million people and spanning 825 419 km<sup>2</sup>, Namibia is a sparsely populated country. According to the World Bank (2018), Namibia is an upper-middle-income country with 50% of its people predominantly in northern Namibia living in rural areas.<sup>3</sup> In 2015, 13.4% of the population were living below the US\$1.9-a-day ratio. Life expectancy at birth in 2018 was 60 years for men and 66 years for women. The general government health expenditure was 3.9% of the gross domestic product (GDP) in 2017, while the country GDP per capita was US\$5931.5 in 2018.<sup>3</sup>

### Part B: National cardiovascular disease epidemic The national burden of cardiovascular disease (CVD) and non-communicable diseases (NCD) risk factors

Namibia's premature deaths attributable to CVD (30–70 years old) in 2012 were 12%, which is slightly lower than neighbouring country, South Africa, at 14%, but higher than Mozambique's at 8%. In 2017, the age-standardised total CVD death rate was 17.7%, which was higher than that of South Africa and Mozambique at 16.1% and 11.6%, respectively. However, compared to the 31.8% for the Global Burden of Disease (GBD) data, Namibia's total CVD deaths were lower.<sup>4</sup> The percentage of disability-adjusted life years (DALYs) resulting from CVD for men was 7.1 and 6.2% for women, which is lower than the GBD at 14.7% for both genders. The prevalence of atrial fibrillation (AF) and atrial flutter was 0.2%, while that of RHD was 0.94% compared to the GBD data of 0.53%. The total RHD mortality was 0.27% of all deaths, which is lower than the GBD data (0.51%) (Table 1).<sup>4</sup>

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## Tobacco and alcohol

The prevalence of tobacco use in adult men and women ( $\geq 15$  years old) was 38.9% and 11.4%, respectively, which is higher than comparative Global Health Observatory (GHO) data of 36.1% for men and 6.8% for women.<sup>5</sup> Data available for adolescents (13–15-years-old), indicated 31.9% of boys and 29.9% of girls used tobacco in 2008.<sup>6</sup> The estimated annual direct cost of tobacco use is not known. The premature CVD mortality attributable to tobacco is 4% of the total mortality and much lower than that of the global 10%.<sup>7</sup> The three-year (2016–18) average recorded alcohol consumption per capita ( $\geq 15$  years), was 4.4 litres (Table 1).<sup>5</sup>

## Raised blood pressure and cholesterol

In 2015, about 28% of men and women had raised blood pressure (BP) (systolic BP  $\geq 140$  mmHg or diastolic BP  $\geq 90$  mmHg) levels, which is higher than the GHO level of

22.1% and that of Africa's 27.4%.<sup>5</sup> In 2017, the percentage of DALYs lost because of hypertension was about 4.4%, while mortality caused by hypertensive heart disease was 1.64% matching that of 1.65% for global data (Table 1).<sup>4</sup> The estimated model using data from other countries and specific country characteristics for raised total cholesterol (TC  $\geq 5.0$  mmol/l) was 33.1% compared to GHO data (38.9%) in 2008.<sup>5</sup>

## Physical activity

Data for 11–17-year-old adolescents indicated that 87.4% were insufficiently active [ $< 60$  minutes of moderate- to vigorous-intensity physical activity (PA) daily].<sup>5</sup> The age-standardised estimate for adults who were insufficiently active ( $< 150$  minutes of moderate-intensity PA per week, or  $< 75$  minutes of vigorous-intensity PA per week) was 33.4% which is higher than GHO data at 27.5% (Table 1).<sup>5</sup>

Table 1. Cardiovascular disease indicators for Namibia

Indicators	Male	Female	Total	Year
<b>Status of national the CVD epidemic</b>				
Premature CVD mortality (30–70 years old) (% deaths)	-	-	12	2012
Total CVD mortality (% of deaths)	16.5	19.2	17.7 (31.8)*	2017
Total RHD mortality (% of deaths)	0.32	0.21	0.27 (0.5)*	2017
DALYs attributable to CVD (%)	7.1	6.2	6.7 (14.7)*	2017
AF and atrial flutter (%)	0.21	0.2	0.2 (0.5)*	2017
Prevalence of RHD (%)	0.84	1.03	0.94 (0.5)*	2017
<b>Tobacco and alcohol</b>				
Prevalence of adult tobacco use ( $\geq 15$ years old) (%)	38.9 (36.1)**	11.4 (6.8)**	-	2015
Prevalence of youth (13–15-year-olds) tobacco use (%)	31.9 (18.2)**	29.9 (8.3)**	-	2008
Estimated direct (healthcare related) cost of tobacco use in your population (current US\$)	-	-	-	-
Proportion of premature CVD mortality attributable to tobacco (%)	-	-	4 (10)**	2004
Recorded alcohol consumption per capita ( $\geq 15$ years old) (litres of pure alcohol) (three-year average)	-	-	4.4	2016–18
<b>Raised blood pressure and cholesterol</b>				
Population with raised BP (SBP $\geq 140$ mmHg or DBP $\geq 90$ mmHg) (%)	28.2 (24.1)**	28.4 (20.1)**	-	2018
Population with raised TC ( $\geq 5.0$ mmol/l) (%)	31.1	34.5	33.1 (38.9)**	2008
DALYs attributable to hypertension (%)	4.7	4.0	4.4 (8.7)*	2017
Mortality caused by hypertensive heart disease (% of deaths)	1.12	2.31	1.64 (1.7)*	2017
<b>Physical activity</b>				
Adolescents (11–17 years old) who are insufficiently active ( $< 60$ minutes of moderate- to vigorous-intensity PA daily) (%)	86.5	88.4	87.4	2016
Adults (age-standardised estimate) who are insufficiently active ( $< 150$ minutes of moderate-intensity PA per week, or $< 75$ minutes of vigorous-intensity PA per week) (%)	28.9	37.4	33.4 (27.5)**	2016
<b>Overweight and obesity</b>				
Adults who are overweight (BMI $\geq 25$ – $< 30$ kg/m <sup>2</sup> ) (%)	27.2	51.9	40.6 (38.9)**	2016
Prevalence of obesity (BMI $\geq 30$ kg/m <sup>2</sup> ) (%)	7.5	25.4	17.2 (13.1)**	2016
<b>Diabetes</b>				
Defined population with fasting glucose $\geq 126$ mg/dl (7.0 mmol/l) or on medication for raised blood glucose (age-standardised) (%)	7.3 (9)**	7.5 (8)**	-	2014
Prevalence of diabetes (20–79 years old) (%)	-	-	4.5 (9.3) <sup>†</sup>	2019

CVD, cardiovascular disease; RHD, rheumatic heart disease; DALYs, disability-adjusted life years; AF, Atrial fibrillation; SBP, systolic blood pressure; DBP, diastolic blood pressure; TC, total cholesterol; PA, physical activity; BMI, body mass index.

\*IHME Global data exchange<sup>4</sup>

\*\*WHO Global data<sup>5</sup>

<sup>†</sup>IDF Diabetes Atlas.<sup>8</sup>

## Overweight and obesity

In 2016, the prevalence of overweight [body mass index (BMI)  $\geq 25$ – $< 30$  kg/m<sup>2</sup>] and obesity (BMI  $\geq 30$  kg/m<sup>2</sup>) in adults 25 years and older was 40.6 and 17.2%, respectively.<sup>5</sup> Compared to global data, both these indicators are much higher than that of 38.9% for overweight and 13.1% for obesity (Table 1).<sup>5</sup> Similarly to most African countries, far more women were overweight or obese compared to men (51.9 and 25.4% vs 27.2 and 7.5%, respectively).

## Diabetes

The percentage of the population defined with a fasting glucose level  $\geq 7.0$  mmol/l or on medication for raised blood glucose (age-standardised) in 2014 was 7.3% for men and 7.5% for women. In 2019, the age-adjusted prevalence (20–79 years) of diabetes was 4.5%, which is higher than that of Africa (3.9%) but lower than the global level of 9.3% (Table 1).<sup>8</sup>

## Part C: Clinical practice and guidelines

### Health system capacity

In 2018, the country had an average of 4.2 physicians and 19.54 nurses, and in 2009, 27 hospital beds per 10 000 of the population.<sup>5</sup> In 2009, the first medical school opened.

Before 2008 there was no specialised adult or paediatric cardiology or cardiothoracic service in Namibia. Patients with heart disease were treated by local paediatricians and physicians, then referred to cardiac centres in other African countries for interventions or surgeries. In 2008, the WCH complex, the tertiary public hospital in the capital, inaugurated the Cardiac Unit; the first facility in Namibia to provide comprehensive cardiac care and surgery to children and adults with a particular focus on RHD. Three other centres have subsequently been set up in the private sector (two in Windhoek and one in northern Namibia) that have supported the state Cardiac Unit. At present, specialised paediatric and congenital cardiac services and cardiac surgery are available in the private and public sector. In the public sector, adult cardiology care is provided by consultant physicians, and specialised interventions are arranged on an *ad hoc* basis with private cardiologists.

Although the state system initially focused on specialised tertiary cardiovascular care, the Ministry of Health and Social Services (MoHSS), with the support of partners, established initiatives and programmes to address the national cardiovascular health needs, therefore, moving from a strictly vertical (tertiary cardiovascular centres) or horizontal (health system strengthening through improved primary healthcare) response to a more diagonal one (strengthening primary healthcare and infrastructure alongside disease-specific activities).

Currently, regarding comprehensive services in the state sector, there is a clinical, interventional and surgical paediatric and congenital heart disease service. A team of super-specialists, nurses, technologists, perfusionists, medical officers and social workers is actively involved in clinical management and research. The adult cardiology services until

recently enjoyed similar successes but without a full-time cardiologist, interventional procedures have been *ad hoc*.<sup>9</sup>

Reasons for slow progress include lack of, or no access to, data for locally relevant clinical tools to assess CVD risk or the management of RHD. Also, no system was found to measure the quality of care provided to people who have suffered acute cardiac events. No national CVD database exists, however, there is a hospital-based cardiothoracic surgical database, and cardiologists have complete datasets regarding CVD care provided to their patients over the past eight years (SIB, pers commun).

There is an RHD hospital-based registry, which made it feasible for Namibia to participate in the REMEDY study, a contemporary, multi-centre study and RHD GEN. Network.<sup>10</sup> There are also locally relevant clinical guidelines for the management of pharyngitis and rheumatic fever, and detection and management of AF are available.<sup>11</sup> No local guidelines for the management of adult CVD are available, however the American Heart Association and the European Society of Cardiology guidelines are followed.<sup>12</sup> The same applies to a national programme for adult CVD prevention, with local physicians also following international recommendations (SIB, pers commun). Although no national guidelines for the treatment of tobacco dependence exist, health education and advice to quit the habit are provided in the Standard Treatment Guidelines.<sup>11</sup> Namibia has standard treatment guidelines for diabetes mellitus and other NCD or conditions, such as hypertension.<sup>11</sup>

### Essential medicines and interventions

Only aspirin, angiotension converting enzyme (ACE) inhibitors and  $\beta$ -blockers could be made available at health centres and clinics for follow-up treatment.<sup>13</sup> In 2019, metformin, insulin and statins were also said to be available in the public sector, yet these sectors have been suffering from underfinancing, resulting in essential drugs to be unavailable at public health pharmacies.<sup>5</sup> Warfarin and clopidogrel are also not available at the public health level.<sup>11,13</sup> Data regarding priority CVD risk stratification or secondary prevention of acute rheumatic fever (ARF) and RHD at primary healthcare facilities were not available. However, TC measurement was available at the primary healthcare level.<sup>5</sup>

### Secondary prevention and management

The percentage of persons with hypertension receiving medical treatment is 17%,<sup>14</sup> with no data available for high-risk patients with AF receiving oral anticoagulants. Those people with a history of CVD taking aspirin, statin and at least one antihypertensive agent is also unknown. The percentage of patients with RHD receiving penicillin for secondary prophylaxis is low (33%) and the result of a combination of non-prescription, poor adherence and disruption in the supply chain (Namibia REMEDY data, unpublished).

## Part D: Cardiovascular disease governance


Strategies focusing on assessing and reducing the burden of NCD, which include CVD and risk factors, such as diabetes,

**NAMIBIA – JULY 2020**

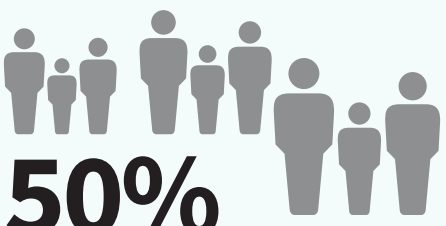
**Status of Cardiovascular Disease (CVD) and Non-communicable diseases (NCD)**

**Country Demographics**

**World Bank Classification**  
**Upper-middle income**




**50%**  
of population living in rural areas  
60% (Sub-Sahara Africa)





**NAMIBIA**

**0.27%**  
of total mortality caused by **RHD**  
Global data: 0.51%



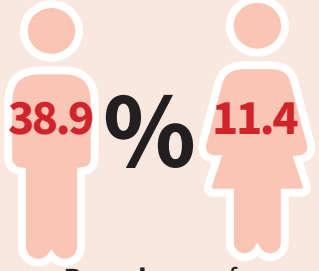
**0.94%**  
Prevalence of **rheumatic heart disease (RHD)**  
Global data: 0.53%




**4%**  
of premature CVD mortality attributable to **tobacco**  
Global data: 10%



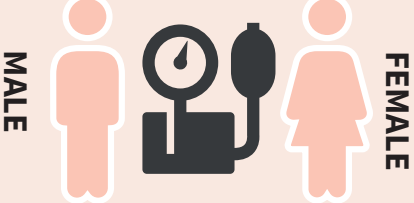
**38.9%** MALE **11.4%** FEMALE  
Prevalence of **tobacco use age ≥15**  
Global data: 36.1% (male) 6.8% (female)



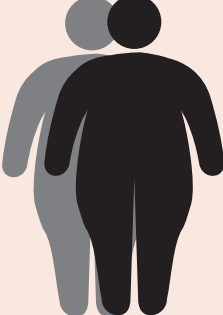
**1.64%**  
of deaths caused by **hypertensive heart disease**  
Global data: 1.65%



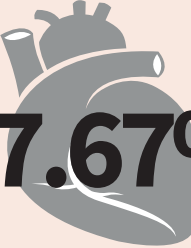
**28.2%** MALE **28.4%** FEMALE  
of population with raised **blood pressure** (SBP ≥140 or DBP ≥90)  
Global data: 24.1% (male) 20.1% (female)




**17.2%**  
Prevalence of obese adults (BMI of ≥30 kg/m<sup>2</sup>)  
Global data: 13.1%



**17.67%**  
of deaths caused by CVD  
Global data: 31.8%



**33.1%**  
of population with raised total **cholesterol** (≥5.0 mmol/L)  
Global data: 38.9%



**4.5%**  
Prevalence of diabetes (ages 20-79)  
3.9% (Africa)







**NAMIBIA**

**Health System Capacity**



**4.2**

Number of physicians (per 10,000 population)



**19.54**

Number of nurses (per 10,000 population)



**27**

Number of hospital beds (per 10,000 population)

**KEY:**

No data



Not in place



In process/ partially implemented



In place



**Clinical Practice and Guidelines**

Locally-relevant (national or subnational level):

Clinical tool to assess CVD risk .....

Guidelines for treatment of tobacco dependence .....

**Clinical Guidelines for:**

The detection and management of atrial fibrillation .....

The detection and management of acute rheumatic fever .....

The detection and management of rheumatic heart disease .....

The detection and management of diabetes .....

CVD prevention (within the last 5 years) .....

A system to measure the quality of care provided to people who have suffered acute cardiac events .....

NAMIBIA

**Cardiovascular Disease Governance**

**A national strategy or plan that addresses:**

CVDs and their specific risk factors .....

NCD and their risk factors .....

Rheumatic heart disease prevention and control as a priority .....

A national surveillance system that includes CVDs and their risk factors .....

**Stakeholder action**

Non-governmental organizations' advocacy for CVD policies and programmes .....

Civil society involved in developing and implementing of national CVD prevention and control plan .....

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have been developed, with a unit in the MoHSS responsible for these diseases or conditions.<sup>15</sup> However, no dedicated budget is available to ensure its implementation. Although a prevention and control strategy for RHD has been introduced, and a national advisory committee established, progress has been slow.<sup>16,17</sup> A national surveillance programme, the Demographic and Health Survey, has been reported but with very little information on CVD. The warfarin education/surveillance programme is ongoing and has reported successes (SF, pers commun). Windhoek Central Hospital is the only public health facility in Namibia with a warfarin clinic.<sup>18</sup>

Namibia follows the WHO best-buy policies regarding tobacco use and has formulated a national tobacco control plan and multi-sectoral co-ordination mechanism for tobacco control.<sup>16</sup>

The Ministries of Health and Education, along with other organisations, implemented the Health Promoting Schools Initiative, which has successfully improved the health of all people from the school environment.<sup>19</sup> In Namibia, CVD consumed the largest proportion of total spending on NCD, which was 22% in the 2015/16 and 18% in the 2016/17 fiscal years.<sup>20</sup>

Namibia was part of the WHO-CHOICE project, which incorporated a cost-effectiveness modelling tool that gathers national data to be used for developing the most effective interventions for leading causes of disease burden. The model can be adjusted according to the specific needs of the country and assist policymakers in planning and prioritising services at a national level.<sup>21</sup>

### Assessment of policy response

Legislation mandating health financing for CVD/NCD has been recommended as the government is aware that CVD costs can be high and consume a large portion of a country's health expenditure.<sup>22</sup> In the Namibian Essential Medicines list of the MoHSS, essential CVD medicines on the list have to be purchased from suppliers at the lowest possible prices and provided at affordable costs.<sup>13</sup> However, medicine is heavily commercialised and the government spends more than R100 million outsourcing services from the private sector, downplaying services that ought to serve masses (FS, pers commun).

The country has policies that ensure equitable nationwide access to healthcare professionals and facilities<sup>23</sup> but none that address the screening of high-risk CVD individuals. Yet no judicial orders protecting patients' rights and mandating improved CVD interventions, facilities, health-system procedures or resources have been implemented. A few policies do address individual interventions, such as tobacco and alcohol use, and PA.<sup>16</sup>

Since October 2011, Namibia has not yet submitted another framework convention on tobacco control (FCTC) report.<sup>24</sup> At that time the country reported having banned smoking in all public places including indoor workplaces and all forms of tobacco advertising, through the policy. Clear and visible warnings according to requirements and measures to protect tobacco control policies from tobacco industry interference were also mandated.<sup>17</sup> No sustainable funding is available for CVD from taxation of tobacco

or other sin products, and also no excise tax of the final consumer price of tobacco products in Namibia.

There are no taxes on unhealthy foods or sugar-sweetened beverages. Although no information was found for the percentage of excise tax of the final consumer price of alcohol products, excise taxes were increased from 22 February 2018 on ciders, alcoholic fruit beverages, malt beer and sparkling wine by 10%, unfortified wine and spirits by 8.5% and fortified wine by 6.0%. These alcoholic beverages are classified under 'sin' taxes. An additional 5% national 'sin' tax on alcohol and tobacco products will also be introduced for national revenue purposes.<sup>25</sup>

Legislation exists on banning the marketing of unhealthy foods to minors<sup>26</sup> but none mandating clear and noticeable warnings on foods that are high in calories, sugar or saturated fats. Namibia developed a food and nutrition policy to improve food and nutrition,<sup>16</sup> as well as one that addressed physical inactivity through mass media awareness.<sup>27</sup>

### Stakeholder action

In Namibia, non-governmental organisation (NGO) advocacy for CVD policies and programmes as such has not been demonstrated. However, NGO involvement through NCD and related risk factors has indirectly been reported.<sup>16</sup> Although no involvement of patients' organisations in the advocacy for CVD/NCD prevention and management has been reported, there is a patient-led ambassador/advocacy group Namibia for rheumatic fever and RHD.<sup>28</sup>

Involvement of civil society organisations (CSO) in the development and implementation of a national tobacco control plan and CVD prevention and control plan was also reported in the FCTC report.<sup>24,29</sup> No CSO involvement in the national multi-sectoral co-ordination mechanism for NCD/CVD was documented. No specific activities by cardiology professional associations were reported that aim at a 25% reduction in premature CVD mortality by 2025, although Namibia was represented at the 65th World Health Assembly in 2012.<sup>30</sup> Hypertension screening by businesses at workplaces have been addressed.<sup>31</sup>

As part of the data collected for Namibia, the following strengths, threats, weaknesses and priorities are summarised.

### Strengths

Namibia has a strong political will, with legislation and policies such as the FCTC in place. The MoHSS supported the training of several Namibian doctors and allied staff in cardiovascular care. At the World Health Assembly in 2018, Namibia endorsed the adoption of the Resolution on Rheumatic Fever and Rheumatic Heart Disease.<sup>32</sup> Implementation of programmes in response to the NCD disease burden is being addressed through innovative interventions, and there is good infrastructure. Central and regional medical stores are also available to ensure the availability of safe and efficacious medicines. However, many essential drugs are still not available in government pharmacies.<sup>16</sup>

A patient-driven awareness campaign, the Namibian RHD Ambassador programme, aims to empower people with

rheumatic fever and RHD through educational skills they can pass on to their families and communities about the disease. Furthermore, it also provides a platform for them to advocate for their health needs. This programme is receiving continued support from the MoHSS via the NCD desk.<sup>28</sup> However, there is still room for increased awareness about ARF/RHD at the community level.

Namibia's recorded alcohol consumption per capita (4.4 litres) is lower than that of countries such as Uganda (12.2 litres) and Nigeria (7.8 litres) or Tanzania and Rwanda (7.3 and 7.0 litres, respectively) in persons  $\geq$  15 years old.<sup>5</sup> Also, policies that address the harmful use of tobacco products, alcohol, unhealthy diets and other CVD risk factors such as physical inactivity and obesity are in place.<sup>16</sup>

In 2011, the MoHSS published Namibia's Standard Treatment Guidelines, which included, among other things, the detection and management of diabetes mellitus, rheumatic fever and RHD.<sup>11</sup>

### Threats

NCD are becoming unforeseen health issues, along with unhealthy lifestyles competing with the high burden of communicable diseases.<sup>15</sup> Namibia faces enormous threats for the funding base of the WHO country office, resulting from a global financial crisis and recession and reduction in donor funds.<sup>15</sup>

Namibia's total CVD mortality rate (17.7%) is higher than most other countries under investigation, including that of its neighbouring country, South Africa, at 16.1%. The total RHD mortality rate also ranks higher than most of the countries in our study. The prevalence of tobacco use in Namibia is also of concern when compared to the global prevalence of 36.1 and 6.8% for men and women, respectively. Similarly, adolescents' tobacco use is much higher than the global figures shown in Table 1. Other risk factors creating a reason for concern are hypertension, hypercholesterolaemia, overweight and obesity, also shown in Table 1. Hypertension prevalence of almost 46% in adults 35–64 years old, who participated in the 2013 Namibia Demographic and Health Survey, is high and reason for concern along with other NCD risk factors.<sup>33</sup>

Some CVD, such as RHD, show a female preponderance and affect women of childbearing age. Therefore comprehensive reproductive health services must be made available to these women, as pregnancy is associated with specific maternal and foetal morbidity and mortality. Access to information regarding their risk in pregnancy, medication use, family planning, and a safe, reliable form of contraception is essential. In addition to barrier methods, progesterone implants are a safe contraception option for women with CVD. Unfortunately, the local supply of these has been erratic. Long-term, children under 10 years old who receive mechanical prostheses do not fare well with anticoagulation like their adult counterparts. Repair, if feasible, is favoured under the circumstances.<sup>34</sup>

### Weaknesses

Morbidity and mortality caused by NCD are on the increase. The lack of funding caused some objectives not

to be met regarding NCD, such as the establishment of a CVD budget.<sup>15</sup>

Although the prevalence of RHD is below 1%, it is still higher than the global figure of 0.53% shown in Table 1. The incidence of new ARF cases reflects the reality that primary prevention is not practised broadly. Equally, the availability of benzathine penicillin for secondary prevention is not always guaranteed. Lately, benzathine penicillin has been reserved mostly for children under 15 years old, while the population beyond receives penicillin V potassium (Pen VK). A penicillin task force was set up to investigate and address the fragile supply chain.<sup>17</sup>

Although cardiac surgery is available locally, the waiting lists and times are long. As patients sometimes present with advanced disease, they may miss the window of opportunity for curative or palliative surgery or die while waiting.<sup>34,35</sup> Cardiac interventions and surgeries are generally available in the private sector, with limited access to adults in the public health sector in the light of budget and skills restrictions.<sup>9</sup> Similar to African countries, Namibia has a shortage of human resources and local expertise.<sup>9</sup>

### Priorities

Priority areas for prevention and control are to:

- strengthen surveillance, monitoring and research to establish disease patterns and trends
- influence policy formulation, legislation and support planning for NCD and conditions
- promote healthy lifestyles and primary prevention.<sup>15</sup>

According to the WHO Country Cooperation Strategy 2010–2015, transparent policy and strategy need to be defined, and funds allocated to address the agenda through sound partnerships with all relevant stakeholders.<sup>15</sup> Therefore, it is imperative to implement a well-organised and controlled public–private partnership as a priority to secure appropriate care for CVD patients at the public healthcare level.

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# Nigeria Country Report

## PASCAR and WHF Cardiovascular Diseases Scorecard project

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### Abstract

Data collected for the World Heart Federation's Scorecard project regarding the current state of cardiovascular disease prevention, control and management, along with related non-communicable diseases in Nigeria are presented. Furthermore, the strengths, threats, weaknesses and priorities identified from these data are highlighted in concurrence with related sections in the attached infographic. Information was collected using open-source datasets available online and other relevant government publications.

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On behalf of the World Heart Federation (WHF), the Pan-African Society of Cardiology (PASCAR) co-ordinated data collection and reporting for the country-level Cardiovascular Diseases Scorecard to be used in Africa.<sup>1,2</sup> The Nigerian Cardiac Society, along with the PASCAR assistant secretary

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general – western region, assisted the team in collating and verifying data for Nigeria as one of the participating countries. The Non-Communicable Disease Control Division of the Federal Ministry of Health in Abuja, Nigeria also contributed. Dedicated assistance during the data-collection phase was provided by a Nigerian student at Gettysburg College in Gettysburg, Pennsylvania, USA.

Based on the data collected, we summarise the strengths, threats, weaknesses and priorities identified, which need to be considered in conjunction with the associated sections provided in the infographic published with this report. Datasets used included open-source data from the World Bank, the World Health Organization (WHO), Institute for Health Metrics and Evaluation, the International Diabetes Federation, Nigeria's Federal Ministry of Health, Abuja, Nigeria, and other government publications.

### Part A: Demographics

According to the World Bank (2018), Nigeria is a lower-middle-income country with 50% of its people living in rural areas.<sup>3</sup> In 2009, 53.5% of the population was living below the US\$1.9-a-day ratio, with most recent data indicating little change projected at 50%.<sup>4</sup> Life expectancy at birth in 2018, was 53 and 55 years for men and women, respectively. The general government health expenditure was 0.53% of the gross domestic product (GDP) in 2017, while the country GDP per capita was US\$2028.2 in 2018.<sup>5</sup>

### Part B: National cardiovascular disease epidemic The national burden of cardiovascular disease (CVD) and non-communicable diseases (NCD) risk factors

The overall probability of dying between the ages of 30 and 70 years from the major NCD in Nigeria was 22% in 2016.<sup>6</sup> However, the risk of premature deaths attributable to CVD (age 30–70 years) in 2012 was similar to its neighbouring country, Cameroon at 12%.<sup>7</sup> In 2017, the age-standardised total CVD death rate was 7.73%, which is the lowest of all African countries included in this project.<sup>8</sup> The percentage of disability-adjusted life years (DALYs) resulting from CVD for men was about 2.5%, and 2.8% for women. The prevalence of atrial fibrillation (AF) and atrial flutter was 0.13%, while that of rheumatic heart disease (RHD) was 0.75%. The total RHD mortality rate was 0.11% of all deaths (Table 1).<sup>8</sup>

### Tobacco and alcohol

The prevalence of tobacco use in adult men and women ( $\geq 15$  years old) was 11 and 1%, respectively, in 2016.<sup>6</sup> Data available for 13-15-year-olds indicated that 18.6% of these adolescents used tobacco.<sup>9</sup> In the Global Youth Tobacco Survey, similar results were described in an earlier report.<sup>10,11</sup> Tobacco was estimated to kill over 16 100 persons annually.<sup>12</sup> The estimated annual direct cost of tobacco use in Nigeria is not known, while the premature CVD mortality rate attributable to tobacco is 2% of that of the total death rate (Table 1).<sup>13</sup> The three-year (2016–18) average recorded alcohol consumption per capita ( $\geq 15$  years) was 7.8 litres (Table 1).<sup>5</sup>

### Raised blood pressure and cholesterol

In 2015, the percentage of men and women with raised blood pressure (BP) (systolic BP  $\geq 140$  mmHg or diastolic BP  $\geq 90$  mmHg) was 22.7 and 25%, respectively.<sup>5</sup> Country data for raised total cholesterol level ( $\geq 5.0$  mmol/l) in

2008 was 16.8%.<sup>5</sup> The percentage of DALYs lost because of hypertension was 1.6%, whereas mortality rate caused by hypertensive heart disease was 0.36% in 2017, which is much lower than the global figure of 1.65% (Table 1).<sup>8</sup>

### Physical activity

In a study among adolescents, 62.6% were found to be insufficiently active [ $< 60$  minutes of moderate- to vigorous-intensity physical activity (PA) daily].<sup>14</sup> In 2016, the age-standardised estimate for adults who were insufficiently active ( $< 150$  minutes of moderate-intensity PA per week or  $< 75$  minutes of vigorous-intensity PA per week) was 27.1%. This figure corresponds to that of the global data at 27.5% (Table 1).<sup>5</sup>

### Overweight and obesity

In adults 25 years and older, the prevalence of overweight [body mass index (BMI)  $\geq 25$ – $< 30$  kg/m<sup>2</sup>] and obesity (BMI  $\geq 30$  kg/m<sup>2</sup>) was 28.9 and 8.9%, respectively in 2016 (Table 1).<sup>5</sup>

Table 1: Cardiovascular disease indicators for Nigeria

Indicators	Male	Female	Total	Year
<b>Status of the national CVD epidemic</b>				
Premature CVD mortality (30–70 years old) (% deaths)	-	-	12	2012
Total CVD mortality (% of deaths)	7.05	8.51	7.73 (31.8)*	2017
Total RHD mortality (% of deaths)	0.1	0.13	0.11 (0.5)*	2017
DALYs attributable to CVD (%)	2.47	2.78	2.61 (14.7)*	2017
AF and atrial flutter (%)	0.15	0.11	0.13 (0.5)*	2017
Prevalence of RHD (%)	0.66	0.83	0.75 (0.5)*	2017
<b>Tobacco and alcohol</b>				
Prevalence of adult tobacco use ( $\geq 15$ years old) (%)	11.0 (36.1)**	1.0 (6.8)**	-	2016
Prevalence of youth (13-15-year-olds) tobacco use (%)	-	-	-	2016
Estimated direct (healthcare-related) cost of tobacco use in your population (current US\$)	-	-	-	2018
Proportion of premature CVD mortality attributable to tobacco (%)	-	-	2 (10)**	2004
Recorded alcohol consumption per capita ( $\geq 15$ years old) (litres of pure alcohol) (three-year average)	-	-	7.8	2016–18
<b>Raised blood pressure and cholesterol</b>				
Population with raised blood pressure (SBP $\geq 140$ mmHg or DBP $\geq 90$ mmHg) (%)	22.7 (24.1)**	25.0 (20.1)**	-	2015
Population with raised total cholesterol ( $\geq 5.0$ mmol/l) (%)	14.0	19.4	16.8 (38.9)**	2008
DALYs attributable to hypertension (%)	1.5	1.73	1.61 (8.7)*	2017
Mortality caused by hypertensive heart disease (% of deaths)	0.18	0.56	0.36 (1.7)*	2017
<b>Physical activity</b>				
Adolescents (11–17 years old) who are insufficiently active ( $< 60$ minutes of moderate- to vigorous-intensity PA daily) (%)	-	-	62.2 (80.7)**	2016
Adults (age-standardised estimate) who are insufficiently active ( $< 150$ minutes of moderate-intensity PA per week, or $< 75$ minutes of vigorous-intensity PA per week) (%)	24.7	29.6	27.1 (27.5)**	2016
<b>Overweight and obesity</b>				
Adults who are overweight (BMI $\geq 25$ – $< 30$ kg/m <sup>2</sup> ) (%)	21.7	36.1	28.9 (38.9)**	2016
Prevalence of obesity (BMI $\geq 30$ kg/m <sup>2</sup> ) (%)	4.6	13.1	8.9 (13.1)**	2016
<b>Diabetes</b>				
Defined population with fasting glucose $\geq 126$ mg/dl (7.0 mmol/l) or on medication for raised blood glucose (age-standardised) (%)	6.3 (9)*	6.0 (8)*	-	2014
Prevalence of diabetes (20–79 years old) (%)	-	-	3.1 (9.3) <sup>†</sup>	2019

CVD, cardiovascular disease; RHD, rheumatic heart disease; DALYs, disability-adjusted life years; AF, atrial fibrillation; SBP, systolic blood pressure; DBP, diastolic blood pressure; PA, physical activity; BMI, body mass index.

\*IHME Global Health Data Exchange<sup>5</sup>

\*\*WHO Global data<sup>5</sup>

<sup>†</sup>IDF Diabetes Atlas.<sup>15</sup>

More women were respectively overweight or obese (36.1, 13.1%) than men (21.7, 4.6%).

### Diabetes

The percentage of the population defined with a fasting glucose level  $\geq 7.0$  mmol/l or on medication for raised blood glucose (age-standardised) in 2014 was 6.3% for men and 6% for women.<sup>5</sup> In 2019, the prevalence of age-adjusted (adults 20–79 years) diabetes was 3.1%,<sup>15</sup> which is lower than the 4% documented for 2014<sup>6</sup> or the global prevalence of 9.3% (Table 1).<sup>15</sup>

## Part C: Clinical practice and guidelines

### Health system capacity

The country had an average of 3.8 physicians and 11.8 nurses per 10 000 of the population in 2013 and 2018, respectively. The number of hospital beds per 10 000 people was five in 2008.<sup>5</sup>

In 2013, Nigeria had partially developed a locally relevant clinical tool to assess CVD risk along with guidelines for its prevention.<sup>16</sup> Through efforts by the Nigerian Cardiac Society task force on Rheumatic Heart Disease, locally relevant clinical guidelines on the management of pharyngitis, acute rheumatic fever (ARF) and RHD have also been partially implemented. However, no guidelines for the detection and management of AF or the treatment of tobacco dependence are available.

Nigeria participated in the REMEDY study, a prospective, international, multi-centre, hospital-based registry that provides all-inclusive up-to-date data on patients with RHD and will assist in developing preventative and management strategies.<sup>17</sup> In a prospective registry, the RE-LY AF (Randomized Evaluation of Long-Term Anticoagulation Therapy), Nigeria provided significant data as part of the African leg that enrolled 1 137 patients presenting to emergency units with AF.<sup>18</sup> RHD was present in 21.5% of participants from the nine African countries.<sup>18</sup> The country is also part of the INVICTUS trial (INVESTigation of rheumatic AF Treatment Using vitamin K antagonists, rivaroxaban or aspirin Studies), which is a clinical trial investigating the safety and efficacy novel oral anticoagulants.<sup>19,20</sup> A system to measure the quality of care provided to people who have suffered acute cardiac events has not been implemented. However, diabetes guidelines were introduced by the Diabetes Association of Nigeria in 2013.<sup>21</sup>

### Essential medicines and interventions

Although the Essential Medicine List includes at least seven of the eight essential CVD/NCD medicines, not all of these are available at the primary healthcare level.<sup>22</sup> In 2019, only aspirin was available at primary care facilities in the public health sector.<sup>5</sup> No data were available for CVD risk stratification in primary healthcare facilities, total cholesterol measurement or secondary prevention of ARF and RHD in public sector health facilities.<sup>5</sup>

### Secondary prevention and management

In 2011, 23.07% of high-risk patients with AF were on oral anticoagulant treatment.<sup>23</sup> Through a global initiative of the

International Society of Hypertension in 2017, 12.9% of people were receiving treatment for high blood pressure.<sup>24</sup> However, no data are available on people with a history of CVD taking aspirin, statin and at least one antihypertensive agent.

## Part D: Cardiovascular disease governance

In 2019, Nigeria launched its first national multi-sectoral action plan (NMSAP) for the prevention and control of NCD, 2019–2025, with targets and a roadmap for its implementation.<sup>25</sup> As an immediate gain, a specialised package for essential NCD intervention as well as national hypertension treatment protocol was developed for implementation at the primary healthcare level.<sup>26</sup> The NMSAP will address CVD and the risk factors through Nigeria's Federal Ministry of Health (FMOH) in partnership with other key stakeholders, such as the National Primary Healthcare Development Agency.<sup>25</sup> The budget allocation for such implementation was previously reported to be less than the 15% minimum recommended by the WHO, possibly because of the recession, among other factors.<sup>27</sup> A focal unit has been identified at the Federal and State Ministry of Health that is responsible for implementing and controlling NCD and the associated risk factors.<sup>16,28</sup>

According to the National Policy and Strategic Plan of 2013, RHD prevention and control is being addressed as a priority.<sup>16</sup> Furthermore, a national surveillance and monitoring system has been implemented that includes CVD and their risk factors, in conjunction with relevant agencies/organisations.<sup>29,30</sup> Various organisations advocated for the enactment of the Tobacco Control Act, which was passed in 2015.<sup>28,31</sup>

Collaborative CVD intervention projects have been implemented between the Ministry of Health and non-health ministries, such as the Federal and States Ministries of Education and Information,<sup>32</sup> and other stakeholders.<sup>25</sup> The percentage of total annual government expenditure on cardiovascular healthcare is unknown. In 2003, Hutubessy *et al.* reported data for Nigeria, whereby the benefits of CVD prevention and control for population health and the economy had been modelled.<sup>33</sup>

### Assessment of policy response

Legislation was recently signed as part of the National Health Bill mandating health financing and essential medicines at affordable prices for CVD. The bill was named, Senate Bill 278, with the title, National Health Insurance Act, 2003 (Repeal and Re-enactment) Bill 2019.<sup>34</sup>

The following legislation and policies regarding tobacco control<sup>35,36</sup> are in use:


- banning of smoking in all public places (indoor and outdoor) including public transport
- clear and visible text warnings on at least half of the principal display areas of tobacco packs. Implementation of text and graphic health warnings were reported in 2014
- banning all forms of tobacco advertising, promotion and sponsorship
- gradual raising of excise tax on tobacco products
- measures to protect tobacco control policies from tobacco industry interference.

**NIGERIA – JULY 2020**

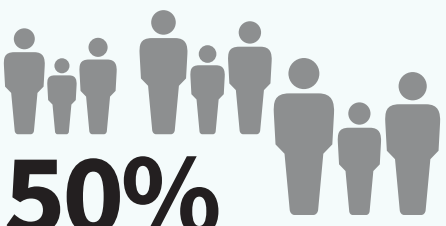
**Status of Cardiovascular Disease (CVD) and Non-communicable diseases (NCD)**

**Country Demographics**


**World Bank Classification**  
**Lower-middle income**




**50%**  
of population living in rural areas  
60% (Sub-Sahara Africa)




**0.11%**  
of total mortality caused by **RHD**  
Global data: 0.51%



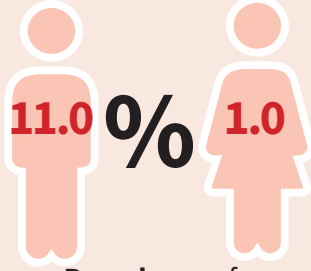
**0.75%**  
Prevalence of **rheumatic heart disease (RHD)**  
Global data: 0.53%




**2%**  
of premature CVD mortality attributable to **tobacco**  
Global data: 10%



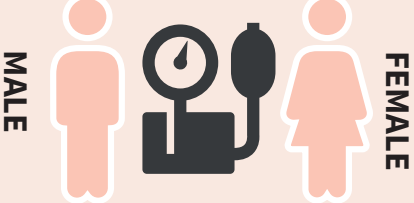
**11.0%** MALE **1.0%** FEMALE  
Prevalence of **tobacco use age ≥15**  
Global data: 36.1% (male) 6.8% (female)



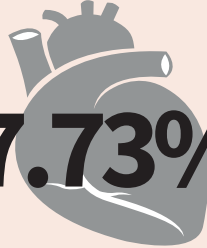
**0.36%**  
of deaths caused by **hypertensive heart disease**  
Global data: 1.65%




**22.7%** MALE **25%** FEMALE  
of population with raised **blood pressure** (SBP ≥140 or DBP ≥90)  
Global data: 24.1% (male) 20.1% (female)



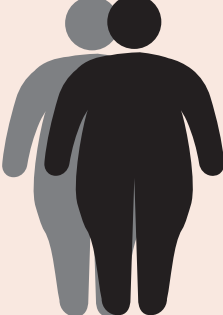
**7.73%**  
of **deaths** caused by CVD  
Global data: 31.8%



**16.8%**  
of population with raised total **cholesterol** (≥5.0 mmol/L)  
Global data: 38.9%



**8.9%**  
Prevalence of obese adults (BMI of ≥30 kg/m<sup>2</sup>)  
Global data: 13.1%



**3.1%**  
Prevalence of diabetes (ages 20-79)  
3.9% (Africa)



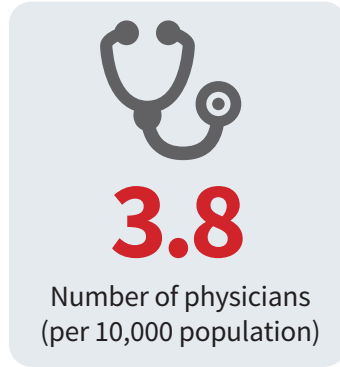
**NIGERIA**





**NIGERIA**

**Health System Capacity**



**KEY:** No data Not in place In process/ partially implemented In place

**Clinical Practice and Guidelines**

Locally-relevant (national or subnational level):

Clinical tool to assess CVD risk .....

Guidelines for treatment of tobacco dependence .....

**Clinical Guidelines for:**

The detection and management of atrial fibrillation .....

The detection and management of acute rheumatic fever .....

The detection and management of rheumatic heart disease .....

The detection and management of diabetes .....

CVD prevention (within the last 5 years) .....

A system to measure the quality of care provided to people who have suffered acute cardiac events .....

NIGERIA

**Cardiovascular Disease Governance**

**A national strategy or plan that addresses:**

CVDs and their specific risk factors .....

NCD and their risk factors .....

Rheumatic heart disease prevention and control as a priority .....

A national surveillance system that includes CVDs and their risk factors .....

**Stakeholder action**

Non-governmental organizations' advocacy for CVD policies and programmes .....

Civil society involved in developing and implementing of national CVD prevention and control plan .....

For more information, please email [info@worldheart.org](mailto:info@worldheart.org) [info@pascar.org](mailto:info@pascar.org) [secretary@nigeriancardiacsociety.org](mailto:secretary@nigeriancardiacsociety.org)

Source References: Global Health Data Exchange; WHO Global Health Observatory data repository; WHO NCD Document repository; Country specific publications.

Sustainable funding for CVD from 'sin' tax is not available. The percentage of excise tax of the final consumer price of tobacco products is 20.63%,<sup>35</sup> and 60% for alcohol products.<sup>37</sup> Although access to healthcare professionals and facilities,<sup>38</sup> and screening of individuals at high risk of CVD are available, there has not been any active follow up to ensure these services are implemented.<sup>39</sup>

Taxes on unhealthy foods or sugar-sweetened beverages have been instituted,<sup>5</sup> and a draft document was tabled banning the marketing of unhealthy foods to minors in 2018.<sup>40</sup> Legislation mandating clear and visible warnings on foods that are high in calories, sugar or saturated fats is functional.<sup>41</sup> Policy interventions that promote a diet to reduce CVD risk and facilitate PA have also been implemented.<sup>36</sup>

### Stakeholder action

In 2018, advocacy for CVD policies and programmes by non-government organisations (NGO) and those for CVD/NCD prevention and management through the active involvement of patients' organisations had been implemented.<sup>42</sup> Advocacy champions and patient engagement were reported for RHD in 2014.<sup>43</sup> Various civil societies were involved in the development and implementation of a national tobacco control plan<sup>35</sup> and a CVD prevention and control plan.<sup>44</sup> Civil society was also involved in the national multi-sectoral co-ordination mechanism for NCD/CVD.<sup>36</sup>

Nigeria is one of the few African countries that reported specific activities by cardiology professional associations, which aim at a 25% reduction in the premature CVD mortality rate by 2025.<sup>45</sup> Screening for medical conditions, including hypertension, was reported in a study in 2018.<sup>46</sup>

As part of the data gathered for Nigeria, the following strengths, weaknesses, threats and priorities are summarised.

### Strengths

The National Policy and NMSAP for the Prevention and Control of Non-Communicable Diseases were developed to ensure that policies are implemented that will prompt and guarantee a healthy lifestyle and quality health for all Nigerians.<sup>16,25</sup> As a member state of the WHO, Nigeria is a signatory to the resolution and conventions that were adopted at the World Health Assembly and other related NCD meetings.<sup>16</sup> The National Health Insurance Scheme (NHIS) was established to include all NCD and ensure that everybody has access to sound healthcare services.<sup>38</sup>

As part of the RE-LY AF, REMEDY and INVICTUS studies, Nigeria has clinical registers of people with a history of AF, rheumatic fever and RHD available.<sup>17-19</sup> The Nigerian Cardiac Society has completed registries on acute and chronic heart failure (HF), acute coronary syndromes and peripartum cardiomyopathy.<sup>47,48</sup> The country contributed over 40% of data towards the THESUS-HF (sub-Saharan African Survey of Heart Failure, a multi-centre African registry of acute HF) survey.<sup>49</sup> Nigeria, as one of five African countries, participated in the International Congestive Heart Failure study (INTER-CHF) and the ongoing global HF registry.<sup>50</sup> In another multi-centre, randomised, controlled trial of an influenza vaccine to reduce adverse vascular events (IVVE)

in patients with heart failure, Nigeria is actively participating and had enrolled 1 011 patients by January 2019.<sup>51</sup> A national surveillance system that includes CVD and their risk factors also exists.<sup>30</sup> Evidence of stakeholder involvement and advocacy in the prevention and management of NCD, CVD and related risk factors is very much present in Nigeria.<sup>42-44</sup>

According to the WHO Framework Convention on Tobacco Control (FCTC) report of 2018, there was no national tobacco control plan. A national tobacco control committee, with members from ministries, departments and agencies, was inaugurated on 12 July 2016 as part of a tobacco control co-ordination mechanism but this is yet to be extended to the state level.<sup>35</sup> The implementation for such a plan was recommended in 2012,<sup>32</sup> with civil society involved in the development and implementation of a national tobacco control plan.<sup>35</sup> Legislation, however, was reported for the banning of smoking in indoor workplaces and all public places, as well as all forms of tobacco advertising, promotion and sponsorship.<sup>35</sup> Legislation regarding clear and visible warnings on at least half of the principal display areas of tobacco packs and measures to protect tobacco control policies from tobacco industry interference was also mandated.<sup>35</sup> Furthermore, Nigeria rendered excise tax on the final consumer price of tobacco and alcohol products.<sup>37</sup> Legislation mandating health financing for CVD, along with providing essential CVD medicines at affordable prices, has recently been implemented as part of the National Health bill signed in 2019.<sup>34</sup>

### Threats

Along with globalisation, urbanisation and industrialisation, new lifestyles and risky behaviours have inflicted chronic diseases.<sup>16</sup> In Nigeria, CVD comprise the highest burden of NCD, with hypertension adding to cardiac failure and stroke. Therefore, one in four healthy Nigerians were at risk to develop coronary heart disease in 2010.<sup>39</sup> Alikor and Emem-Chioma<sup>52</sup> noted that a rising trend in the burden of CVD increased in the presence of clustering of risk factors, including socio-economic status in a rural population.

Along with diabetes, overweight and obesity, and a sedentary lifestyle, the resultant NCD are possibly the cause of the higher premature CVD mortality rate compared to most of the African countries in our project.<sup>38</sup> Nigeria's percentage of premature CVD mortality is similar to that of Namibia and its neighbouring country, Cameroon, at 12%, which is higher than most of the other African countries investigated.

Raised blood pressure among women (25%) is higher than the global figure of 20.1%, while that for men (22.7%) is just below the global 24.1%. Overweight and obesity tend to be a problem, as in most African countries, however, the prevalence in Nigeria is slightly lower than the global data of 38.9 and 13.1%, respectively (Table 1).

In 2014, Nigeria had a prevalence of 4% diabetes,<sup>6</sup> while in 2015, this was 2.8%, translating to 1:53 Nigerians suffering from diabetes.<sup>53</sup> However, in 2019 the IDF reported a 3.1% prevalence of diabetes.<sup>15</sup> By 2017, Nigeria had not yet conducted a WHO STEP survey, although the minister of health had envisaged planning one.<sup>53</sup> There is a rising trend in the cardiovascular disease burden in Nigeria, resulting from an increasing rural-urban migration and socio-economic

changes.<sup>52</sup> Furthermore, Nigeria is said to pose a threat to ending world poverty by 2030 and has overtaken India in having the poorest people in the world, which could affect people's health.<sup>54,55</sup>

### Weaknesses

No relevant data are available on the estimated direct cost (in current US\$) of tobacco use in the Nigerian population. Although there is a national Tobacco Control Act 2015, not all aspects have been implemented in Nigeria.<sup>32</sup> Various NGO played an active role in advocacy, however, a policy for the tobacco control plan took 10 years after approval of the FCTC before being passed because of constraints in funding and conflict of interest.

Most of the essential CVD medicines are not available in the public health sector, although they appear on the Essential Medicines List (EML).<sup>522</sup> In his foreword of the EML, the minister of health urged that essential medicines should be available to everyone throughout the country at all times as it expands its primary healthcare system.<sup>22</sup> Other services or interventions that are not widely used as a policy at public sector health facilities are CVD risk stratification, measurement of total cholesterol levels, and provisions for secondary prevention of rheumatic fever and RHD. These services, however, are available in many tertiary hospitals in the country. Efforts spearheaded by the Nigerian Cardiac Society task force on Rheumatic Heart Disease are in progress to implement locally relevant clinical guidelines for managing pharyngitis, ARF and RHD, however, no data are available regarding AF-related guidelines.

Although the availability, affordability and accessibility of healthcare along with sustainability were available, deficiencies were present in all of these aspects.<sup>38</sup>

No data regarding judicial orders protecting patients' rights and mandating improved CVD interventions, facilities, health system procedures or resources are available. The same applies to sustainable funding for CVD and taxes on unhealthy foods or sugar-sweetened beverages.

### Priorities

At a meeting held in Abuja, Nigeria in August 2017, it was recommended that government and other relevant organisations join hands to prevent and control NCD.<sup>53</sup> Funds should be increased for healthcare, and access to affordable and effective medicines ensured to meet the WHO recommendations. NCD risk factors, including a sedentary lifestyle, unhealthy diet, overweight, and tobacco and alcohol use should be addressed via legislation, health education and advocacy. Integration of prevention and control strategies for NCD should also be encouraged and intensified.<sup>53</sup>

At a consensus summit in 2016, researchers suggested Nigeria's FMOH should provide guidelines for acceptable dietary lipids along with commissioning research and a nationwide survey on NCD.<sup>30</sup>

Not all the tobacco control policies in Nigeria instil the principles of multi-sectoral actions or best-buy strategies in their formulation. Therefore, an urgent need exists to address these neglected areas that may hamper tobacco control efforts.<sup>31,32</sup>

To achieve the global target of a 25% reduction in premature death by 2025, the president of the Nigerian NCD Alliance, Dr Sunny F Kuku, said this would be challenging and recommended that prevention of NCD be targeted early. Therefore, awareness and management of NCD would need determined efforts to prevent these diseases and their risk factors effectively.<sup>45</sup>

This publication was reviewed by the PASCAR Governing Council and approved by the the Nigerian Cardiac Society.

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# Rwanda Country Report

## PASCAR and WHF Cardiovascular Diseases Scorecard project

Joseph Mucumbitsi, Wihan Scholtz, Oana Scarlatescu, George Nel, Jean M Fourie

### Abstract

Data collected for the World Heart Federation's Scorecard project regarding the current state of cardiovascular disease prevention, control and management along with related non-communicable diseases in Rwanda are presented. Furthermore, the strengths, threats, weaknesses and priorities identified from these data are highlighted in concurrence with related sections in the attached infographic. Information was collected using open-source datasets available online and relevant government publications.

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On behalf of the World Heart Federation (WHF), the Pan-African Society of Cardiology (PASCAR) co-ordinated data collection and reporting for the country-level Cardiovascular Diseases Scorecard for use in Africa.<sup>1,2</sup> The Rwanda Heart Foundation, with the assistance of its president and founder, helped in collecting and verifying the data for Rwanda, as one of the participating countries. In this report, we summarise Rwanda's strengths, threats, weaknesses and priorities identified from the collected data, along with needs to be considered in conjunction with the associated sections in the accompanying infographic. Datasets used included open-source data from the World Bank, the World Health Organization (WHO), Institute for Health Metrics and Evaluation, the International Diabetes Federation and government publications.

### Part A: Demographics

According to the World Bank (2018), Rwanda is a low-income country with 83% of its people living in rural areas.<sup>3</sup>

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In 2013, about 56% of the population were living below the US\$1.9-a-day ratio. Life expectancy at birth in 2018 was 67 years for men and 71 years for women.<sup>3</sup> The general government health expenditure in 2017 was 2.26% of the gross domestic product (GDP), while the country GDP per capita was US\$772.9 in 2018.<sup>4</sup>

### Part B: National cardiovascular disease epidemic The national burden of cardiovascular disease (CVD) and non-communicable diseases (NCD) risk factors

Rwanda's premature deaths attributable to CVD (30–70 years old) were similar to those of Uganda, Zambia and Sudan at 10% in 2012.<sup>1,5</sup> In 2017, the age-standardised total CVD death rate was 11.9%, which is slightly lower than the neighbouring country, Tanzania (12.9%). The percentage of disability-adjusted life years (DALYs) resulting from CVD was 4.1 and 5.1% for men and women, respectively. The percentage atrial fibrillation (AF) and atrial flutter was 0.12%, while that of rheumatic heart disease (RHD) was 1.0%. However, in 2013, 0.68% of school children, with a mean age of 12.2 years, were identified with RHD.<sup>6</sup> The total RHD mortality rate was 0.17% of all deaths in 2017 (Table 1).<sup>7</sup>

### Tobacco and alcohol

The prevalence of tobacco use in adult men and women ( $\geq 15$  years old) was 19.1 and 7.1%, respectively.<sup>8</sup> In the 13–15-year-old population, the prevalence was 13.3 and 9.5% in boys and girls, respectively, which is lower than most African countries in our sample for which we have data.<sup>9</sup> Data on the estimated annual direct cost of tobacco use are not available. The premature CVD mortality attributable to tobacco is 1% of the total mortality rate. The three-year (2016–18) average recorded alcohol consumption per capita ( $\geq 15$  years) was 7.0 litres (Table 1).<sup>4</sup>

### Raised blood pressure and cholesterol

In the national 2012–2013 non-communicable diseases STEP survey, 15.9% of the participants was identified with raised blood pressure (BP) (systolic BP  $\geq 140$  mmHg or diastolic BP  $\geq 90$  mmHg). Of these participants, 16.8% were men and 15% women, while the rate among the 55–64-year age group increased to almost 40%.<sup>8</sup> The percentage of DALYs lost because of hypertension was 2.81%, whereas mortality caused by hypertensive heart disease was 1.82%

in 2017.<sup>10</sup> For raised total cholesterol (TC,  $\geq 5.0$  mmol/l), the prevalence was 2.9% (Table 1), rising to 5.6% in men and 7.4% in women in the 55–64-year age groups.<sup>8</sup>

### Physical activity

Physical activity (PA) data from the NCD STEP survey showed that 61.5% of the 15–64-year-old population had high levels, 25.2% moderate and 13.3% low levels of PA.<sup>8</sup> No data are available for adolescents, ages 11–14 years old. The age-standardised estimate from the WHO Global Health Observatory (GHO) for adults who were insufficiently active ( $< 150$  minutes of moderate-intensity PA per week, or less than 75 minutes of vigorous-intensity PA per week) was 14.6% in 2016 (Table 1).<sup>4</sup>

### Overweight and obesity

Data from the Rwanda 2012–2013 NCD STEP survey showed that while 2.8% participants were obese, 14.3% were

overweight and 7.8% underweight. Of these participants, women were mostly obese (4.7%) and overweight (19%) compared to men (0.8 and 9.1%, respectively) (Table 1).<sup>8</sup> In 2016, the prevalence of overweight [body mass index (BMI)  $25 \text{ kg/m}^2$ ] and obesity (BMI  $\geq 30 \text{ kg/m}^2$ ) in adults 25 years and older was 25.1 and 5.8%, respectively, according to WHO GHO age-standardised estimates.<sup>4</sup> Far more women (33.5%) than men (15.6%) were overweight, with a similar pattern noticed regarding obese women and men (9.3% vs 1.9%, respectively).<sup>4</sup>

### Diabetes

The prevalence of raised blood sugar ( $\geq 6.1$  mmol/l) from the STEP survey was 3.1%,<sup>8</sup> while that of the population defined with a fasting glucose level  $\geq 7.0$  mmol/l or on medication (age-standardised), was 4.4% according to WHO GHO estimates.<sup>4</sup> In 2019, the prevalence of age-adjusted diabetes in adults 20–79 years was 5.1% (Table 1).<sup>11</sup>

Table 1: Cardiovascular disease indicators for Rwanda

Indicators	Male	Female	Total	Year
<b>Status of the national CVD epidemic</b>				
Premature CVD mortality (30–70 years old) (% deaths)	-	-	10	2012
Total CVD mortality (% of deaths)	9.6	14.5	11.9 (31.8)*	2017
Total RHD mortality (% of deaths)	0.14	0.2	0.17 (.5)*	2017
DALYs attributable to CVD (%)	4.1	5.1	4.6 (14.7)*	2017
AF and atrial flutter (%)	0.13	0.12	0.12 (.5)*	2017
Prevalence of RHD (%)	0.9	1.1	1.0 (.5)*	2017
<b>Tobacco and alcohol</b>				
Prevalence of adult tobacco use ( $\geq 15$ years old) (%)**	19.1 (36.1) <sup>f</sup>	7.1 (6.8) <sup>f</sup>	-	2013
Prevalence of youth (13–15-year-olds) tobacco use (%)	13.3	9.5	-	2018
Estimated direct (healthcare-related) cost of tobacco use in your population (in current US\$)	-	-	-	2018
Proportion of premature CVD mortality attributable to tobacco (%)	-	-	1 (10) <sup>f</sup>	2004
Recorded alcohol consumption per capita ( $\geq 15$ years) (in litres of pure alcohol) (three-year average)	-	-	7.0	2016–18
<b>Raised blood pressure and cholesterol</b>				
Population with raised BP (SBP $\geq 140$ mmHg or DBP $\geq 90$ mmHg) (%)**	16.8 (24.1) <sup>f</sup>	15.0 (20.1) <sup>f</sup>	15.9	2013
Population with raised TC ( $\geq 5.0$ mmol/l) (%)**	2.4	3.3	2.9 (38.9) <sup>f</sup>	2013
DALYs attributable to hypertension (%)	2.36	3.3	2.81 (8.7)*	2017
Mortality caused by hypertensive heart disease (% of deaths)	0.81	2.94	1.82 (1.7)*	2017
<b>Physical activity</b>				
Adolescents (11–17 years old) who are insufficiently active ( $< 60$ minutes of moderate- to vigorous-intensity PA daily) (%)	-	-	- (80.7) <sup>f</sup>	2010
Adults (age-standardised estimate) who are insufficiently active ( $< 150$ minutes of moderate-intensity PA per week, or $< 75$ minutes of vigorous-intensity PA per week) (%)	11	17.6	14.6 (27.5)*	2016
<b>Overweight and obesity</b>				
Adults (15–64 years old) who are overweight (BMI $\geq 25$ – $< 30 \text{ kg/m}^2$ ) (%)**	9.1	19.0	14.3 (38.9)*	2013
Prevalence of obesity (BMI $\geq 30 \text{ kg/m}^2$ ) (%)**	0.8	4.7	2.8 (13.1)*	2013
<b>Diabetes</b>				
Defined population with fasting glucose $\geq 126$ mg/dl (7.0 mmol/l) or on medication for raised blood glucose (age-standardised) (%)	4.3 (9)*	4.5 (8)*	4.4	2014
Prevalence of diabetes (20–79 years old) (%)	-	-	5.1 (9.3) <sup>f</sup>	2019

CVD, cardiovascular disease; RHD, rheumatic heart disease; DALYs, disability-adjusted life years; AF, atrial fibrillation; SBP, systolic blood pressure; DBP, diastolic blood pressure; TC, total cholesterol; PA, physical activity; BMI, body mass index.

\*IHME Global data<sup>10</sup>

\*\*STEPS data<sup>8</sup>

<sup>f</sup>WHO Global data<sup>4</sup>

<sup>#</sup>IDF Diabetes Atlas.<sup>11</sup>

## Part C: Clinical practice and guidelines

### Health system capacity

The country had an average of 1.3 physicians and 12.04 nurses per 10 000 in 2017 and 2018, respectively, with 16 hospital beds per 10 000 people in 2006. In Rwanda, locally relevant clinical tools to assess CVD risk and recent clinical guidelines for CVD prevention are available.<sup>12</sup> Guidelines published in 2016 by the Ministry of Health (MoH) for the detection and management of the most common NCD include heart failure, hypertension, cardiomyopathy and AF.<sup>12</sup> Clinical algorithms to manage pharyngitis, acute rheumatic fever and RHD are also incorporated.<sup>12</sup> In 2013, the Minister of Health, Dr Agnes Binagwaho, deplored that 'Health authorities in many countries rely on regional estimates of the burden of RHD given the absence of national disease registries and underreporting or misdiagnosing of acute and chronic cases of RHD'.<sup>13</sup> Rwanda's participation in a prospective, international, multi-centre, hospital-based registry for RHD and rheumatic fever, the REMEDY study,<sup>14</sup> led to developing a national register of people with a confirmed diagnosis of rheumatic fever and RHD. This register started with post-RHD valve surgery patients who were on anticoagulation.<sup>15</sup> Although there is a system to measure the quality of care provided to people who have suffered acute cardiac events, no national guidelines for the treatment of tobacco dependence exists.<sup>9</sup> The national guidelines for the integrated and decentralised management of NCD also include the detection and management of diabetes in detail.<sup>12</sup>

### Essential medicines and interventions

All the essential medicines for CVD were reported being available within the public health sector in 2016 and 2017.<sup>16</sup> Provision for secondary prevention of rheumatic fever and RHD is available in the public health sector but not for CVD risk stratification or the measurement of TC.<sup>4</sup>

### Secondary prevention and management

Almost 16% of hypertensive patients were receiving medical treatment in 2012,<sup>8</sup> while no information is available about the number of patients with AF on therapy or those with a history of CVD receiving medication. The ongoing implementation of the National NCD policy since 2015 includes integrated and decentralised care and follow up for the most common CVD, using electronic medical records and a health medical information system is expected to improve data collection and processing.<sup>17,18</sup>

## Part D: Cardiovascular disease governance

A national strategy or plan that addresses NCD, CVD and their risk factors specifically has been developed along with a dedicated budget for its implementation.<sup>4,19</sup> Integrating RHD into the national NCD strategic plan is also underway.<sup>20</sup> In each ministry, the government established a Single Project Implementation Unit.<sup>21</sup> Rwanda also has a national surveillance system that includes CVD and their risk factors.<sup>8</sup> Although not yet adopted, a draft national tobacco control plan has recently been finalised, and there is a national multi-sectoral co-ordination mechanism for tobacco control.<sup>9</sup> The

capital city, Kigali, has been chosen as part of an international project for a 'smoke-free city' supported by Vital Strategies and the Bloomberg Foundation since 2019.<sup>22</sup>

Collaborative projects for NCD interventions, which include CVD, have been implemented between the MoH and non-health ministries and civil societies in Rwanda.<sup>23</sup> However, the percentage of total annual government expenditure on cardiovascular healthcare is not known.

Rwanda was included in a project, WHO-CHOICE, incorporating a cost-effectiveness modelling tool that gathers national data, which can be used for developing the most effective interventions for leading causes of disease burden.<sup>24</sup> The model can be adjusted according to the specific needs of the country and assists policymakers in planning and prioritising services at a national level.<sup>24</sup> Whether Rwanda has implemented the model since it became available in 2003 is unknown. However, since 2019, Rwanda has been among the priority countries to become part of the governance mechanism of the United Nations-initiated 'Defeat-NCD Partnership', aiming to support four NCD-related areas, national capacity building, community health scale-up, marketplace and financing.<sup>25</sup>

### Assessment of policy response

No legislation exists that mandates health financing for CVD. However, legislation mandating essential CVD medicines at affordable prices has been implemented.<sup>26</sup> Similarly, legislation is employed in areas where smoking is banned, there are visible warnings on tobacco packs, advertising and measures to protect tobacco control policies from tobacco industry interference.<sup>9</sup> The excise tax of the final consumer price of tobacco products was 54% in 2018,<sup>9</sup> and 38.9% for alcohol in 2003.<sup>27</sup> Policies that ensure nationwide access to healthcare professionals and facilities have been developed,<sup>28</sup> as well as policy interventions facilitating PA.<sup>29</sup> An original 'car-free day' initiative promoting going green, mass sport and screening NCD risk factors, including hypertension, has been introduced in Kigali city since 2016 and is progressively expanding to smaller cities throughout the country.<sup>30</sup>

There is no sustainable funding for CVD from taxation or any taxes on unhealthy foods or sugar-sweetened beverages.<sup>31</sup> No legislation banning the marketing of unhealthy foods to minors exists nor that mandating clear and visible warnings on foods that are high in calories, sugar or saturated fats. No policies have been implemented that ensure screening of individuals at high risk of CVD nor policy interventions that promote a diet to reduce CVD risk.

### Stakeholder action

Non-governmental organisation advocacy for CVD policies and programmes in Rwanda is progressing via healthcare services.<sup>32</sup> Civil society through the Rwanda NCD Alliance (RNCDA)<sup>33</sup> and other organisations such as Partners in Health, Rwanda are involved in identifying, developing and implementing the national NCD strategic plan.<sup>25,34</sup> No advocacy champions have been identified for RHD in Rwanda.


Involvement of civil society in the development and implementation of a national CVD prevention and control

**RWANDA – JULY 2020**


**Status of Cardiovascular Disease (CVD) and Non-communicable diseases (NCD)**

## Country Demographics

World Bank Classification  
**Low** income




**83%**  
of population living in rural areas  
60% (Sub-Sahara Africa)





**RWANDA**

**0.17%**  
of total mortality caused by RHD  
Global data: 0.51%



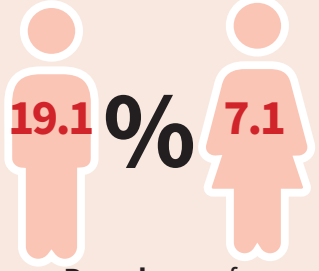
**1.02%**  
Prevalence of rheumatic heart disease (RHD)  
Global data: 0.53%




**1%**  
of premature CVD mortality attributable to tobacco  
Global data: 10%



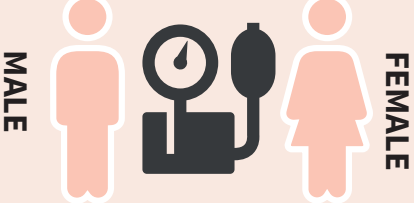
**19.1%** MALE **7.1%** FEMALE  
Prevalence of tobacco use age ≥15  
Global data: 36.1% (male) 6.8% (female)



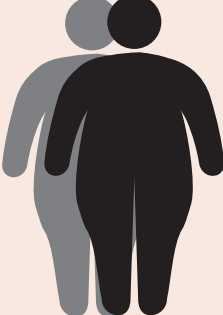
**1.82%**  
of deaths caused by hypertensive heart disease  
Global data: 1.65%




**16.8%** MALE **15%** FEMALE  
of population with raised blood pressure (SBP ≥140 or DBP ≥90)  
Global data: 24.1% (male) 20.1% (female)




**2.8%**  
Prevalence of obese adults (BMI of ≥30 kg/m<sup>2</sup>)  
Global data: 13.1%



**11.92%**  
of deaths caused by CVD  
Global data: 31.8%



**2.9%**  
of population with raised total cholesterol (≥5.0 mmol/L)  
Global data: 38.9%



**5.1%**  
Prevalence of diabetes (ages 20-79)  
3.9% (Africa)







**RWANDA**

**Health System Capacity**



**1.3**

Number of physicians (per 10,000 population)



**12.04**

Number of nurses (per 10,000 population)



**16**

Number of hospital beds (per 10,000 population)

**KEY:**

No data



Not in place



In process/ partially implemented



In place



**Clinical Practice and Guidelines**

Locally-relevant (national or subnational level):

Clinical tool to assess CVD risk .....

Guidelines for treatment of tobacco dependence .....

**Clinical Guidelines for:**

The detection and management of atrial fibrillation .....

The detection and management of acute rheumatic fever .....

The detection and management of rheumatic heart disease .....

The detection and management of diabetes .....

CVD prevention (within the last 5 years) .....

A system to measure the quality of care provided to people who have suffered acute cardiac events .....

RWANDA

**Cardiovascular Disease Governance**

**A national strategy or plan that addresses:**

CVDs and their specific risk factors .....

NCD and their risk factors .....

Rheumatic heart disease prevention and control as a priority .....

A national surveillance system that includes CVDs and their risk factors .....

**Stakeholder action**

Non-governmental organizations' advocacy for CVD policies and programmes .....

Civil society involved in developing and implementing of national CVD prevention and control plan .....

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plan was discussed at a United Nations General Assembly meeting, where the minister of health of Rwanda indicated the importance of co-ordination.<sup>35</sup> The need for civil society's involvement in a national multi-sectoral co-ordination mechanism for combating NCD and reducing their risk factors was iterated in 2015.<sup>32</sup> Civil society organisations are regularly part of an informal consultative MoH/Rwanda Biomedical Centre Technical Working Group on NCD.<sup>32</sup> However, the draft concept and composition document for a high-level co-ordination mechanism has been prepared but not yet submitted for approval by the government. No data are available on specific activities aimed at a 25% reduction in premature CVD mortality by 2025 by cardiology professional associations. A hypertension survey among adults working at a tertiary institution in Rwanda showed it is possible to reach employees at their workplace. However, there is no indication of hypertension screening by businesses at workplaces.<sup>36</sup>

As part of the data gathered for Rwanda, the following strengths, weaknesses, threats and priorities are summarised.

### Strengths

The National NCD Strategic Plan 2014–2019 emanated from the National NCD policy 2013, the Rwandan Health Sector Strategic Plan 2013–2018 and the Rwandan Economic Development and Poverty Reduction Strategy II (EDPRS) 2013–2018.<sup>19</sup> The main objective of the national strategic plan was to develop a robust monitoring and evaluation system to track the NCD burden of disease in the country.<sup>19</sup> The integration of NCD monitoring tools in the national health information system and electronic medical record, and the implementation of the Bloomberg Philanthropies-funded Verbal Autopsy Program are expected to improve morbidity and mortality data collection.<sup>37</sup> Moreover, Rwanda has successfully implemented an integrated and decentralised chronic care model for most common NCD and CVD at the district hospital and primary healthcare levels.<sup>38</sup>

The Rwanda Biomedical Centre is the implementing entity for NCD prevention and control activities in terms of the policy. The NCD division, on the other hand, is responsible for the day-to-day implementation of interventions.<sup>17</sup> The management, monitoring and evaluation of implemented activities are under the supervision of existing organs and structures in the national health system. The focus of this policy includes CVD, and its goal is to alleviate the burden of NCD and their risk factors along with protecting the Rwandan population from related premature morbidity and mortality.<sup>17</sup>

In 2015, a team of recognised experts developed national NCD guidelines according to international standards.<sup>12</sup> A national surveillance system, the STEP survey, including CVD and their risk factors, has also been implemented.<sup>8</sup>

For a country that underwent the worst genocide in 1994, Rwanda has made tremendous progress regarding financial access and risk protection by strengthening pre-payment mechanisms, which include community-based health insurance and other health insurance schemes, also covering NCD.<sup>39</sup> Rwanda is one of a few African countries that has developed a sports policy.<sup>29</sup> Probably this was a way in

achieving post-conflict reconciliation and supporting the role that sport plays in the health and well-being of communities to reduce CVD risk.<sup>40</sup>

Rwanda is benefiting from multilateral initiatives for national NCD capacity building such as the Smoke-free City project, and the Verbal Autopsy programme.<sup>22,37</sup> Also, the United Nations-anchored multilateral defeat-NCD partnership kicked off recently, as well as the establishment of regional NCD training, specialised care and research-driven centres of excellence through the East African community.<sup>34,41</sup>

### Threats

In Rwanda, mortality data became available from hospital registries to demonstrate that NCD are an important cause of death and place a heavy burden on the country, along with prevention and control services, which are limited.<sup>17</sup> In 2016, NCD were estimated to account for 44% of all deaths, of which 14% included CVD.<sup>16</sup>

Tobacco use among adolescent men in 2018 was about 13%, which is slightly lower than the global consumption of 18.2% for this group.<sup>4</sup> In 2012, 19% of adult men used tobacco, while 7% of women adopted the habit. The recorded average (three-year) alcohol consumption per capita was 7 litres pure alcohol, which is more than most of the other African countries under investigation.<sup>4</sup>

Because of population ageing, there has been an increase in the incidence of NCD.<sup>42</sup> The prevalence of hypertension, a leading cause of CVD, is high in Rwanda.<sup>7</sup> Other risk factors are diabetes, obesity, salt intake, smoking, lack of exercise and a low intake of fruit, vegetables and unsaturated fats.<sup>19</sup> The age-standardised estimate for raised BP in 2015 was 26.7%, which is higher than the global level (22.1%) but slightly lower than that for Africa (27.4%), whereas the prevalence among 15–64-year-olds was about 16% in 2013.<sup>48</sup> The prevalence of obesity was more predominant in urban areas (10.2%) and in Kigali city (7.7%), with 14.3% of the adult population, 15–64 years old, being overweight.

Compared to neighbouring countries Uganda (0.96%) and Tanzania (1.01%), Rwanda had a slightly higher prevalence of RHD, although low at 1.02%. Total RHD mortality rate was also higher than these countries (0.17 vs 0.14% for both countries), and that of hypertensive heart disease (1.82 vs 1.13% for Uganda and 1.43% for Tanzania).<sup>10</sup>

### Weaknesses

Although all 10 essential CVD drugs are available, these are only at the district hospital level (public sector) and not always at primary healthcare centres.<sup>43</sup>

A national tobacco control plan and guidelines to treat tobacco dependence are lacking, and sustainable funding for CVD from taxation of tobacco or other 'sin' products does not exist. However, there is a national multi-sectoral co-ordination mechanism for tobacco control.<sup>9</sup>

Primary healthcare facilities generally do not provide TC measurements, and CVD risk stratification at this level is also not prioritised. Rwanda, along with Cameroon, Mozambique, Namibia and Sudan, has not yet introduced a policy regarding the taxation of unhealthy foods or sugar-sweetened beverages to combat obesity and other related NCD.<sup>44</sup>

Legislation banning the marketing of unhealthy foods to minors and mandating clear and visible warnings on foods that are high in calories, sugar or saturated fats are also lacking. Policy interventions to reduce CVD risk through promoting a healthy diet have not yet been introduced.

### Priorities

Rwanda's vision is to have the entire population protected from premature morbidity and mortality related to NCD. The aim is to improve access and quality of care to reach their target along with improved general knowledge about prevention of risk factors and early detection.<sup>19</sup>

Other strategies to reduce NCD are developing an inter-sectoral and decentralised policy, which includes prevention and management of NCD, a national protocol for NCD, and development of healthcare providers' skills.<sup>42</sup>

Although the health sector has accomplished significant achievements, the following areas need to be addressed if the quality of NCD service delivery is to be improved:

- integration and accessibility of NCD services at all levels of the healthcare system and specialised services
- high NCD costs
- basic equipment and specialised infrastructure for NCD
- essential drugs and advanced NCD treatment
- accurate NCD data management.<sup>17</sup>

This publication was reviewed by the PASCAR governing council and approved by the president of the Rwanda Heart Foundation.

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# Tanzania Country Report

## PASCAR and WHF Cardiovascular Diseases Scorecard project

Robert Mvungi, Jean M Fourie, Oana Scarlatescu, George Nel, Wihan Scholtz

### Abstract

Data collected for the World Heart Federation Scorecard project regarding the current state of cardiovascular disease prevention, control and management, along with related non-communicable diseases in Tanzania are presented. Furthermore, the strengths, threats, weaknesses and priorities identified from these data are highlighted in concurrence with related sections in the attached infographic. Information was collected using open-source datasets from the World Bank, the World Health Organization, Institute for Health Metrics and Evaluation, the International Diabetes Federation and relevant government publications.

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On behalf of the World Heart Federation (WHF), the Pan-African Society of Cardiology (PASCAR) co-ordinated data collection and reporting for the country-level Cardiovascular Diseases Scorecard to be used in Africa.<sup>1,2</sup> Tanzania was included as one of the countries and the Tanzania Cardiac Society (non-WHF member) assisted with collating and verifying the data. In this report, we summarise Tanzania's strengths, threats, weaknesses and priorities identified from the collected data, along with needs to be considered in conjunction with the associated sections in the accompanying infographic. Datasets that were used included open-source data from the World Bank, World Health Organization (WHO), Institute for Health Metrics and Evaluation, the International Diabetes Federation and government publications.

### Part A: Demographics

According to the World Bank (2018), Tanzania is a low-income country with 66% of its people living in rural areas.<sup>3</sup>

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In 2011, 49.1% of the population were living below the US\$1.9-a-day ratio. Life expectancy at birth in 2018 was 63 years for men and 67 years for women. The general government health expenditure was about 1.58% of the gross domestic product (GDP) in 2017, while the country GDP per capita was US\$1061 in 2018.<sup>3</sup>

### Part B: National Cardiovascular Disease Epidemic The national burden of cardiovascular disease (CVD) and non-communicable diseases (NCD) risk factors

Tanzania's premature deaths attributable to CVD (age 30–70 years) matched those of Kenya and Mozambique at 8% in 2012.<sup>4</sup> In 2017, the age-standardised total CVD death rate was almost 13%, which is higher than most of the other African countries in our study. The percentage of disability-adjusted life years (DALYs) resulting from CVD for men was 5.07% and 4.63% for women. The prevalence of atrial fibrillation (AF) and atrial flutter was 0.13%, while that of rheumatic heart disease (RHD) was around 1%. The total RHD mortality rate was 0.14% of all deaths (Table 1).<sup>5</sup>

### Tobacco and alcohol

The prevalence of tobacco use in adult men and women (15 years and older) was 27.5 and 3.8%, respectively (Table 1).<sup>6</sup> No data were available for the young population (13–15-year-olds). However, in a representative sample of school-going adolescents ( $\leq 12$ – $\geq 18$  years old), 8.2% were using tobacco in 2014.<sup>7</sup> Most of these adolescents fell in the 13–17-year age group.<sup>7</sup> For 2018, the estimated annual direct cost of tobacco use was also not available,<sup>6</sup> while the premature CVD mortality rate attributable to tobacco was 3% of the total deaths.<sup>8</sup> The average recorded alcohol consumption per capita ( $\geq 15$  years old) for three years (2016–18) was 7.3 litres (Table 1).<sup>9</sup>

### Raised blood pressure and cholesterol

The percentage of men and women with raised blood pressure (BP) (systolic BP  $\geq 140$  mmHg or diastolic BP  $\geq 90$  mmHg) in 2015 was 26.6 and 27.7%, respectively.<sup>9</sup> The percentage of DALYs lost because of hypertension was 3.23%, whereas mortality caused by hypertensive heart disease was 1.43% in 2017 (Table 1).<sup>5</sup> Country data available for those with raised total cholesterol (TC,  $\geq 5.0$  mmol/l; age-standardised estimate) was 23.7% in 2008.<sup>9</sup>

## Physical activity

In 2016, the percentage of adolescents aged 11–17 years old who were insufficiently active [ $< 60$  minutes of moderate- to vigorous-intensity physical activity (PA) daily] was 82.1%.<sup>10</sup> The age-standardised estimate for adults who were insufficiently active ( $< 150$  minutes of moderate-intensity PA per week, or  $< 75$  minutes of vigorous-intensity PA per week) was 6.5% in 2016 (Table 1).<sup>9</sup>

## Overweight and obesity

The prevalence of overweight [body mass index (BMI)  $\geq 25$ – $< 30$  kg/m<sup>2</sup>] and obesity (BMI  $\geq 30$  kg/m<sup>2</sup>) in adults 25 years and older was 27.7 and 8.4%, respectively in 2016 (Table 1).<sup>9</sup> Compared to neighbouring country Uganda (19.1, 4.6%), Tanzania's population is far more overweight and obese. More women (35.5%) than men (19.6%) were overweight and similarly, far more women (12.7%) were found to be obese than the men (4%).<sup>9</sup>

## Diabetes

In 2014, the percentage of the defined population with a fasting blood glucose level  $\geq 7.0$  mmol/l or on medication for raised blood glucose (age-standardised) was 6% for men and 6.1% for women.<sup>9</sup> The prevalence of age-adjusted (20–79 years) diabetes in 2019 was 5.7%, which is lower than the global estimate of 9.3% (Table 1).<sup>11</sup>

## Part C: Clinical practice and guidelines

### Health system capacity

The country had an average of 0.14 physicians and 5.84 nurses per 10 000 of the population in 2016 and 2017, respectively, and seven hospital beds per 10 000 people in 2010.<sup>9</sup>

Locally-relevant clinical tools along with recent clinical guidelines for preventing CVD were adapted using the WHO CVD risk-assessment tool and to some extent atherosclerotic cardiovascular disease (ASCVD) risk estimation and the

Table 1. Cardiovascular disease indicators for Tanzania

Indicators	Male	Female	Total	Year
<b>Status of national the CVD epidemic</b>				
Premature CVD mortality (30–70 years old) (% deaths)	-	-	8	2012
Total CVD mortality (% of deaths)	12.5	13.3	12.9 (31.8)*	2017
Total RHD mortality (% of deaths)	0.1	0.2	0.1 (.5)*	2017
DALYs attributable to CVD (%)	5.1	4.6	4.9 (14.7)*	2017
AF and atrial flutter (%)	0.2	0.1	0.1 (.5)*	2017
Prevalence of RHD (%)	0.9	1.1	1.0 (.5)*	2017
<b>Tobacco and alcohol</b>				
Prevalence of adult tobacco use ( $\geq 15$ years old) (%)	27.5 (36.1)**	3.8 (6.8)**	-	2015
Prevalence of youth ( $\leq 12$ – $\geq 18$ years old) tobacco use (%) <sup>†</sup>	8.7	7.7	8.2	2014
Estimated direct (healthcare-related) cost of tobacco use in your population (current US\$)	-	-	-	2018
Proportion of premature CVD mortality attributable to tobacco (%)	-	-	3 (10)*	2004
Recorded alcohol consumption per capita ( $\geq 15$ years old) (litres of pure alcohol) (three-year average)	-	-	7.3	2016–18
<b>Raised blood pressure and cholesterol</b>				
Population with raised BP (SBP $\geq 140$ mmHg or DBP $\geq 90$ mmHg) (%)	26.7 (24.1)**	27.7 (20.1)**	-	2018
Population with raised TC ( $\geq 5.0$ mmol/l) (%)	21.6	25.5	23.7 (38.9)**	2008
DALYs attributable to hypertension (%)	3.4	3	3.2 (8.7)*	2017
Mortality caused by hypertensive heart disease (% of deaths)	0.8	2.2	1.4 (1.7)*	2017
<b>Physical activity</b>				
Adolescents (11–17 years old) who are insufficiently active ( $< 60$ minutes of moderate- to vigorous-intensity PA daily) (%)	78.2	86.0	82.1 (80.7)*	2016
Adults (age-standardised estimate) who are insufficiently active ( $< 150$ minutes of moderate-intensity PA per week, or $< 75$ minutes of vigorous-intensity PA per week) (%)	5.8	7.1	6.5 (27.5)*	2016
<b>Overweight and obesity</b>				
Adults who are overweight (BMI $\geq 25$ – $< 30$ kg/m <sup>2</sup> ) (%)	19.6	35.5	27.7 (38.9)**	2016
Prevalence of obesity (BMI $\geq 30$ kg/m <sup>2</sup> ) (%)	4.0	12.7	8.4 (13.1)**	2016
<b>Diabetes</b>				
Defined population with fasting glucose $\geq 126$ mg/dl (7.0 mmol/l) or on medication for raised blood glucose (age-standardised) (%)	6.0 (9)**	6.1 (8)**	-	2014
Prevalence of diabetes (20–79 years old) (%)	-	-	5.7 (9.3) <sup>#</sup>	2019

CVD, cardiovascular disease; RHD, rheumatic heart disease; DALYs, disability-adjusted life years; AF, Atrial fibrillation; SBP, systolic blood pressure; DBP, diastolic blood pressure; TC, total cholesterol; BMI, body mass index.

\*IHME global data exchange<sup>5</sup>

\*\*WHO global data<sup>9</sup>

<sup>†</sup>Shayo FK. BMC Public Health<sup>7</sup>

<sup>#</sup>IDF Diabetes Atlas.<sup>11</sup>

American College of Cardiology guidelines.<sup>12,13</sup> No national guidelines for the treatment of tobacco dependence have been adopted,<sup>6</sup> although guidelines for the detection and management of AF are available.<sup>14</sup>

Locally relevant clinical guidelines for the management of pharyngitis, acute rheumatic fever and RHD have been incorporated into the Standard Treatment Guidelines (STG) and National Essential Medicine List (NEMLIT).<sup>14</sup> No data were found regarding clinical registers of people with a history of rheumatic fever and RHD or a system to measure the quality of care provided to people who have suffered acute cardiac events.

Guidelines for managing diabetes in Tanzania were also incorporated into the STG and NEMLIT in 2017.<sup>14</sup> In 2012, Mayige *et al.*<sup>15</sup> called for an urgent need to strengthen diabetes services through the National Diabetes Project that would also benefit other NCD in the country. These researchers also suggested the need for secondary prevention measures for those at high risk of developing NCD, including CVD.<sup>15</sup>

### Essential medicines and interventions

Angiotensin converting enzyme (ACE) inhibitors, aspirin,  $\beta$ -blockers, metformin and insulin are included in the list of essential medicines at primary care facilities in the public health sector.<sup>14</sup> However, statins, warfarin and clopidogrel, although listed, are not available at healthcare centres.<sup>14</sup>

The measurement of TC is generally available at the primary healthcare level. However, CVD risk stratification or the provision of secondary prevention of rheumatic fever and RHD is not available in public health facilities.<sup>9</sup>

### Secondary prevention and management

No information is available regarding the percentage of patients with AF on treatment or those with a history of CVD receiving medication. In an article by Edwards *et al.*, 10% of patients with hypertension were receiving medical treatment.<sup>16</sup>

## Part D: Cardiovascular disease governance

A national strategy or plan addressing CVD, and specifically their risk factors, has been developed.<sup>17</sup> Although there is no dedicated budget, a unit in the national ministry of health (MoH) is responsible for its implementation.<sup>9</sup> A national strategy and action plan that addresses NCD, including CVD and their risk factors, has been formulated,<sup>17,18</sup> but not for RHD prevention and control as a priority. A national surveillance system, including CVD and their risk factors, has been employed.<sup>19,20</sup>

Unfortunately no national tobacco control plan exists, but there is a multi-sectoral co-ordination mechanism for tobacco control.<sup>6</sup> While no data on collaborative projects between the MoH and non-health ministries for CVD interventions are available, more than 100 stakeholders from government and other organisations participated in a collaborative multi-sectoral initiative leading to the launch of a national NCD programme.<sup>20</sup> The percentage of the total annual government expenditure on cardiovascular healthcare is not yet known. In an article published in 2017, the economic and health benefits of CVD prevention were shown to have been modelled.<sup>21</sup>

### Assessment of policy response

No legislation mandating health financing for CVD/NCD has been developed or implemented. However, a policy exists that suggests all medicines in the National Essential Medicines List have generic names as these are available at affordable prices.<sup>22</sup> Furthermore, no judicial orders protecting patients' rights and mandating improved CVD interventions, facilities, health system procedures or resources have been implemented.

Regarding tobacco control, legislation on the following is functional:

- banning of smoking in indoor workplaces, public transport, indoor public places and other public places<sup>6</sup>
- clear and visible warnings on at least half of the principal display areas of tobacco packs<sup>23</sup>
- banning all forms of tobacco advertising, promotion and sponsorship.<sup>21</sup>

In contrast, measures to protect tobacco control policies from tobacco industry interference are absent.<sup>6</sup> No data are available on policies that ensure equitable nationwide access to healthcare professionals and facilities, screening of individuals at high risk of CVD or sustainable funding for CVD.

According to the WHO Global Health Observatory, taxes on unhealthy foods or sugar-sweetened beverages have existed since 2019, though the percentage of the excise tax is unknown.<sup>9</sup> The percentage of excise tax of the final consumer price of tobacco products is 36.7% and well below the WHO recommendation of 70%, while that of the final consumer price of alcohol products was 30% for beer.<sup>24,25</sup>

Legislation mandating clear and visible warnings on foods that are high in calories, sugar or saturated fats are in place but not for banning the marketing of unhealthy foods to minors.<sup>17</sup> Policy interventions that promote a diet to reduce CVD risk or that facilitate PA have also not been realised.

### Stakeholder action

Non-governmental organisation advocacy for CVD policies and programmes has been adopted,<sup>26</sup> as has the involvement of the Tanzania Tobacco Control Forum (TTCF) in the development and implementation of a national tobacco control plan.<sup>6</sup> Civil society involvement in the development and implementation of a national CVD prevention and control plan and the national multi-sectoral co-ordination mechanism for NCD/CVD have been established.<sup>27</sup> However, no active involvement of patients' organisations in the advocacy for CVD/NCD prevention and management or group engagement for RHD exists.

No data are available on specific activities aimed at a 25% reduction in premature CVD mortality by 2025 by cardiology professional associations. However, in a pilot study, hypertension screening by businesses at workplaces was recommended to be feasible.<sup>28</sup>

As part of the data collected for Tanzania, the following strengths, weaknesses, threats and priorities are summarised.

### Strengths


The Strategic Plan and Action Plan for the Prevention and Control of NCD in Tanzania 2016–2020, was developed in

**TANZANIA – JULY 2020**


**Status of Cardiovascular Disease (CVD) and Non-communicable diseases (NCD)**

**Country Demographics**

**World Bank Classification**  
**Low income**




**66%**  
of population living in rural areas  
60% (Sub-Sahara Africa)





**TANZANIA**

**0.14%**  
of total mortality caused by **RHD**  
Global data: 0.51%



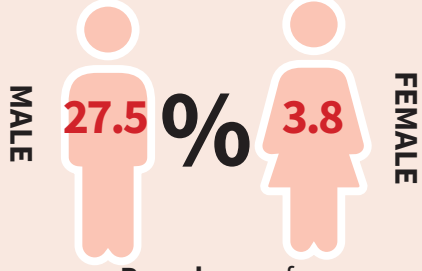
**1.01%**  
Prevalence of rheumatic heart disease (**RHD**)  
Global data: 0.53%




**No Data**  
of premature CVD mortality attributable to **tobacco**  
Global data: 10%




**27.5%** **MALE** **3.8%** **FEMALE**  
Prevalence of **tobacco use age ≥15**  
Global data: 36.1% (male) 6.8% (female)



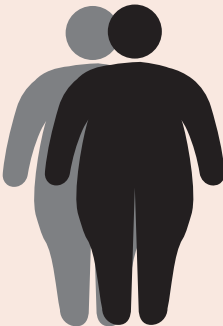
**1.43%**  
of deaths caused by **hypertensive heart disease**  
Global data: 1.65%




**26.6%** **MALE** **27.7%** **FEMALE**  
of population with raised **blood pressure** (SBP ≥140 or DBP ≥90)  
Global data: 24.1% (male) 20.1% (female)




**8.4%**  
Prevalence of obese adults (BMI of ≥30 kg/m<sup>2</sup>)  
Global data: 13.1%



**12.91%**  
of **deaths** caused by CVD  
Global data: 31.8%



**23.7%**  
of population with raised total **cholesterol** (≥5.0 mmol/L)  
Global data: 38.9%



**5.7%**  
Prevalence of diabetes (**ages 20-79**)  
3.9% (Africa)

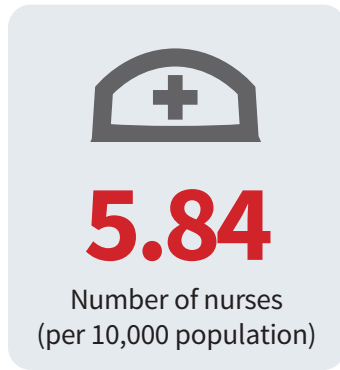
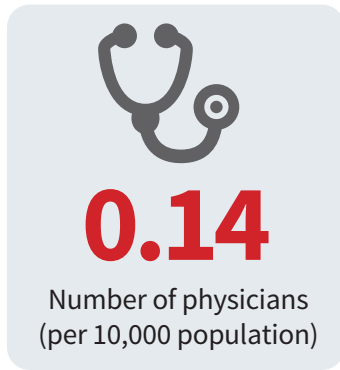






**TANZANIA**

**Health System Capacity**



**KEY:** No data Not in place In process/ partially implemented In place

**Clinical Practice and Guidelines**

Locally-relevant (national or subnational level):

Clinical tool to assess CVD risk .....

Guidelines for treatment of tobacco dependence .....

**Clinical Guidelines for:**

The detection and management of atrial fibrillation .....

The detection and management of acute rheumatic fever .....

The detection and management of rheumatic heart disease .....

The detection and management of diabetes .....

CVD prevention (within the last 5 years) .....

A system to measure the quality of care provided to people who have suffered acute cardiac events .....

TANZANIA

**Cardiovascular Disease Governance**

**A national strategy or plan that addresses:**

CVDs and their specific risk factors .....

NCD and their risk factors .....

Rheumatic heart disease prevention and control as a priority .....

A national surveillance system that includes CVDs and their risk factors .....

**Stakeholder action**

Non-governmental organizations' advocacy for CVD policies and programmes .....

Civil society involved in developing and implementing of national CVD prevention and control plan .....

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response to a growing problem of NCD in the country.<sup>17</sup> The purpose of the plan is to help achieve preventative national goals and establish collaboration with ministries, other relevant governmental and non-governmental agencies, interested partners and the public at large.

Results from the STEPS survey were incorporated into the national NCD strategic plan, along with various guidelines and policy documents that were developed. Examples are the WHO global action plan, the Health Sector Strategic Plan IV of 2015–2020, and Global Sustainable Goals to curb the growing NCD problem.<sup>12</sup> In 2012, the STEPS survey on NCD risk factors revealed that the burden of diabetes and CVD was high, with the prevalence of hypertension estimated to be around 26%. Hyperglycaemic disorders (pre-diabetes and diabetes) were high at all ages, with an estimated total prevalence of around 20%.<sup>19</sup> Locally relevant (national or sub-national) clinical guidelines for the detection and management of AF and atrial flutter are incorporated in the integrated standard guidelines.<sup>14</sup>

Non-governmental organisations such as the Heart Foundation of Tanzania (HFT) play a very active role in advocacy for CVD policies and programmes. The involvement of civil society, such as the TTCF,<sup>6</sup> assisted in the development and implementation of a national tobacco control plan. Legislation regarding tobacco control is also in effect about banning smoking in indoor workplaces, public transport, indoor public places and other public places.

A law mandating clear and visible warnings on foods that are high in calories, sugar and saturated fats has also been implemented. Since 2019 Tanzania has introduced taxes on sugar-sweetened beverages. Other civil society involvement includes the development and implementation of a national CVD prevention and control plan as well as the national multi-sectoral co-ordination mechanism for NCD/CVD through the Tanzania NCD alliance,<sup>26</sup> HFT and Tanzania Diabetes Association.

### Threats

The WHO STEPS survey, which was carried out in the country in 2012, showed that the levels of NCD risk factors are high.<sup>19</sup> These risk factors included the prevalence of diabetes, hypertension, obesity, and alcohol consumption. Low levels of PA and eating less than five servings of fruit and/or vegetables were also reported.<sup>19</sup>

Although the global data reflecting the total percentage of deaths caused by CVD is 31.8%, Tanzania's was almost 13% in 2017.<sup>5</sup> Mortality caused by hypertensive heart disease was 1.43%, which was slightly lower compared to the 1.65% of the global data (infographic).

### Weaknesses

Although surveillance and monitoring of NCD in East Africa, which includes Tanzania, have been implemented, NCD are still not sufficiently integrated into national health information and management systems.<sup>27</sup> There is also a limited capacity of health personnel for surveillance and data collection on NCD.<sup>27</sup>

The Standard Treatment Guidelines and National

Essential Medicines List are available, but these have not yet been implemented. In 2017, CVD essential medicines were not available at the public health level.<sup>14</sup> Aspirin, metformin and insulin were available at the dispensary level, while ACE inhibitors and  $\beta$ -blockers were the only drugs available at a primary healthcare level. Of the eight CVD essential drugs, simvastatin, warfarin and clopidogrel were available only at the hospital level.<sup>14</sup>

No data are available on policies that ensure equitable nationwide access to healthcare professionals and facilities or which ensure screening of individuals at high risk of CVD.

According to the executive director of the TTCF, Ms Kagaruki, Tanzania is behind other African countries in its progress towards implementing the WHO framework convention on tobacco control. Yet more than 10 years have elapsed since approval, with no legislation passed to replace the outdated 2003 Act.<sup>29</sup>

Legislation banning the marketing of unhealthy foods to minors and policy interventions that promote a diet that reduces cardiovascular risk or facilitate PA are not yet in place.

### Priorities

The objectives of the national NCD programme launched on 14 November 2019 include training physicians, nurses and community health workers and rolling out an NCD screening programme. Furthermore, they include reviewing and amending existing health policies in the country, establishing patient record systems, and awareness-raising and mobilisation at the community level.

### NCD burden

To reduce the burden of NCD through health promotion, and reduction, prevention, treatment and monitoring of their risk factors, particular attention should be given to interventions and surveillance to address this problem.<sup>30</sup>

### Diabetes

Tanzania introduced strategic interventions to reduce modifiable NCD and their risk factors by 2020.<sup>17</sup> One of the goals was to ensure a 10% relative reduction in the prevalence of diabetes from baseline, along with a 20% reduction in the overall mortality rate from diabetes. Actions to enable these reductions are:

- community sensitisation on a healthy diet and PA
- early detection and appropriate management of diabetes at all levels
- early detection and management of acute and chronic complications (foot, diabetic ketoacidosis, infections).<sup>17</sup>

### Cardiovascular disease

Goals for reducing CVD to be met by 2020 were also introduced.<sup>17</sup> These are a 25% relative reduction in the prevalence of raised BP from baseline, 10% reduction from baseline of TC, and 20% reduction in the overall mortality from CVD (hypertension, heart failure, stroke, rheumatic fever, RHD).

Actions to be taken are:

- community sensitisation on a healthy diet and PA
- early detection and appropriate management of CVD
- preventive treatment for stroke and myocardial infarction (aspirin, statins)
- preventive treatment for rheumatic fever (penicillin).<sup>17</sup>

This publication was reviewed by the PASCAR governing council and approved by the president of the Tanzania Cardiac Society.

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# Uganda Country Report

## PASCAR and WHF Cardiovascular Diseases Scorecard project

Emmy Okello, John Omagino, Jean M Fourie, Wihan Scholtz, Oana Scarlatescu, George Nel, Peter Lwabi

### Abstract

Data collected for the World Heart Federation Scorecard project regarding the current state of cardiovascular disease prevention, control and management, along with related non-communicable diseases in Uganda are presented. Furthermore, the strengths, threats, weaknesses and priorities identified from these data are highlighted in concurrence with related sections in the attached infographic. Information was collected using open-source datasets available online and relevant government publications.

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On behalf of the World Heart Federation (WHF), the Pan-African Society of Cardiology (PASCAR) co-ordinated data collection and reporting for a country-level Cardiovascular Diseases Scorecard to be used in Africa.<sup>1,2</sup> The Uganda Heart Association, the Department of Cardiology and Cardiac Catheterisation Laboratory at the Uganda Heart Institute provided PASCAR with assistance with collating and verifying these data, whereas the acting commissioner in charge of the non-communicable diseases department at the ministry of health (MoH) assisted with authenticating the data. Open-source datasets from the World Bank, the World Health Organization (WHO), Institute for Health Metrics

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and Evaluation, the International Diabetes Federation and government publications were used to collect data. Along with these collected data, we review the strengths, threats, weaknesses and priorities identified in conjunction with the associated sections in the accompanying infographic.

### Part A: Demographics

According to the World Bank (2018), Uganda is a low-income country with 76% of its people living in rural areas.<sup>3</sup> In 2016, almost 41.7% of the population were living below the US\$1.9-a-day ratio. Life expectancy at birth in 2018 was 61 and 65 years, respectively, for men and women.<sup>4</sup> The general government health expenditure was 1% of the gross domestic product (GDP) in 2017, while the country GDP per capita was US\$642.8 in 2018.<sup>4</sup>

### Part B: National cardiovascular disease epidemic

#### The national burden of cardiovascular disease (CVD) and non-communicable diseases (NCD) risk factors

Uganda's premature deaths attributable to CVD (age 30–70 years) are the same as neighbouring country Rwanda at 10% but higher than those of Tanzania (8%) and Ethiopia (6%).<sup>5</sup> In 2017, the age-standardised total CVD death rate was 9.85%, which was lower than the global rate of 31.8%.<sup>6</sup> The total rheumatic heart disease (RHD) mortality rate was 17.8% of all deaths.<sup>7</sup> The percentage of disability-adjusted life years (DALYs) resulting from CVD for men was 3.75% and 3.5% for women. The prevalence of atrial fibrillation (AF) and atrial flutter was 0.1%,<sup>6</sup> while that of RHD was 2.97% (Table 1).<sup>8</sup>

#### Tobacco and alcohol

The prevalence of tobacco use in adult men 15 years and older was 16.4% in 2015, while adult women (2.9%) hardly smoked.<sup>4</sup> However, STEPS data collected in 2014 indicated 9.6% of Ugandans, ages 18–69 years used tobacco, of which 16.8% were men.<sup>9</sup> Data available for the young smokers, 13–15 years old, revealed 19.3 and 15.8% boys and girls, respectively smoked tobacco in 2011.<sup>4,10</sup> The estimated annual direct cost of tobacco use was US\$41.56 m in 2017.<sup>4</sup> The premature CVD mortality rate attributable to tobacco was 2% of the total deaths, which is much lower than the global 10%.<sup>11</sup> The three-year (2016–18) average recorded alcohol consumption per capita ( $\geq 15$  years) was 12.2 litres, which is higher than most neighbouring countries (Table 1).<sup>4</sup>

### Raised blood pressure and cholesterol

In 2015, the percentage of men and women with raised blood pressure (BP) (systolic BP  $\geq$  140 mmHg or diastolic BP  $\geq$  90 mmHg) was 26.7 and 27.7%, respectively.<sup>4</sup> However, STEPS data revealed men with raised BP had a marginally lower prevalence of 25.8%, while that of women decreased by almost 5% to 22.9%.<sup>9</sup> The percentage of DALYs lost because of hypertension was 2.23%, whereas mortality caused by hypertensive heart disease was 1.13% in 2017.<sup>6</sup> According to the Uganda NCD risk-factor baseline survey (STEPS), 4.4% of men and 8.9% of women had raised total cholesterol ( $\geq$  5.0 mmol/l) in 2014 (Table 1).<sup>9</sup>

### Physical activity

Data for adolescents 11–17 years old revealed 85.7% was insufficiently active [ $<$  60 minutes of moderate- to vigorous-intensity physical activity (PA) daily] in 2016.<sup>12</sup> For adults, the age-standardised estimate was 5.5% of those who were insufficiently active ( $<$  150 minutes of moderate-intensity PA

per week, or  $<$  75 minutes of vigorous-intensity PA per week) in 2016.<sup>4</sup> STEPS data for 18–69-year-old adults revealed 3.7% of men and 4.9% of women were insufficiently active (Table 1).<sup>9</sup>

### Overweight and obesity

The prevalence of overweight [body mass index (BMI)  $\geq$  25– $<$  30 kg/m<sup>2</sup>] and obesity (BMI  $\geq$  30 kg/m<sup>2</sup>) in adults 18–69 years old was 19.1 and 4.6%, respectively.<sup>9</sup> Overweight women had a higher prevalence (27.1%) than the men (11.3%), with a similar pattern for obesity, 7.5 versus 1.8% in women and men, respectively (Table 1).<sup>9</sup> Global health data for adults 18 years and older provided a slightly higher prevalence of overweight (22.4%) and obesity (5.3%) in 2016.<sup>4</sup>

### Diabetes

The percentage of the defined population with a fasting glucose level  $\geq$  7.0 mmol/l or on medication for raised blood glucose levels in 2014 was 1.7% for men and 1.0% for

Table 1. Cardiovascular disease indicators for Uganda

Indicators	Male	Female	Total	Year
<b>Status of the national CVD epidemic</b>				
Premature CVD mortality (30–70 years old) (% deaths)	-	-	10	2012
Total CVD mortality (% of deaths)	9.09	10.8	9.85 (31.8)*	2017
Total RHD mortality (% of deaths)**	-	-	17.8 (.5)*	2017
DALYs attributable to CVD (%)	3.75	3.5	3.64 (14.7)*	2017
AF and atrial flutter (%)	0.1	0.09	0.1 (.5)*	2017
Prevalence of RHD (%)**	-	-	2.97 (.5)*	2017
<b>Tobacco and alcohol</b>				
Prevalence of adult tobacco use (18–69 years old (%)) <sup>†</sup>	16.8 (36.1)*	2.9 (6.8)*	9.6	2014
Prevalence of youth (13–15-year-olds) tobacco use (%)	19.3	15.8	-	2011
Estimated direct (healthcare-related) cost of tobacco use in your population (current US\$)			41.56 m	2017
Proportion of premature CVD mortality attributable to tobacco (%)	-	-	2 (10)*	2004
Recorded alcohol consumption per capita ( $\geq$ 15 years) (litres of pure alcohol) (three-year average)			12.2	2016–18
<b>Raised blood pressure and cholesterol</b>				
Population with raised BP (SBP $\geq$ 140 mmHg or DBP $\geq$ 90 mmHg) (%) <sup>†</sup>	25.8 (24.1)*	22.9 (20.1)*	-	2014
Population with raised total cholesterol ( $\geq$ 5.0 mmol/l) (%) <sup>†</sup>	4.4	8.9	6.7 (38.9)*	2014
DALYs attributable to hypertension (%)	2.2	2.3	2.23 (8.7)*	2017
Mortality caused by hypertensive heart disease (% of deaths)	0.6	1.8	1.13 (1.7)*	2017
<b>Physical activity</b>				
Adolescents (11–17 years old) who are insufficiently active ( $<$ 60 minutes of moderate- to vigorous-intensity PA daily) (%)	84.0	87.3	85.7 (80.7)*	2016
Adults (age-standardised estimate) who are insufficiently active ( $<$ 150 minutes of moderate-intensity PA per week, or $<$ 75 minutes of vigorous-intensity PA per week) (%) <sup>†</sup>	3.7	4.9	4.3 (27.5)*	2014
<b>Overweight and obesity</b>				
Adults who are overweight (BMI $\geq$ 25– $<$ 30 kg/m <sup>2</sup> ) (%) <sup>†</sup>	11.3	27.1	19.1 (38.9)*	2014
Prevalence of obesity (BMI $\geq$ 30 kg/m <sup>2</sup> ) (%) <sup>†</sup>	1.8	7.5	4.6 (13.1)*	2014
<b>Diabetes</b>				
Defined population with fasting glucose $\geq$ 126 mg/dl (7.0 mmol/l) or on medication for raised blood glucose (age-standardised) (%)	1.7 (9)*	1.0 (8)*	-	2014
Prevalence of diabetes (adults, 20–79 years old) (%)	-	-	2.5 (9.3) <sup>##</sup>	2019

CVD, cardiovascular disease; RHD, rheumatic heart disease; DALYs, disability-adjusted life years; AF, atrial fibrillation; SBP, systolic blood pressure; DBP, diastolic blood pressure; PA, physical activity; BMI, body mass index.

\*WHO; IHME Global data<sup>4,6</sup>

\*\*Okello, *et al.*<sup>7</sup>

<sup>†</sup>STEPS data<sup>9</sup>

<sup>##</sup>IDF Diabetes Atlas.<sup>13</sup>



**UGANDA – JULY 2020**

**Status of Cardiovascular Disease (CVD) and Non-communicable diseases (NCD)**

**Country Demographics**

**World Bank Classification**  
**Low income**

**76%**  
of population living in rural areas  
60% (Sub-Sahara Africa)



**UGANDA**

**17.8%**  
of total mortality caused by **RHD**  
Global data: 0.51%

**2.97%**  
Prevalence of rheumatic heart disease (**RHD**)  
Global data: 0.53%

**2%**  
of premature CVD mortality attributable to **tobacco**  
Global data: 10%

**16.8%** MALE **2.9%** FEMALE  
Prevalence of **tobacco use age ≥15**  
Global data: 36.1% (male) 6.8% (female)

**1.13%**  
of deaths caused by **hypertensive heart disease**  
Global data: 1.65%

**25.8%** MALE **22.9%** FEMALE  
of population with raised **blood pressure** (SBP ≥140 or DBP ≥90)  
Global data: 24.1% (male) 20.1% (female)

**4.6%**  
Prevalence of obese adults (BMI of ≥30 kg/m<sup>2</sup>)  
Global data: 13.1%

**9.85%**  
of **deaths** caused by CVD  
Global data: 31.8%

**6.7%**  
of population with raised total **cholesterol** (≥5.0 mmol/L)  
Global data: 38.9%

**2.5%**  
Prevalence of diabetes (**ages 20-79**)  
3.9% (Africa)



**UGANDA**

**Health System Capacity**



**1.7**

Number of physicians (per 10,000 population)



**12.4**

Number of nurses (per 10,000 population)



**5**

Number of hospital beds (per 10,000 population)

**KEY:**

No data



Not in place



In process/ partially implemented



In place



**Clinical Practice and Guidelines**

Locally-relevant (national or subnational level):

Clinical tool to assess CVD risk .....

Guidelines for treatment of tobacco dependence .....

**Clinical Guidelines for:**

The detection and management of atrial fibrillation .....

The detection and management of acute rheumatic fever .....

The detection and management of rheumatic heart disease .....

The detection and management of diabetes .....

CVD prevention (within the last 5 years) .....

A system to measure the quality of care provided to people who have suffered acute cardiac events .....

UGANDA

**Cardiovascular Disease Governance**

**A national strategy or plan that addresses:**

CVDs and their specific risk factors .....

NCD and their risk factors .....

Rheumatic heart disease prevention and control as a priority .....

A national surveillance system that includes CVDs and their risk factors .....

**Stakeholder action**

Non-governmental organizations' advocacy for CVD policies and programmes .....

Civil society involved in developing and implementing of national CVD prevention and control plan .....

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women.<sup>9</sup> In 2019, the prevalence of age-adjusted diabetes in adults 20–79 years was 2.5%, which is much lower than the global estimate of 9.3% or that for Africa (3.9%) (Table 1).<sup>13</sup>

## Part C: Clinical practice and guidelines

### Health system capacity

Uganda had an average of 1.7 physicians and 12.4 nurses per 10 000 of the population in 2017 and 2018, respectively, with five hospital beds per 10 000 people in 2010.<sup>4</sup>

Locally relevant clinical tools to assess CVD risk along with clinical CVD prevention guidelines are available through Uganda's health system capacity.<sup>14,15</sup> Clinical guidelines for the management of AF, pharyngitis, acute rheumatic fever (ARF) and RHD are also locally available.<sup>16</sup> The Mulago Hospital in Kampala was included in the REMEDY study, a prospective, international, multi-centre, hospital-based registry for RHD and rheumatic fever.<sup>17</sup> However, guidelines for treating tobacco dependence have not been fully developed. As in most African countries, no system is available to measure the quality of care provided to people who have suffered acute cardiac events. Uganda is one of the African countries with guidelines for diabetes.<sup>14,18</sup>

### Essential medicines and interventions

According to the WHO Global Health Observatory, five of the eight essential medicines were available at primary care facilities in the public health sector.<sup>4</sup> In Uganda's clinical guidelines, incorporating the Essential Medicines List released in 2016, six of these were available at different healthcare levels. These are angiotensin converting enzyme (ACE) inhibitors, aspirin,  $\beta$ -blockers, warfarin, metformin and insulin.<sup>16</sup> Statins and clopidogrel are not available at the primary healthcare level.<sup>16</sup> No data are available for CVD risk stratification or total cholesterol measurement at the primary healthcare level, and secondary prevention of ARF and RHD in public-sector health facilities.<sup>4</sup>

### Secondary prevention and management

Patients at high risk of AF, who were on treatment with oral anticoagulants, amounted to 10%. Those with a history of CVD taking aspirin, statin and at least one antihypertensive agent accounted for 0.05% (EO, pers commun). In a study by Musinguzi and Nuwaha in 2013, the percentage of hypertensive persons receiving medical treatment was 51.65%.<sup>19</sup> Of these, more men (62.2%) than women (48.7%) were receiving treatment.

## Part D Cardiovascular disease governance

A national strategic plan has been implemented to address CVD and NCD and their specific risk factors.<sup>20</sup> There is a dedicated budget within the NCD department<sup>4</sup> in the MoH in the process of being set up.<sup>20</sup> Although RHD prevention and control has not been prioritised in a national strategy or plan, the Uganda RHD advisory committee has been in discussions with the MoH.<sup>21</sup> National surveillance systems that include CVD and their risk factors are part of the NCD programme of the MoH.<sup>9,20</sup> A national

tobacco control plan has partially been developed, but no national multi-sectoral co-ordination mechanism for tobacco control exists.<sup>22</sup> Collaborative projects between the MoH and non-health ministries, for example the Uganda Bureau of Statistics, for CVD interventions have been established.<sup>20</sup> The percentage of total annual government expenditure on cardiovascular healthcare is unknown. However, the benefits of chronic care, which incorporate CVD prevention and control for population health and the economy have been modelled.<sup>23,24</sup>

### Assessment of policy response

No legislation mandating health financing for CVD exists, nor do court orders protecting patients' rights and those mandating improved CVD interventions, facilities, health system procedures or resources. Although limited, essential medicines are provided free of charge in the public sector in Uganda.<sup>25</sup> National legislation banning smoking in indoor public and workplaces, public transport, and other public places was published in the Gazette as was that mandating clear and visible warnings on tobacco packs.<sup>26</sup> Legislation banning all forms of tobacco advertising, promotion and sponsorship, and measures to protect tobacco control policies from tobacco industry interference also came into effect in 2015.<sup>26</sup> No other legislation or policies regarding CVD are available.

Taxes on unhealthy foods or sugar-sweetened beverages have been instituted, and the excise tax has been set at 200%,<sup>4</sup> while that of the final consumer price of tobacco products is 31%.<sup>27</sup> The percentage of excise tax of the final consumer price of alcohol products is 60%.<sup>28</sup> No legislation exists regarding banning the marketing of unhealthy foods to minors, or foods high in calories, sugar or saturated fats. Policy interventions promoting a diet that reduces CVD risk have also not been instituted. In July 2018, the MoH launched the first National Day of Physical Activity that would become an annual event.<sup>29</sup>

### Stakeholder action

Non-governmental organisations' advocacy for CVD policies and programmes are available, as is civil society's involvement in the development and implementation of a national tobacco control plan.<sup>30</sup> Civil society's involvement in the development and implementation of a national CVD prevention and control plan has also been documented.<sup>31,32</sup> Initiatives to engage with patient organisations in the advocacy for CVD/NCD prevention and management, along with advocacy champions or patient engagement groups for RHD have been mentioned,<sup>33</sup> such as the Uganda RHD patient-support group, hypertension patient group, and the diabetes patients' group.<sup>34</sup>

According to Dr Ann Akiteng,<sup>35</sup> multi-sectoral collaboration and partnerships for NCD/CVD are not well developed in Uganda but should receive attention. Specific activities by cardiology professional associations aimed at 25% reduction in premature CVD mortality rate by 2025 have been addressed by the Uganda Heart Association through the Uganda Heart Institute and annual activities such as World Heart Day celebrations.<sup>36</sup> Similarly, hypertension screening



takes place and to a certain extent at corporate health events, although screening at places of work has not officially been instituted.<sup>37</sup>

As part of the data collected for Uganda, a summary of the strengths, threats, weaknesses and priorities follows.

### Strengths

In 2014, the Uganda National NCD STEPS survey was conducted because of an increase in the prevalence of NCD, which were among the first 25 leading causes of DALYs.<sup>9</sup> These results led to the MoH introducing an annual National Day of Physical Activity in July, through hosting various activities such as stretching, dancing, netball and football, among other games, to curb NCD.<sup>29</sup> Since 1979, the Agency for Cooperation and Research in Development (ACORD) has been working in Uganda with non-governmental and grassroots organisations and communities to obtain social justice and sustainable development. ACORD assisted Uganda in developing the 2016–2020 Strategic Plan, which includes implementing NCD policies, of which CVD was one of the highest at 9%.<sup>30</sup>

The United States Agency for International Development (USAID) began the USAID Applying Science to Strengthen and Improve Systems (ASSIST) project to improve and strengthen health systems and social services in USAID-assisted countries.<sup>38</sup> In March 2016, they met in Dar es Salaam, Tanzania, with several representatives from these countries to discuss and share various ideas. Among the challenges in implementing strategies, policies or other mechanisms, stakeholder engagement, lack of understanding of key concepts, political will and champions, and sharing successes, were some of the topics discussed. Delegates agreed that a lack of general understanding of ‘quality policy and strategy’ and ‘governance of quality’ could pose a barrier to stakeholder engagement regarding policy formulation and implementation, as mentioned by a Ugandan representative. Along with a few other countries, such as Tanzania, Uganda shared positive experiences they had achieved through implementing quality improvement methodologies within their health systems at public facilities. Although NCD and CVD were not mentioned per se, one could assume that implementing any quality improvement process at the primary healthcare level would cover most services.<sup>38</sup>

In a study to develop sustainable acute and chronic cardiovascular care, a human-centred approach was used involving patient and provider input. Several positive outcomes emanated from this approach, such as the establishment of four integrated regional centres of excellence in RHD care with a national RHD registry.

### Threats

Researchers who analysed data from the 2014 WHO STEPS survey found a high prevalence of hypertension in Uganda, with only 7.7% of persons aware of their condition. This high burden of undiagnosed and uncontrolled high BP placed them at high risk of CVD and other related NCD.<sup>39</sup> In a more recent study, hypertension is still a threat, with more than one in four adults having raised BP, resulting in cases of

stroke, heart attack and heart failure as a cause of increased death rates.<sup>15</sup> Uganda’s three-year alcohol consumption is the highest of all the African countries under surveillance, at more than 12%, which possibly contributes to the hypertension burden.<sup>4</sup> Healthcare facilities were insufficiently equipped and services lacked integrated care.<sup>15</sup>

In a systematic review analysing epidemiological data on RHD prevalence and health systems in Uganda and Tanzania, the researchers found recurring complications, such as pulmonary hypertension and AF, along with the high RHD burden.<sup>40</sup> However, the identification of various barriers and facilitators provides an opportunity for implementing strategies to address the gaps in their health systems.<sup>40</sup>

### Weaknesses

Hypertension, affecting more than 25% of the adult population, is the most reported NCD in Uganda. The very low awareness and control of hypertension are an indication of the absence of a well-defined policy framework for preventing and managing this condition.<sup>19</sup> According to Dr Okello (pers commun), hypertension causes a lot of mortality directly and through complications, but unfortunately, most of the data are hospital-based.

In the report emanating from the ASSIST project meeting under the topic, political will and champions, quality improvement requires dedicated commitment through strategies and policy at all levels of the health system.<sup>38</sup> Therefore, with regard to the quality of care, it was suggested that Uganda could make use of more champions at a national and sub-national level.<sup>38</sup> Regardless of the launch of an NCD prevention and control programme in 2008, some NCD services were established at different levels of care, which were fragmented within the MoH.<sup>35</sup>

Uganda’s exceptionally high RHD prevalence is based on a prospective cohort study done in Kampala.<sup>7</sup> Limitations of this study, which could have influenced these results are documented in the published article.<sup>7</sup> Therefore, these data might not be representative of national data.

### Priorities

To prevent disability and death and improve the quality of life of persons at risk for developing NCD, preventing CVD risk factors and providing effective and affordable treatment should receive high priority.<sup>15</sup> Furthermore, the health profiles of people with intermediate- and high-risk factors for CVD need improvement at the community and health facility level.<sup>15</sup>

Funding for NCD, as in most African countries, remains problematic and with the ever-growing epidemic, needs to receive urgent attention. Almost all of Uganda’s NCD funding comes from the World Diabetes Federation, which is not sustainable. Attention should also be given to cost-effectiveness and availability of resources when evaluating integrated prevention and care models. According to Schwartz *et al.*,<sup>31</sup> stronger governance and a robust civil society are needed to ensure that policies are developed and implemented. The co-operation and determination of multiple sectors, including a supportive civil society, will ensure a successful NCD agenda.<sup>31</sup> An urgent need for the

decentralisation of CVD services is needed because of the high RHD case detection rates.<sup>33</sup>

This publication was reviewed by the PASCAR governing council and approved by the president of the Uganda Heart Association.

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# Zambia Country Report

## PASCAR and WHF Cardiovascular Diseases Scorecard project

Fastone Goma, Wihan Scholtz, Oana Scarlatescu, George Nel, Jean M Fourie

### Abstract

Data collected for the World Heart Federation's Scorecard project regarding the current state of cardiovascular disease prevention, control and management, along with related non-communicable diseases in Zambia are presented. Furthermore, the strengths, threats, weaknesses and priorities identified from these data are highlighted in concurrence with related sections in the attached infographic. Information was collected using open-source datasets available online and relevant government publications.

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On behalf of the World Heart Federation (WHF), the Pan-African Society of Cardiology (PASCAR) co-ordinated data collection and reporting for the country-level Cardiovascular Diseases Scorecard for Africa.<sup>1,2</sup> The Zambia Heart and Stroke Foundation (ZAHESFO), a member of the WHF and PASCAR collaborator, assisted the team in collating and verifying these data. In this report, we review strengths, threats, weaknesses and priorities identified from the collected data, along with needs to be considered in conjunction with the associated sections provided in the accompanying infographic. Datasets that were used included open-source data from the World Bank, the World Health Organization (WHO), Institute for Health Metrics and Evaluation, the International Diabetes Federation and several government publications.

### Part A: Demographics

According to the World Bank (2018), Zambia is a lower-middle-income country with 56% of its people living in rural

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areas.<sup>3</sup> In 2015, 57.5% of the population were living below the US\$1.9-a-day ratio. Life expectancy at birth in 2018 was 61 and 66 years for men and women, respectively. The general government health expenditure was 1.73% of the gross domestic product (GDP) in 2017, while the country's GDP per capita was US\$1539.9 in 2018.<sup>4</sup>

### Part B: National cardiovascular disease epidemic

#### The national burden of cardiovascular disease (CVD) and non-communicable diseases (NCD) risk factors

In comparison to the neighbouring countries, Tanzania and Mozambique, Zambia's premature deaths attributable to CVD (30–70 years old) is 2% higher, at 10%.<sup>5</sup> In 2017, the age-standardised total CVD death rate was 10.3%, which is lower than the global rate of 31.8%.<sup>6</sup> The percentage of disability-adjusted life years (DALYs) resulting from CVD was 4.18%, with the prevalence of atrial fibrillation (AF) and atrial flutter at 0.1%.<sup>6</sup> The prevalence of rheumatic heart disease (RHD) was 0.98%, while the total RHD mortality rate was 0.14% of all deaths (Table 1).<sup>6</sup>

#### Tobacco and alcohol

The prevalence of tobacco use in adult men 15 years and older was 26.5% in 2015, which, in 2017, was found to be 24% in 18–69-year-old respondents in the WHO STEPwise approach to surveillance (STEPS).<sup>4,7</sup> In 2015, only 4.6% of adult women used tobacco, while of those who participated in STEPS, 7.8% was using tobacco.<sup>4,7</sup> The smoking prevalence among adolescents aged 13–15 years was 24.9% for boys and 25.8% for girls.<sup>4</sup> Country data available for the estimated annual direct cost of tobacco use indicated approximately US\$200.<sup>8</sup> The premature CVD mortality rate attributable to tobacco is 4% of the total mortality rate, which is lower than the global 10%.<sup>9</sup> The three-year (2016–18) average recorded alcohol consumption per capita (≥ 15 years old) was 3.9 litres (Table 1).<sup>4</sup>

#### Raised blood pressure and cholesterol

In 2015, the percentage of men and women 25 years and older with raised blood pressure (BP) levels (systolic BP ≥ 140 mmHg or diastolic BP ≥ 90 mmHg) was 27.6 and 26.5%, respectively.<sup>4</sup> STEPS data, conversely, revealed 19.1% of Zambians had raised BP or were on medication in 2017 (Table 1).<sup>7</sup> The percentage of DALYs lost because of hypertension was 2.32%, whereas the mortality rate caused by

hypertensive heart disease was 0.93% in 2017 (Table 1).<sup>6</sup> The estimated age-standardised raised total cholesterol level (TC,  $\geq 5.0$  mmol/l) was 27.7% in 2008,<sup>4</sup> while in 2017, Zambians aged 18–69 years old had a prevalence of only 7.4% (Table 1).<sup>7</sup>

### Physical activity

In 2016, the percentage of adolescents 11–17 years old who were insufficiently active [ $< 60$  minutes of moderate- to vigorous-intensity physical activity (PA) daily] was 89.3%.<sup>10</sup> For adults, the age-standardised prevalence was 22.1% of those who were insufficiently active ( $< 150$  minutes of moderate-intensity PA per week or  $< 75$  minutes of vigorous-intensity PA per week) in the same year (Table 1).<sup>4</sup>

### Overweight and obesity

The prevalence of overweight [body mass index (BMI)  $\geq 25$  to  $< 30$  kg/m<sup>2</sup>] and obesity (BMI  $\geq 30$  kg/m<sup>2</sup>) in adults 25 years and older was 27.8 and 8.1%, respectively in 2016.<sup>4</sup> On

the other hand, of the STEPS respondents, 13.2% of men and 20.2% of women were overweight, while far more women (12.3%) than men (3%) were found to be obese (Table 1).<sup>7</sup>

### Diabetes

The percentage of the defined population with a fasting glucose level  $\geq 7.0$  mmol/l or on medication for raised blood glucose (age-standardised) in 2014 was 6.5% for men and 6.7% for women.<sup>4</sup> In 2019, the prevalence of age-adjusted (adults 20–79 years) diabetes was 4.5%, which is lower than the global estimate of 9.3% but higher than that of Africa's 3.9% (Table 1).<sup>11</sup>

## Part C: Clinical practice and guidelines

### Health system capacity

Zambia had an average of 11.9 physicians and 13.4 nurses per 10 000 of the population in 2018, and 20 hospital beds

Table 1. Cardiovascular disease indicators for Zambia

Indicators	Male	Female	Total	Year
<b>Status of the national CVD epidemic</b>				
Premature CVD mortality (30–70 years old) (% deaths)	-	-	10	2012
Total CVD mortality (% of deaths)	9.8	10.9	10.3 (31.8)*	2017
DALYs attributable to CVD (%)	4.29	4.04	4.18 (14.7)*	2017
AF and atrial flutter (%)	0.12	0.09	0.1 (.5)*	2017
Total RHD mortality (% of deaths)	0.12	0.16	0.14 (.5)*	2017
Prevalence of RHD (%)	0.88	1.09	0.98 (.5)*	2017
<b>Tobacco and alcohol</b>				
Prevalence of adult tobacco use (18–69 years old) (%) <sup>†</sup>	24.0 (36.1)**	7.8 (6.8)**	-	2017
Prevalence of youth (13–15-year-olds) tobacco use (%)	24.9 (18.2)**	25.8 (8.3)**	-	2011
Estimated direct (healthcare-related) cost of tobacco use in your population (in current US\$)			200 m	2019
Proportion of premature CVD mortality attributable to tobacco (%)	-	-	4 (10)**	2004
Recorded alcohol consumption per capita ( $\geq 15$ years) (litres of pure alcohol) (three-year average)			3.9	2016–18
<b>Raised blood pressure and cholesterol</b>				
Population with raised BP (SBP $\geq 140$ mmHg or DBP $\geq 90$ mmHg) (18–69 years old) (%) <sup>†</sup>	20.5 (24.1)**	17.6 (20.1)**	19.1 (22.1)**	2017
Population with raised TC ( $\geq 5.0$ mmol/l) (18–69 years old) (%) <sup>†</sup>	4.5	9.3	7.4 (38.9)**	2017
DALYs attributable to hypertension (%)	2.01	2.7	2.32 (8.7)*	2017
Mortality caused by hypertensive heart disease (% of deaths)	0.63	1.33	0.93 (1.7)*	2017
<b>Physical activity</b>				
Adolescents (11–17 years old) who are insufficiently active ( $< 60$ minutes of moderate- to vigorous-intensity PA daily) (%)	89.4	89.1	89.3 (80.7)**	2016
Adults (age-standardised estimate) who are insufficiently active ( $< 150$ minutes of moderate-intensity PA per week, or $< 75$ minutes of vigorous-intensity PA per week) (%)	19.1	25.0	22.1 (27.5)**	2016
<b>Overweight and obesity (Adults 18–69 years old)</b>				
Prevalence of overweight (BMI $\geq 25$ – $< 30$ kg/m <sup>2</sup> ) (%) <sup>†</sup>	13.2	20.2	16.7 (38.9)**	2017
Prevalence of obesity (BMI $\geq 30$ kg/m <sup>2</sup> ) (%) <sup>†</sup>	3.0	12.3	7.5 (13.1)**	2017
<b>Diabetes</b>				
Defined population with fasting glucose $\geq 126$ mg/dl (7.0 mmol/l) or on medication for raised blood glucose (age-standardised) (%)	6.5 (9)**	6.7 (8)**	-	2014
Prevalence of diabetes (20–79 years old) (%)	-	-	4.5 (9.3) <sup>#</sup>	2019

CVD, cardiovascular disease; DALYs, disability-adjusted life years; AF, atrial fibrillation; RHD, rheumatic heart disease; SBP, systolic blood pressure; DBP, diastolic blood pressure; TC, total cholesterol; PA, physical activity; BMI, body mass index.

\*IHME Global Health data exchange<sup>6</sup>

\*\*WHO global data<sup>4</sup>

<sup>†</sup>STEPS data<sup>7</sup>

<sup>#</sup>IDF Diabetes Atlas.<sup>11</sup>

per 10 000 people in 2010.<sup>4</sup> A locally developed clinical tool was adapted from the WHO Essential Non-Communicable Disease tool (WHO PEN) to measure NCD management at healthcare facilities.<sup>12</sup> Locally relevant clinical guidelines for CVD prevention (within the last five years) have also been published.<sup>13</sup> No guidelines for the treatment of tobacco dependence are available or locally relevant (national or sub-national) clinical guidelines for the detection and management of AF. However, clinical guidelines have been developed to manage pharyngitis, acute rheumatic fever (ARF) and RHD.<sup>14</sup> Zambia was one of the lower-middle-income countries to participate in the REMEDY study that reported a hospital-based registry for RHD and rheumatic fever.<sup>15,16</sup> However, there is no system to measure the quality of care provided to people who have suffered acute cardiac events. Regarding the detection and management of diabetes, Zambia does have guidelines in place.<sup>17</sup>

### Essential medicines and interventions

Angiotensin converting enzyme (ACE) inhibitors, aspirin,  $\beta$ -blockers and metformin are included in the list for essential medicines at primary care facilities in the public health sector,<sup>4</sup> while insulin was available in 42% of the health centres.<sup>18</sup> However, statins, warfarin and clopidogrel are not available at healthcare centres. No data were available for CVD risk stratification or TC measurement at the primary healthcare level, and secondary prevention of ARF and RHD in public-sector health facilities.

### Secondary prevention and management

No data are available on high-risk patients with AF who were being treated with oral anticoagulants, or those with a history of CVD taking aspirin, statin and at least one antihypertensive agent. In a study by Oelke *et al.*,<sup>19</sup> it was noted that of those participants who had ever been told they had hypertension, 76.7% received medication. In another study looking at hypertension management in rural clinics, of the patient visits, 21.1% had an antihypertensive medication prescribed.<sup>20</sup>

## Part D: Cardiovascular disease governance

Zambia's National Health Strategic Plan (NHSP) 2017–2021 addresses NCD, which includes CVD as one of the top 10 causes of mortality over the five years, 2011 to 2015.<sup>21</sup> Although an operational non-communicable diseases unit in the ministry of health (MoH) is responsible for NCD,<sup>22</sup> no budget has been dedicated to CVD.<sup>23</sup> An RHD ongoing control programme, BeatRHD Zambia, established in 2012, addresses and prioritises the problem in Zambia.<sup>14,24</sup> Furthermore, a national surveillance system that includes CVD and their risk factors has been implemented by the MoH.<sup>7</sup>

Zambia has introduced a comprehensive national multi-sectoral tobacco co-ordination and control plan through the WHO framework convention on control (FCTC).<sup>25</sup> Collaborative projects between the MoH and non-health ministries for CVD interventions have been mentioned.<sup>26</sup> However, government expenditure specifically allocated to

CVD healthcare is not known to have been reported. As part of the WHO-CHOICE project, the benefits of CVD prevention and control for population health and the economy have been modelled.<sup>27,28</sup>

### Assessment of policy response

No legislation exists that mandates health financing for CVD. The Southern African Development Community adopted a 'procurement co-operation' strategy to procure essential medicines at affordable prices, including those for CVD.<sup>29</sup> The MoH manages procurement through the procurement unit, however, it could not be established how many and which of these medicines were below the international benchmark of affordable prices.<sup>29</sup> No court orders protecting patients' rights and mandating improved CVD interventions, facilities, health system procedures or resources are available.

Legislation banning smoking in indoor work and public places has been introduced as has that protecting against tobacco industry interference.<sup>25</sup> However, tobacco advertising, promotion and sponsorship, and clear visible warnings on more than half the packaging have not been legalised.<sup>25</sup>

Policies ensuring equitable nationwide access to healthcare professionals and facilities have been implemented.<sup>30</sup> Although screening for CVD risk factors have been reported in a few studies, there is no policy ensuring that of high-risk CVD individuals. No sustainable funding for CVD so-called 'sin' taxes has been noted. Excise tax on unhealthy foods or sugar-sweetened beverages was also not instituted,<sup>31</sup> while that on the final consumer price of tobacco was 25%,<sup>25</sup> and that of alcohol products reported being more than 10%.<sup>32</sup>

No legislation is available banning the marketing of unhealthy foods to minors or mandating clear and visible warnings on unhealthy foods. Although policy interventions promoting a diet to reduce CVD risk have been mentioned, appropriate programmes and policies have yet to be developed to protect the most vulnerable peoples in the country.<sup>33,34</sup> Zambia does not have any policy interventions that facilitate PA.

### Stakeholder action

In 2017, advocacy for CVD policies and programmes by non-governmental organisations such as the Diabetic Association of Zambia and ZAHESFO were addressed.<sup>13</sup> Involvement of patient organisations in CVD/NCD prevention and management advocacy has been reported along with that for RHD by advocacy champions.<sup>35</sup> Civil society involvement in the development and implementation of a national tobacco control plan was also reported.<sup>25</sup> Similarly, civil society involvement in the national multi-sectoral co-ordination mechanism for NCD/CVD was mentioned in the Seventh National Development Plan and National Assembly of Zambia in 2017.<sup>36,37</sup> Activities by cardiology professional associations to reduce the burden of premature CVD by 25% in 2025 are in progress.<sup>13</sup> Hypertension screening by businesses at workplaces was suggested, and a repeated call was made in 2019 to curb the high prevalence.<sup>38,39</sup>


The following strengths, weaknesses, threats and priorities are summarised, as part of the data gathered for Zambia.

**ZAMBIA – JULY 2020**



**Status of Cardiovascular Disease (CVD) and Non-communicable diseases (NCD)**

**Country Demographics**


**World Bank Classification**  
**Lower-middle income**



**56%**  
of population living in rural areas  
60% (Sub-Sahara Africa)

**0.14%**  
of total mortality caused by **RHD**  
Global data: 0.51%

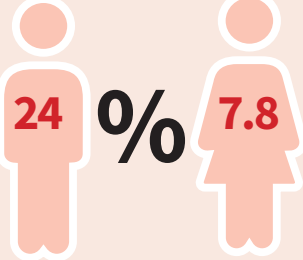



**0.98%**  
Prevalence of rheumatic heart disease (**RHD**)  
Global data: 0.53%



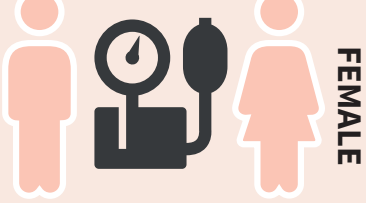
**4%**  
of premature CVD mortality attributable to **tobacco**  
Global data: 10%

**24%** MALE **7.8%** FEMALE  
Prevalence of **tobacco use age ≥15**  
Global data: 36.1% (male) 6.8% (female)

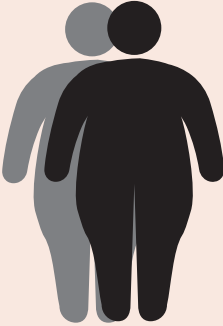



**0.93%**  
of deaths caused by **hypertensive heart disease**  
Global data: 1.65%


**20.5%** MALE **17.6%** FEMALE  
of population with raised **blood pressure** (SBP ≥140 or DBP ≥90)  
Global data: 24.1% (male) 20.1% (female)



**7.5%**



Prevalence of obese adults (BMI of ≥30 kg/m<sup>2</sup>)  
Global data: 13.1%



**10.28%**  
of **deaths** caused by CVD  
Global data: 31.8%

**7.4%**



of population with raised total **cholesterol** (≥5.0 mmol/L)  
Global data: 38.9%



**4.5%**  
Prevalence of diabetes (**ages 20-79**)  
3.9% (Africa)

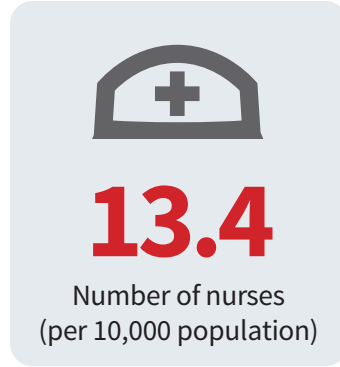
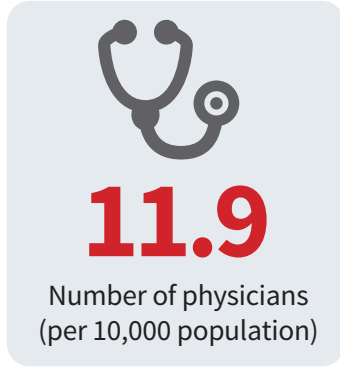
**ZAMBIA**





**ZAMBIA**

**Health System Capacity**



**KEY:**

No data



Not in place



In process/ partially implemented



In place



**Clinical Practice and Guidelines**

Locally-relevant (national or subnational level):

Clinical tool to assess CVD risk .....

Guidelines for treatment of tobacco dependence .....

**Clinical Guidelines for:**

The detection and management of atrial fibrillation .....

The detection and management of acute rheumatic fever .....

The detection and management of rheumatic heart disease .....

The detection and management of diabetes .....

CVD prevention (within the last 5 years) .....

A system to measure the quality of care provided to people who have suffered acute cardiac events .....

ZAMBIA

**Cardiovascular Disease Governance**

**A national strategy or plan that addresses:**

CVDs and their specific risk factors .....

NCD and their risk factors .....

Rheumatic heart disease prevention and control as a priority .....

A national surveillance system that includes CVDs and their risk factors .....

**Stakeholder action**

Non-governmental organizations' advocacy for CVD policies and programmes .....

Civil society involved in developing and implementing of national CVD prevention and control plan .....

For more information, please email [info@worldheart.org](mailto:info@worldheart.org) [info@pascar.org](mailto:info@pascar.org)

## Strengths

Considering various sources, the data from STEPS 2017 were regarded most accurate to be included in this report.<sup>7</sup> The NHSP of 2017, along with the Seventh National Development Plan, identified strategies and programmes that should contribute to a healthy nation, ensuring all Zambians have access to quality health services by 2030.<sup>21,36</sup> In a communique, the government is committed to establish and strengthen multi-sectoral plans and policies to prevent and control NCD in the Zambian population.<sup>40,41</sup>

A comprehensive national multi-sectoral tobacco co-ordination and control plan has been introduced through the WHO FCTC, although it does not include the banning of advertising, promotion and sponsorship or clear, visible warnings on more than 50% of the packaging.<sup>25</sup>

May Measurement Month (MMM), a global initiative that was introduced in 2017 to raise awareness of raised BP in sub-Saharan African countries has opened opportunities for workplace screening of hypertension and related CVD risk factors.<sup>39</sup>

## Threats

As in most sub-Saharan African countries, the burden of NCD, which is related to risky lifestyle behaviour and consequent morbidity and mortality is increasing in Zambia.<sup>21</sup> The increasing burden of premature mortality from NCD is a cause for concern, especially since after saving the young from dying prematurely from communicable diseases, they die prematurely from NCD.

Tobacco use among Zambian adolescents is higher than in most other African countries under investigation, especially in females and calls for urgent intervention (Table 1).

As mentioned, overweight and obesity tend to be a problem in most African countries, although in Zambia, these figures are lower than the global data at 38.9 and 13.1%, respectively.<sup>7</sup> Another reason for concern is the high percentage of young people who are insufficiently physically active.<sup>4</sup>

## Weaknesses

Health services in Zambia are fragmented and unevenly distributed, with the result of them being inefficient and ineffective. Therefore, many rural and peri-urban residents have inadequate access to healthcare services.<sup>30</sup> In a study on hypertension management in rural primary health facilities, similar findings were reported.<sup>20</sup>

The inconsistent supply of essential medicines is a crucial problem in Zambia, which is attributed to various factors, particularly inadequate funding and difficulties with procurement, distribution logistics, and storage management, among other things.<sup>30</sup>

## Priorities

According to Chiluba *et al.*,<sup>38</sup> many opportunities exist for developing interventions for optimal screening, treatment and prevention of CVD in Zambia. Oelke *et al.*,<sup>19</sup> in 2015, suggested initiatives to increase access to health education to reduce the risk of developing hypertension, improve early

detection, and encourage lifestyle changes and medication adherence. In another study, facilitating regular and systematic data reviews to improve hypertension diagnosis and management, shifting the focus on performance indicator development and validation in low-resource contexts had been recommended.<sup>20</sup> Policy makers need to engage with communities more effectively to develop successful public health strategies to prevent, detect and manage hypertension, primarily in rural areas.<sup>19</sup>

In 2018, the committee on health, community development and social services of the National Assembly of Zambia published their findings in a Report with about 23 recommendations addressing NCD.<sup>37</sup> Some of these advise the government to:

- prioritise the prevention and control of NCD through more robust community sensitisation and awareness
- invest as a matter of urgency in capacity building of human resources, especially in cardiac surgery, endocrinology and cardiology, among other areas
- undertake routine screening for sugar levels as for BP measurement at all health facilities
- put in place measures to strengthen health systems in the country to help prevent and control NCD through primary healthcare and universal health coverage, in line with the WHO Global NCD Action Plan 2013–2020.<sup>42</sup>

This publication was reviewed by the PASCAR governing council and approved by the president of ZAHESFO.

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