

# 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.

### 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>

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