

# Uganda Country Report

## PASCAR and WHF Cardiovascular Diseases Scorecard project

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### 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 (≥ 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.  
<sup>\*</sup>WHO; IHME Global data<sup>4,6</sup>  
<sup>\*\*</sup>Okello, *et al.*<sup>7</sup>  
<sup>†</sup>STEPS data<sup>9</sup>  
<sup>#</sup>IDF Diabetes Atlas.<sup>13</sup>

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>

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