

Policy Brief

Policy Process to manage NCDs Risk Factors at the East African Community



Credit: Rwanda Car Free Day (The President of the Republic of Rwanda & the first lady gracing the Breast Cancer Awareness walk)

Background

According to WHO, 41 million deaths are attributed to NCDs, equivalent to 74% of deaths globally of which an approximated 643,500 plus deaths are from the East African region. Each year, 17 million people die from NCDs before the age of 70 and 86% of these are premature deaths. Of all deaths, 77% are from low- and middle-income countries that all the East African member states are apart. The four main groups of diseases include cancer, diabetes, chronic respiratory diseases, and cardiovascular diseases accounting for 80% of premature deaths.

The risk factors can be classified into modifiable and non-modifiable which can have changeable or non-changeable conditions. The modifiable risk factor includes high blood pressure, smoking, physical inactivity, obesity, high blood cholesterol, climate, and diabetes mellitus which contains all the behavioral and metabolic risk factors whereas the unmodifiable risk factors include age, gender, genes, ethnicity, and race. The key responses are early detection, screening, treatment, and palliative care.

The policy brief reviewed existing literature, published in medical journals, World Health Organization Reports, NCDs global reports, the EAC website, and other relevant reports and referenceable data about NCDs risk factors.

Defining NCD Risk factors & Geographical Introduction of East Africa.

NCDs refer to a wide group of non-infectious conditions characterized by the long-term requirement for treatment and care. These conditions include cancers, cardiovascular disease, diabetes, and chronic respiratory disease. The East

African Community (EAC) is home to an estimated 283.7 million people with 30% living within the urban areas of the region, and a GDP of US \$ 305.3 billion. Within the region, NCDs were estimated to cause 40% of the deaths and were projected to overtake other communicable diseases as the leading causes of death. The unprecedented growth in the EAC region and increasing urban population due to global economic growth and changes in environmental factors leading to the decline of infectious diseases that are prominent in rural populations due to the variation of gene expressions are driving the NCDs epidemic. The changes in gene expression were attributed to a combination of lifestyle, geography, and biotic factors that easily relate to the risk factors of NCDs.

Risk factors of Non-Communicable Diseases

The risk factors can be categorized into five broad categories to be mutually exclusive and collectively exhaustive of the co-occurrences of behaviors and characteristics by an individual or society to cause NCDs. However, few or no studies in Sub-Saharan Africa relate to most of the sub-components for the risks of NCDs. Other country studies can be referenced to provide insight into the same for benchmarking purposes. The five broad NCDs risk categories include;

1. Environmental factors.

- a) **Climate Change.** Climate change may increase the risk of cardiovascular disease (CVD) directly through air pollution and extreme temperatures and indirectly through changes in dietary options. Exposure to air pollutants due to pollution concentrates, anthropogenic emissions, natural sources of air pollutants, and distribution and types of airborne allergens. The pollutants include carbon

monoxide, lead, nitrogen, sulfur dioxide, ozone, and others have been reported to increase hospitalization and mortality due to CVD. Changing climate leads to increasing temperatures that affect the respiratory system due to ozone exposure which leads to increased respiratory tract irritation, chronic pulmonary disease, and lung disease mortality. In 2030, the low and middle-income class countries will record more deaths, and the evolving climatic changes in the East African region and various exposures make this critical to combat the NCDs epidemic.

- b) **Toxic material exposure.** The NCDs and the novel zoonoses (toxic-related) are linked with the new problems of food safety that may arise from the environmental-feed-food chain and toxic exposures of feed for food-producing animals. One of the common toxic exposures is related to mycotoxins. Mycotoxins are toxic secondary metabolites of fungal origin that contaminate common agricultural products and feeds before or under post-harvest. Globally, 24-50% of foodstuffs produced are contaminated with mycotoxins. Metabolites are ingestible through the consumption of meat and eggs but are highly common in wheat, rice, beans, cocoa, grapevine, wines, fruits, nuts, spices, and dried foods. Most of these are East African delicacies and their ease of ingestion through food, risks exposing the community to NCDs. Though toxicity depends on the type of toxin, dose, frequency of exposure, sex, and age, they have caused 3000 deaths in Africa. Other effects include malnutrition, stunted growth, reduced liver function, derangement of the blood clotting mechanism, jaundice, and reduced synthesis of proteins in the liver, risking exposure to NCDs.

2. Socio-Demographic factors.

- a) **Age.** Though NCDs are associated with older populations, it's worth noting that 15 million deaths were from people aged between 30 to 69 years and more than 82% of these were premature deaths. New risks of NCDs appear at early ages due to the consumption of unhealthy foods and drinks that later develop into catastrophic NCDs when children grow into adults.
- b) **Gender.** Women and men have varying exposure and vulnerability to NCDs risk factors. Women are more likely to be obese due to less or no physical activity characteristics that increase the risk of diabetes. Globally, 48% of men smoke which exposes them to chronic respiratory diseases like lung cancer, unlike

12% of women. Men and women manifest NCDs' signs and symptoms differently.

- c) **Race & Ethnicity.** The concepts of race and ethnicity play a centrifugal role in understanding disparities in health and healthcare. Due to the variation in prevalence, it's worth noting that race & ethnicity though not wholly does have an impact on the risk of exposure to any of the NCDs. In South Africa, another study pointed out that racial and ethnic variations are critical for players when implementing NCDs activities because of the relatedness to economic inequality, nutrition, and lifestyle. In multicultural states, the less economically empowered ethnicities are at risk of living with NCDs.
- d) **Education.** The highly educated usually earn more and because they have more disposable income, they are likely to dine out which enables them to consume more energy and fat which is linked to hyperlipidemia. However, though cancer and heart disease weren't related to the education variable from a study, diabetes & stroke among men and women and hypertension among women were likely to occur for individuals with a lower level of education. The risk of getting diabetes, stroke, and hypertension was linked to having unstable jobs that usually expose individuals to heavy alcohol consumption, smoking, eating cheaper unhealthy diets, and mental health due to the stresses of survival.
- e) **Income.** The World's poorest are usually less likely to afford basic diagnosis and treatment due to the direct and indirect costs that come with access to NCD services in the region. It is driving premature deaths within low- and middle-income countries.

3. Genetic factors.

- a) **Family disease history.** A longitudinal study in the USA showed that individuals with a family history of diabetes, cancer, or heart disease were at risk of NCDs. 30 – 50% of screened healthy individuals with a first-degree relative with diabetes had an 11% chance of contracting the disease and another study showed that 34% of healthy individuals were at a high or moderate risk of getting cancer. So, first and second-degree relatives had a high risk of contracting any of the NCDs depending on the family history.
- b) **Genetic inheritance.** Diseases like cancer were highly heritable by about 62% besides other diseases like cardiovascular disease at 12.3%, diabetes at 10.9%, obesity at 3.7%, hypertension at 2.8%, chronic lung dysfunction at 1.6%, metabolic syndrome at 0.4%, and

other NCDs at 6.3%. Investigations that target chronic disease variants provide better opportunities for screening, diagnosis, and early effective intervention. Dietary recommendations cognizant of gene expressions also help align micro and macronutrient intake to an individual's body makeup. The use of simple approaches that use genetic knowledge has been successful in single-gene disorders and presents a potential for success in NCD genetic-based interventions

c) **Epigenetic changes.** The interaction between genetics, lifestyle, and environment is evidenced to drive the NCDs epidemic. The role of the epigenome in the etiology (causes) of NCDs, and insights into epigenetic mechanisms may offer opportunities to predict, detect and prevent disease long before its clinical onset. Epigenetic alterations result through several mechanisms that may include; chromatin modification, DNA methylation, and controlling gene expressions by non-coding RNAs. Though little research exists within Sub-Saharan Africa on the same, studies on gene expressions may be useful in the prediction and control of the NCD epidemic.

d) **Radioactive material exposure.** Patients that received medical support through radiation either considering the radiation dosimetry or not were at higher risk or had increased mortality risk from Ischaemic (reduced blood flow) heart disease and cerebrovascular disease. Though the studies didn't consider the factors like age, heart size, gender, or patient anatomy, the linkage between radiation and the risks of NCDs is worth noting. In the EAC, most specialty cancer clinics use the radiation option to treat patients, but most times the impacts of this treatment option have been registered to increase contracting other NCDs or resulting in heart failure or stroke. Also, exposure to radiation in manufacturing plants, mines, and other occupational exposures leads to cancers and chronic respiratory failure.

4. Self-management factors.

a) **Physical inactivity.** WHO recommends 150 minutes of moderate-intensity activity or 60 minutes of high-intensity activity to reduce the risks of NCDs morbidity and mortality worldwide. Physically active people live longer and are less likely to suffer from diabetes, heart disease, and cancer. Moderate-intensity physical activity includes activities like brisk walking, dancing, and doing household chores while High-intensity physical activity entails activities like running, biking, swimming, carrying heavy loads, and cycling.

Table 1: Media Time spent on physical activity

Country	Time (minutes)	Level
32 countries in Africa	116	Average
Mozambique	386	Highest
Tanzania	330	
Zanzibar	188.6	
DRC	80	
Mauritania	21	Lowest

Source: https://www.afro.who.int/sites/default/files/2017-06/15264_who_afr_situation-ncds-15-12-2016-for-web_0.pdf

Table 2: Physical Activity Time by Gender

Gender	Time (minutes)
Females	90
Males	149

Source: https://www.afro.who.int/sites/default/files/2017-06/15264_who_afr_situation-ncds-15-12-2016-for-web_0.pdf

In the EAC, DRC had the highest prevalence rate of physically inactive adults at 44.1, Zanzibar stood at 17.6 and Tanzania had one of the least prevalence rates of 7.5. The low physical activity intertwined with the urban lifestyle indicates a looming public health crisis that needs urgent attention.

b) **Tobacco use.** It's worth noting that of the 1 billion tobacco users, 80% are from low- and middle-income class countries. The global effect is 70% of lung cancer, 40% of chronic lung disease, and 10% of cardiovascular disease. Adult males tend to smoke 10 times more than. In these EAC states, 5.1 to 7.4 cigarettes were smoked per day though females in Tanzania smoked 6.7 per day and males smoked 4.9. The average smoking debut age was 23 years in DRC and 21 years in Tanzania and Zanzibar. The prevalence was 14.1 for Tanzania 7.3 for Zanzibar. The prevalence rates for males exceed 10% for all 2 EAC states signifying the public health threat.

c) **Alcohol consumption.** Globally, alcohol takes the lives of 2.5 million people annually and though it affects every organ in the body, its particular impact on the liver is life-threatening as it results in many chronic health disorders. One of the public health solutions is abstinence and Niger had the highest rate of 99% while Seychelles was at 8% for adult males. DRC stood at 58.4% with 67.2 females and males at 44.8% and the United Republic of Tanzania stood at 62.4% with 70.1% females and 54.4% males abstaining from alcohol which can be attributed to their cultural beliefs and religious affiliations. An analysis of children aged 13-15 in 13 countries showed that 14.6% of children in Kenya and 12.6% in Uganda reported having used alcohol one or more times in the last 30 days. It led to troubles like problems with family and friends, school absenteeism, and

violence with a median of 19% across the 13 countries including Uganda and Kenya, and the highest in Zambia at 47% and Senegal at 5%. Though the rates were low generally, the growing influence of alcohol across the region and the prevalence of heavy episodic drinking is very high and youngsters are likely to learn about *alcohol through advertising and marketing strategies of the alcohol industry.*

- d) **Unhealthy diets.** The insufficient consumption of fruits and vegetables accounts for 14% of deaths from gastrointestinal cancer and 10% from Ischemic heart disease. Though other regions experience the greatest consequences, malnutrition and consumption of unhealthy diets are double burdens in the African continent.

The median consumption of fruits and vegetables across the African continent was 2.8 days. In the EAC, DRC, and Tanzania consumed fruits for 2.5 days in a week while Zanzibar within the region had the highest at 3.9 days per week for countries with reported data. The consumption of vegetables was slightly high across all countries in the African continent with a median of 4.2 days per week. In the EAC, Tanzania had the highest consumption patterns of 4.5 days per week and with DRC at 3.9 days per week whereas Zanzibar was at 2.8 days per week. *The recommended 5 servings of fruits and vegetable combinations per day weren't found across the continent indicating a need for increased public health awareness.*

5. Factors from medical conditions.

- a) **Medications.** Besides, other factors contribute to poor control status in patient with NCDs which includes lack of integrated care at the health system level, poor adherence to self-care recommendations, and compliance with medications. Medication nonadherence is one of the common and potential modifiable causes of inadequate control of NCDs. In simple terms, medical nonadherence is when patients don't take their medications as prescribed. It's common among patients with chronic illnesses that can be due to factors like cost, fear, misunderstanding, too many medications, lack of symptoms, mistrust, worry, and depression. Most premature deaths are a result of non-adherence within the East African region. Good adherence to medications is essential to achieve better control status of patients with NCDs.
- b) **Viruses & other infections.** The largest burden of infection-associated NCDs was gastric cancer due to helicobacter pylori (a type of

bacteria that affects the stomach), cirrhosis and other chronic liver diseases due to Hepatitis B and hepatitis C, rheumatic heart disease due to streptococcal infection and cervical cancer due to HPV. In Sub-Saharan Africa, the proportion of crude NCD burden attributable to infectious causes was 11.7%, higher than the burden from common risk factors like alcohol use, dietary risks, air pollution, and others. Signifying a need to ensure the availability, coverage, and quality of cost-effective interventions on key infectious diseases from viruses, and other infections.

- c) **Mental Illness.** The prevalence of mental disorders is elevated in people who live with non-communicable diseases especially multiple chronic conditions compared with those that have no NCDs. The comorbidity of mental health and NCDs has a profound impact on individuals with effects like poor glycemic control for diabetic patients and inadequate blood pressure control for patients with hypertension. Globally, 540 million people suffer from mental health challenges and 75% of these are from low- and middle-income class countries of which only 20% are reported to have access to mental healthcare.

Gaps limiting the effective management of NCDs risk factors in the East African region.

The risk factors of managing NCDs are commonly associated with the self-management factors category. Below are some of the main gaps realized from the research;

- a) **Lack of knowledge about the broader NCDs risk factor categories.** A great percentage of practitioners, medical experts, and policymakers within the region have little to no knowledge of the broader NCDs risk factor categories. As one section believes dietary consumption is the main challenge, and another thinks climate change is driving the NCDs pandemic yet it's a combination or mix of one or more of these risk factors.
- b) **Distributed implementation of efforts.** The national & regional environmental teams are implementing efforts to combat the environmental challenges as the medical expert are focused on health-related challenges yet the NCDs problem requires a combination of efforts from various departments, ministries, organizations, and teams.
- c) **No East African Community NCDs targets.** The EAC is estimated to experience 40% of deaths attributable to NCDs yet no targets exist to

combat the growing epidemic. The absence of a clear roadmap makes the various prevention and control efforts ununiform which makes it difficult to tell if they are delivering for the benefit of the entire region.

Proposed solutions for the East African Community

1. Regional Level

- a) **Develop policies, frameworks, and guidelines that merge all efforts around the region.** The EAC and governments have siloed policies and efforts with each performing its functions independently. The creation of unique and integrated guidelines that bring efforts together will help to drive prevention & control efforts across the region.
- b) **Clear advocacy agenda incorporating all the NCDs risk categories.** An advocacy agenda that engages people living with NCDs, the public, policymakers, leaders, and civil society in a problem-solution approach with clear goals, and a unique combination of resources will help to drive awareness and actions across the region.
- c) **Set East African Community NCDs targets.** Globally, leaders come together to set targets for health, education, environmental, and other social needs. The more inclined leaders are to set targets and have a vision, the more likely they are to achieve their targets that will help if aspects like NCDs prevention and care are inclusive of the long-term health goals.

2. Country Level

- a) **Multi-sectoral collaboration.** Recently, the UN Interagency task force on NCDs awarded the **Rwanda NCD alliance** for enabling and supporting multi-sectoral collaboration within the country and the **Ministry of Health in Uganda** for driving progress on alcohol control through partnerships and multisectoral collaboration. The progress at the country level is noteworthy, but these efforts need to continue and engage as many partners as possible to have a firm force against NCDs across the region.
- b) **National Commitment to curb NCDs.** The need for political will from the local, regional, and national leaders from each country will also contribute significantly as they will earmark funds, allocate them and utilize them in various efforts to curb the rising burden.

3. Community Level like CSO, Businesses, & others

- a) **Offer healthy foods.** Organizations, schools, and businesses always share food with their beneficiaries, students & teachers, and employees and customers on one or more occasions. The objective should be, for every gathering where food is on the agenda, should have a healthy balance of fruits and vegetables to drive the preventive approaches across at this level.
- b) **Offer physical activity spaces & fruit and vegetable gardens in schools or communities.** Workplaces will benefit from having spaces for physical activity like gyms, yoga classes, and others and schools and communities can have fruit and vegetable gardens to serve their students, and teachers and communities can access these fruits at affordable rates.

4. Individual Level

- a) **Live a healthy lifestyle.** Any individuals within the East African community will benefit from living a healthy lifestyle through the consumption of fruits & vegetables, staying physically active, consuming less alcohol, and avoiding tobacco use.
- b) **Seek & follow medical advice.** Any individual within the region would benefit from understanding their genetic makeup and following the medical advice from practitioners on how to leave better and adhering to the key consumption patterns needed to stay healthy. For PLWNCDs, adherence to medical prescriptions is key to reducing complicated consequences that may wipe out one's savings due to emergency treatment and hospitalizations.
- c) **Practice climate change strategies at an individual level.** Proper disposal of waste and management of natural habitats like forests, swamps, and others will help reduce the impacts of climate change in the region.

Conclusion

With these recommendations and approaches, its worth noting that the fight against NCDs is critical to combat the rising burden. Given the complex interplay of risk factors like genetic environmental factors and lifestyle compounded by social economic disparities, NCDs disproportionately affect the poor. Therefore, governments and leaders should create pro-poor programs that create awareness, ease access and provide support for the lowest-income earners in society. That way, we are optimistic that the goal of ending NCDs by 2030 is achievable.

References

- Budreviciute A, Damiati S, Sabir DK, Onder K, Schuller-Goetzburg P, Plakys G, Katileviciute A, Khoja S and Kodzius R (2020) Management and Prevention Strategies for Non-Communicable Diseases (NCDs) and Their Risk Factors. *Front. Public Health* 8:574111. Doi: 10.3389/fpubh.2020.774111 <https://www.frontiersin.org/articles/10.3389/fpubh.2020.774111/full> (Accessed on 20 September 2022)
- Peters R, Ee N, Peters J, Beckett N, Booth A, Rockwood K, Anstey KJ. Common risk factors for major noncommunicable disease, a systematic overview of reviews and commentary: the implied potential for targeted risk reduction. *Ther Adv Chronic Dis.* 2019 Oct 15;10:2040622319880392. doi: 10.1177/2040622319880392. PMID: 31662837; PMCID: PMC6794648. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6794648/> (Accesses on 20 September 2022)
- Bickler SW, Wang A, Amin S, Halbach J, Lizardo R, Cauvi DM, De Maio A. Urbanization in Sub-Saharan Africa: Declining Rates of Chronic and Recurrent Infection and Their Possible Role in the Origins of Non-communicable Diseases. *World J Surg.* 2018 Jun;42(6):1617-1628. doi: 10.1007/s00268-017-4389-5. PMID: 29234849; PMCID: PMC5935558. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5935558/>
- PAHO Fact Sheet (2012), Non-Communicable Diseases and Gender, <https://www.paho.org/hq/dmdocuments/2012/PAHO-Factsheet-Gender-English.pdf> (Accessed on 21 September 2022)
- TY - CHAPAU -By Tenkorang, Eric, PY - 2018/07/26, SP - 156, EP - 175, SN - 9781351805353, T1 - Racial and ethnic differences in non-communicable diseases in South Africa, DO - 10.4324/9781315209005-9, https://www.researchgate.net/publication/326631474_Racial_and_ethnic_differences_in_non-communicable_diseases_in_South_Africa
- Spanakis EK, Golden SH. Race/ethnic difference in diabetes and diabetic complications. *Curr Diab Rep.* 2013 Dec;13(6):814-23. doi: 10.1007/s11892-013-0421-9. PMID: 24037313; PMCID: PMC3830901. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3830901/>
- Oshio, T., Kan, M. Educational level as a predictor of the incidences of non-communicable diseases among middle-aged Japanese: a hazards-model analysis. *BMC Public Health* 19, 852 (2019). <https://doi.org/10.1186/s12889-019-7182-6>
- Family History as a Predictor for Disease Risk in Healthy Individuals: A Cross-Sectional Study in Slovenia, Klemenc-Ketis Z, Peterlin B (2013) Family History as a Predictor for Disease Risk in Healthy Individuals: A Cross-Sectional Study in Slovenia. *PLOS ONE* 8(11): e80333. <https://doi.org/10.1371/journal.pone.0080333>
- Jamaluddine, Z., Sibai, A.M., Othman, S. et al. Mapping genetic research in non-communicable disease publications in selected Arab countries: first step towards a guided research agenda. *Health Res Policy Sys* 14, 81 (2016). <https://doi.org/10.1186/s12961-016-0153-9>
- Tabatabaiefarm M.A., Sajjadi, R.S., Narrei, S. (2019). Epigenetics and Commons Non-communicable disease. In: Kelishadi, R. (eds) *Primordial Prevention of Non-Communicable Disease. Advances in Experimental Medicine and Biology*, vol 1121. Springer, Cham. https://doi.org/10.1007/978-3-030-10616-4_2
- Ladeira C, Frazzoli C, Orisakwe OE. Engaging One Health for Non-Communicable Diseases in Africa: Perspective for Mycotoxins. *Front Public Health.* 2017 Oct 16;5:266. doi: 10.3389/fpubh.2017.00266. PMID: 29085817; PMCID: PMC5650707.
- Soile Tapio, Mark P. Little, Jan Christian Kaiser, Nathalie Impens, Nobuyuki Hamada, Alexandros G. Georgakilas, David Simar, Sisko Salomaa, Ionizing radiation-induced circulatory and metabolic diseases, *Environment International*, Volume 146, 2021, 106235, ISSN 0160-4120, <https://doi.org/10.1016/j.envint.2020.106235>
- WHO, (2015), Report on the status of major health risk factors for Non-Communicable Diseases: WHO Africa Region, https://www.afro.who.int/sites/default/files/2017-06/15264_who_afr-situation-ncds-15-12-2016-for-web_0.pdf (Accessed on October 25 2022)
- Yuvaraj K, Gokul S, Sivaranjini K, Manikandanesan S, Murali S, Surendran G, Majella MG, Kumar SG. Prevalence of medication adherence and its associated factors among patients with noncommunicable disease in rural Puducherry, South India - A facility-based cross-sectional study. *J Family Med Prim Care.* 2019 Feb; 8 (2):701-705. doi: 10.4103/jfmpc.jfmpc_350_18. PMID: 30984698; PMCID: PMC6436260.
- American Medical Association, (2020), 8 reasons patients don't take their medications: Patient Support and Advocacy, <https://www.ama-assn.org/delivering-care/patient-support-advocacy/8-reasons-patients-dont-take-their-medications> (Accesses on October 28 2022)
- Vikram P. & Somnath C., Integrating Mental Health In Care For Noncommunicable Diseases: An Imperative For Person-Centered Care, *Non-Communicable Diseases: The Growing burden Health Affairs.* 2015 Sept; Vol 39, No. 9. <https://www.healthaffairs.org/doi/10.1377/hlthaff.2015.0791> (Accessed on October 28 2022)
- Coates MM, Kintu A, Gupta N, Wroe EB, Adler AJ, Kwan GF, Park PH, Rajbhandari R, Byrne AL, Casey DC, Bukhman G. Burden of non-communicable diseases from infectious causes in 2017: a modelling study. *Lancet Glob Health.* 2020 Dec;8(12):e1489-e1498. doi: 10.1016/S2214-109X(20)30358-2. Epub 2020 Oct 21. PMID: 33098769; PMCID: PMC8040338.
- Medicien Sans Frontiers, Displaced and distressed: people's mental health in East Africa. <https://www.msf.org/displaced-and-distressed-people%E2%80%99s-mental-health-east-africa> (Accessed on October 28 2022)
- WHO, (2022), 2022 United Nations Inter-agency Task force on NCDs and the WHO Special Programme on Primary Healthcare Awards: World Health Organization <https://www.who.int/news/item/21-09-2022-2022-united-nations-inter-agency> (Accessed on October 28 2022)