



The United Republic of Tanzania
Ministry of Health



THE NATIONAL NON-COMMUNICABLE DISEASES
PREVENTION AND CONTROL PROGRAM

NATIONAL NON-COMMUNICABLE DISEASES RESEARCH AGENDA

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WORLD **DIABETES** FOUNDATION





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List of Abbreviations

AI	Artificial Intelligence
AIDS	Acquired Immunodeficiency Syndrome
CHW	Community Health Workers
DM	Diabetes Mellitus
HBV	Hepatitis B Virus
HCW	Health Care Workers
HIV	Human Immunodeficiency Syndrome
HPV	Human Papilloma Virus
HSSP V	Health Sector Strategic Plan V
LMIC	Low- and Middle-Income Countries.
MoH	Ministry of Health
NCDs	Non-Communicable Diseases.
NHIF	National Health Insurance Fund.
NHRA	National Health Research Agenda
PHC	Primary Health Care
PORALG	President's Office, Regional Administration and Local Government
TB	Tuberculosis
TFNC	Tanzania Food and Nutrition Centre
WHO	World Health Organization



Preface

The burden of NCDs and associated complications is sharply rising in most low- and middle-income countries (LMICs) and, Tanzania is no exception. To date, NCDs alone account for over 70% of reported deaths globally, and over 50% of life losses (disability adjusted life years (DALYs)) result from disabilities due to NCDs and injuries. NCDs have impacted individuals' and national' economies and significantly disrupted the existing health systems which is already overburdened by other health problems including infectious diseases, maternal and child health challenges, and nutritional disorders. Tanzania has also experienced such sharp increase and this is jeopardizing efforts to universal health coverage, equitable services, and promoting good health of Tanzanians

Tanzania has made commendable progress in the fight against NCDs. This includes developing a national NCDs control and prevention program, and developing and revising National NCDs strategies and other related policies. Furthermore, remarkable achievements have been attained in enhancing the allocation of resources to address stagnating NCDs services.

Implementation, health system, basic and clinical research is required to address the implementation gaps, challenges, and best practices to improve preventive, curative, and rehabilitative efforts for NCDs. Such efforts need be streamlined to critical challenges and needs that the country is facing. To this end therefore, the National NCDs Program under the Ministry of Health (MoH) in collaboration with private and public research and academic institutions, health facilities and other stakeholders initiated the process for developing the NCDs Research Agenda aiming to address the mentioned needs.

The agenda described in this document provides a framework for researchers in Tanzania and collaborators on key national priority areas for NCDs research. The Ministry believes that all NCDs related government plans, policies, strategies and activities will be informed by the findings from research addressing this agenda.

A handwritten signature in blue ink, appearing to read 'Abel Makubi'.

Prof. Abel Makubi,
Permanent Secretary (Ministry of Health)



Foreword

The government of Tanzania is dedicated to improving her citizens' health by developing and providing quality services, policies and strategies which are informed by local research on NCDs. The government has signed, agreed and is committed to adhering to internationally set targets such as sustainable development target number 3.4 and the Global Action Plan to Prevent and Control NCDs, 2013-2030. These are all geared towards reducing the rising burden of NCDs through increasing financial investments, equitable resource allocation, development and enforcement of policies and guidelines that promote and advocate for measures to control for NCDs risk factors, and, ensure equitable distribution and provision of adequate care and treatment.

In keeping with other developing countries, Tanzania is also facing a rapid rise in the burden of NCDs that have overwhelming pressure on health system which is already burdened by common communicable diseases like HIV/AIDS, Malaria and TB. NCDs now account for a third of the overall disease burden in the country. For instance, whereas the disability, morbidity and mortality due to most communicable diseases between 2009/2019 have been decreasing, the burden due to NCDs particularly stroke, ischaemic heart disease and cirrhosis have been increasing (IHME, 2019). Existing evidence have shown that, nutrition transition is partially responsible for the existing situation in addition to inadequate preparedness of our health system in addressing the double burden of diseases (Mathur and Shah, 2011; WHO Regional Office for Africa, 2015).

The existence of National NCDs Control and Prevention Program, National Strategy on Prevention and Control of NCDs, policies and strategies related to curbing these diseases have not been adequate in keeping these conditions at bay. Moreover, research that are conducted in Tanzania on NCDs are still scanty and, as the country we have been lacking a set national NCDs research agenda that would show and guide scientists on research priority areas. As a result, most initiatives are only to some extent informed by local research.

The MoH through the NCDs Prevention and Control Program initiated the process of developing the National NCDs Research Agenda. The initiative is aimed to address



contemporary challenges of unsatisfactory NCDs services and activities, and, in promoting engagement on NCDs research that address national priorities.

This agenda was developed through consultative workshops that involved various NCDs stakeholders including policy makers, scientists, health care workers, implementing and development partners from different organizations. The team gathered and analysed evidences from local and global research in conducting situational analysis and hence, develop NCDs research themes, highlighting existing gaps in addressing the burden to NCDs and finally, propose potential research areas.

The government believes that, scientists, policy makers and other stakeholder will make the best use of this document to provide the government with information necessary to tackle the burden of NCDs in the country.

A handwritten signature in black ink, appearing to read 'Aifello Wedson Sichwale'.

**Dr. Aifello Wedson Sichwale,
Chief Medical Officer.**



Acknowledgement

The National NCDs research agenda is a product of dedicated efforts by different individuals who worked tirelessly to gather and translate available evidence to show the prevailing strengths and weakness in addressing the burden NCDs while simultaneously indicating potential research areas.

In a special way, the MoH wishes to extend its sincere appreciation to the following individuals (table 1) for their exemplary leadership and dedication in developing this important document. Special thanks also go to all individuals whose scientific works assisted in conducting situational analysis in order to understand the gaps and develop the research areas.

Table 1; Individuals who participated in the development of National NCDs Research Agenda

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Background

As observed in other low- and middle-income countries (LMICs), Tanzania is experiencing an increasing burden of NCDs and associated morbidity and mortality. In the recent decades, NCDs have contributed to unacceptable high rates of disabilities, morbidity, and mortality while inflicting tremendous economic losses to families and countries. These diseases have been responsible for at least 40 million deaths each year globally, and of which 16 million are premature deaths (Bennett et al., 2018; Ganju et al., 2020).

Most countries in the world have observed an increase in the trend of NCDs, although the highest burden is in LMICs which experience over 80% of the global burden and associated premature mortality. Furthermore, the situation is dire in these countries owing to their health systems which have long been weakened by the persisting and relatively high burden of communicable diseases such as HIV/AIDS, Malaria and TB (WHO GCM/NCD Working Group, 2017; Budreviciute *et al.*, 2020).

As part of multifaceted causes and risk factors to this epidemiological transition, most of the heavily affected parts of the world including Tanzania have witnessed dramatic demographic, economic, and nutrition transition. Such ongoing changes have resulted into an increased ageing population, changes in working styles, sedentary lifestyles, feeding and nutrition patterns resulting into less physical activities and overweight and obesity. Such attributes are not felt evenly throughout the regions or across the populations, calling for further efforts in determining the best practices to deal with the complexity of the situation (Budreviciute *et al.*, 2020; Ganju *et al.*, 2020)

Different sectors contribute to population's exposure to these risk factors. For instance, contribution of food industries to junky foods, and the role of tobacco industries to increased supply of cigarette. Thus, attaining the control and prevention of NCDs is beyond the reach of health sectors alone. Recent evidence have identified loopholes in national and global policies, regulatory frameworks and strategies that regrettably have greatly contributed and fuelled the propagations of these drivers to nutrition transition and NCDs risk factors, and



hence, the growing burden of NCDs (Galambos and Sturchio, 2012; Ganju *et al.*, 2020; Renshaw *et al.*, 2020)

Four NCDs namely, cardiovascular diseases, diabetes mellitus (DM), respiratory diseases and cancers account mainly for the overall burden of NCDs globally and nationally and together are associated with huge economic losses than any other single disease entity (Bennett *et al.*, 2018; WHO Evaluation Office, 2020; Ministry of Health and Social Welfare, 2015). Current projections have shown that, if burden of these four conditions is not addressed promptly and appropriately, cumulative global economic losses from 2011 to 2025 will reach US\$ 51 trillion and in LMICs will be responsible for nearly US\$ 7 trillion. In the LMIC countries, only US\$ 170 billion would be needed to curb the burden of these diseases in the same period which would result into saving significant amount for the improvement of health overall or channelled to other developmental projects (Budreviciute *et al.*, 2020)

Having realized that, the global community through the head of states in different United Nations High Level Meetings and other regional and international platforms agreed to make NCDs a priority by setting a number of targets that are to be attained by these countries mainly in 2025 and/or 2030. The sustainable goal 3.4 requires all countries to ensure that, the NCDs premature deaths is reduced by one third in 2030 and there is improvement in mental health and overall wellbeing. Furthermore, through the Global Action Plan for Prevention and Control of NCDs, the heads of states agreed to implement the set global indicators on NCDs against which their performance would be assessed (WHO GCM/NCD Working Group, 2017; Renshaw *et al.*, 2020)

Most countries particularly LMIC, are far from realizing these targets. Unfortunately, there is growing evidence that shows increasing trends of these diseases in these countries that without appropriate approaches, their burden in 2030 could be far bigger than the current estimates (Ministry of Health and Social Welfare, 2015; WHO GCM/NCD Working Group, 2017; Ganju *et al.*, 2020).



Owing to disparities in economy levels, the distribution and the burden of risk factors and their related diseases, it is important for countries to consider revising and/or developing new policies, regulations, strategies and guidelines that are informed by local research. This will assist to; rationally mobilizing resources, securing sustainable innovative financing schemes for NCDs and establishing transparent and effective intersectoral governance structure. Furthermore, it will help to efficiently utilize and expand domestic resources to implement national NCDs responses and, establishing sustainable structures to ensure coherence of enacted plans and regulatory frameworks across different sectors

Objectives

Tanzania launched the national strategic plan for NCDs and, the National NCDs Control and Prevention program which are coordinated centrally at the MoH. The program and other units that implement various NCDs related activities have been developing strategies and policies that owing to the rapid disease epidemiological changes, it is worth to do revisions on the existing strategies and policies, and new ones to be developed by being benchmarked on locally conducted research.

The intention of this document is therefore to:

- i. Identify research areas of priority to the country which were formulated based on existing gaps on regulatory frameworks and nature of NCDs services that are provided in the country. These services are grouped into; preventive, screening, diagnostic, treatment and rehabilitative services.
- ii. Provide critical analysis on issues pertinent to implementation/administration of NCDs related services and activities so as to inform strategies for improvement.
- iii. Scientists are usually engaged in different research. This document serves to guide scientists to focus on areas of national interests.



Rationale

In order to produce the evidence base for selecting and implementing NCDs programmes and policies in Tanzania, investments are needed. These investments should be guided by a national research agenda for the prevention and control of NCDs in Tanzania. The national research agenda for NCDs in Tanzania will shed light on priority areas that could be refined and then adopted by government agencies, the private sector, non-governmental and community-based organisations.

The research agenda provides series of research areas which are focused on identifying interventions that strengthen the six blocks of the healthcare systems including models of care and improved access to NCDs screening, innovative NCDs financing, diagnosis and treatment, determining the impact of government policies, assessing the effectiveness of prevention programmes (e.g. tobacco, environmental improvements), and testing research tools and resources to monitor NCDs at the population level.

The rational use of this agenda is vital to effectively address the growing burden of NCDs. The document provides relevant authorities with country's level data on the burden of NCDs, factors associated, reliability of the regulatory frameworks and, the quality and appropriateness of health systems in addressing this growing burden of NCDs.



Stakeholders

The NCDs research agenda is meant to be utilized by different local and international stakeholders in increasing their understanding of the Tanzania's research context that should be considered for: funding and, conducting basic, health system, clinical and implementation research.

Stakeholders are categorized into different groups based on the potential utility of this document:

1. Transformation of NCDs services and activities require the collaboration of different sectors. This research agenda can therefore be relied on by stakeholders from different sectors in identifying and implementing strategies that are geared to address cross-cutting issues on NCDs.
2. The Ministry of Health (MoH) and policy makers through critical approach to the existing gaps, can develop suitable solutions and their corresponding performance indicators that will monitor and evaluate their execution.
3. Scientists will be guided on research areas which are of national interests through which, they can assist to inform policies, practice and strategies through their research findings.
4. To local and international development partners and organizations, the document is useful in selecting areas for considerations for funding that could be offered in form of grants that can support both basic and implementation research and/or provision of services.



Organization of National NCDs Research Agenda

Following critical evaluation by the team appointed by the MoH of the available evidence pertinent to the control and prevention of non-communicable diseases, the final version of this National Research Agenda was organized into six themes. For each subtheme, extensive analysis of gaps and potential research areas was conducted based on situational analysis.

The endorsed themes included:

1. Burden of NCDs
2. Risk factors for NCDs
3. Enabling environment
4. Health systems
5. Innovative and implementation research for NCDs
6. Multisectoral approach in addressing NCDs and their related comorbidities.



The Burden of NCDs

Background

Globally, the burden of NCDs has sharply risen for the past few decades. These diseases have become the leading causes of disability, morbidity and mortality. In 2016 alone, NCDs accounted for approximately 41 million deaths globally out of the reported 56.9 million deaths (71%). Surprisingly, 1.7 million deaths occurred among individuals aged less than 30 years. Diabetes mellitus, cancers, cardiovascular diseases and respiratory diseases accounted for 80% of these deaths (WHO, 2000; Mæstad, 2006; Budreviciute *et al.*, 2020; WHO Evaluation Office, 2020).

In the same year, premature mortality (i.e., deaths among people aged 30-69 years) accounted for over one third of all NCDs related deaths. Most of the NCDs cases and deaths are reported in LMIC which are already burdened by prevailing communicable diseases such as HIV/AIDS, Malaria and TB. Furthermore, 85% of all reported premature deaths due to NCDs also arose from the LMIC (WHO, 2000).

The situation in Tanzania is similar to what is observed in other LMICs, with nearly one third of all deaths due to NCDs (Ministry of Health and Social Welfare, 2015). With regard to prevalence, most cases of NCDs are accounted for by hypertension (25.9%) and diabetes (9.1%) (Ministry of Health and Social Welfare, 2013).

Historically, communicable diseases had been the most prevalent diseases in the country resulting in resources being skewed in fighting these diseases. This notion is no longer tenable since with the rapid increase in prevalence of NCDs there has been subsequent higher costs, morbidity and mortality rates. Deliberate measures and efforts need to be dedicated in addressing the double burden of diseases (Ministry of Health and Social Welfare, 2013).

The burden of NCD is increasing due to what has been termed the nutritional transition, with large consumption of highly refined and processed foods, foods rich in saturated fats, sugar and salt and increasing sedentary lifestyle. This transition is driven by issues such as trade,



foreign investments and urbanisation. These can lead to economic development but are also the main factors leading to increase in unhealthy behaviours and thereby increased risk of NCDs (Budreviciute *et al.*, 2020).

The most common diseases that drive the NCDs epidemic in Tanzania include; cardiovascular diseases, cancer, diabetes, chronic respiratory disease, oral diseases, mental illnesses and substance abuse, accidents and injuries (Ministry of Health and Social Welfare, 2015). Tanzania is among resource constrained countries with health systems already weakened by then most prevalent conditions such as HIV/AIDs, Malaria, maternal and child health, and TB. The overwhelming increase of burden of NCDs on the prevailing health systems further drain the available resources, put tremendous pressure on individual and national economy (Mæstad, 2006; Ministry of Health and Social Welfare, 2019). The situation calls for evidence-based strategies to inform policies, practice and allocation of resources.

Establishment of the burden of NCDs rely on effective surveillance system and, understanding and the correct use of these data is necessary for effective resource allocation, priority setting, formulation of policies and strategies and monitoring the NCDs program performance.

Gaps

Tanzania is among countries to have passed and agreed to the set global target, SDG 3.4. This is in an effort to improve health conditions of its people by reducing the burden of premature deaths due to NCDs by at least one third in 2030, and at the same time improve mental health and well-being.

With the current trend of NCDs in the country, this target is far from being realized given the existence and persistence of a number of gaps in the health systems. These includes; inadequate knowledge of both the public and health care personnel, poor referral systems, lack of services integration, inadequate and in accessible social protection systems, uneven distribution of services, lack of surveillance systems, lack of harmonized policies and



strategies etc. These factors should be addressed promptly to relieve the growing pressure on the health system, huge economic burden on the individuals as well as the country.

Research Areas

Diagnosis and referral systems

Important research areas include; strategies to identify cost-effective, acceptable and feasible interventions to increase the uptake of screening services for NCDs; effective tools to estimate and monitor the trends of morbidity and mortality rates associated with NCDs; developing and deploying locally appropriate diagnostic algorithms for NCDs, their related comorbidities and complications; effective strategies for integration of community health workers (CHW) in detection and referring cases of NCDs.

Other areas; locally appropriate and effective investments on telemedicine to support diagnosis; interventions to enhance the capacity of HCWs at primary health care (PHC) levels in diagnosing NCDs. Policy and strategy revisions to enhance the efficiency of existing referral systems are the additional yet important research areas.

Treatment and Rehabilitation

Priority research areas for consideration include; evaluating and improving the capacities of health facilities in administering different treatment options for NCDs; understanding of, improving and ensuring sustainable and effective supply chains of NCDs related medical equipment and consumables; establish and enhance the availability, affordability and accessibility of NCDs treatment and rehabilitative services; integration of NCDs and communicable diseases services; engaging and integrating rehabilitation services at all levels of care.

Further research areas; studying approaches for linkage and integration of various treatment services at health facilities; approaches to understand how to improve the efficiency of existing strategies for continuity (within health facilities and from facilities to



the community) of care for NCDs; quantifying how to enhance the sustainability of the referral systems; studying how to improve the coverage and integration of existing social protection systems; identifying the factors associated with poor adherence and retention to NCDs care and treatment.

Other research areas important to consider; short- and long-term outcomes of NCDs, NCDs comorbidities and their related treatment; determinants (including genetics) of NCDs progression/prognosis and their response to treatment; feasibility for developing effective and cheap drugs and equipment to improve the quality of NCDs services; exploring the utility of alternative medicines in management of NCDs; effective and efficient mechanisms to enhance the transition from poly-pills treatment to combination therapies.

Emphasis should also be made on the following; cost analysis of NCDs burden, complications and services; analysing and improving the effectiveness of existing multi-stakeholders engagement and/or identifying and establishing new multi-stakeholders engagement approaches; evaluate and improve the quality of NCDs services among vulnerable population e.g., refugees, prisoners; leveraging on existing human and physical infrastructure to increase the access to quality NCDs services; evaluate existing policies and legislation on equitable distribution of NCD services and; establish effective and sustainable surveillance systems for NCDs.

Attention on the following areas is of paramount importance as well; feasibility of using comprehensive and sustainable databases for NCDs for prioritization, planning, resource allocation and research; innovative strategies for disseminating NCDs burden related information to different stakeholders; existing various genotypes and phenotypes of NCDs; quality and sustainability of the existing patients' registries.



Risk Factors for NCDs

Background

Most developing countries, including Tanzania, have been battling with most prevalent communicable diseases including HIV, Malaria and TB. Owing to globalization and its associated rapid evolving nutrition transition, these countries are now experiencing a rapid changing diseases epidemiology with NCDs becoming the most prevalent conditions that account for most of reported morbidity, mortality and disabilities (Budreviciute *et al.*, 2020; Ganju *et al.*, 2020).

Behind the current epidemiology of NCDs is the increasing prevalence of risk factors, distribution of which vary across ages, socioeconomic status and sexes. Surprisingly though, the prevalence of these risk factors and their related NCDs is also rapidly increasing in children and young adults contrary to the situation in the past (WHO Regional Office for Africa, 2015).

NCDs are a result of complex interactions between human genetics (unmodifiable), modifiable personal attributes/lifestyles and the environmental risk factors. The latter group particularly, personal attributes account significantly for most of these diseases after they are gradually accumulated over long period of time. They include physical activity, tobacco use, alcohol consumption, diet, weight and dental health which are the main focus of global and national NCDs prevention advocacy (Budreviciute *et al.*, 2020; Tesema *et al.*, 2021).

In Africa WHO region, the prevalence of risk factors for NCDs were found high both in adults and children. Among adults, the median prevalence of smoking and alcohol consumption was 12% (5-26%) and 21% (0.3-87%) respectively. Among children the media prevalence for smoking and alcohol consumption was 7% (3-17%) and 31% (1-69%), the latter surprisingly being higher in children than in adults (WHO Regional Office for Africa, 2015).



Studies on adherence to recommended physical activity, consumption of healthy diets and, maintenance of appropriate body mass index (BMI) showed disappointing results both in children and adults. For example, studies have suggested that up to 15% of adults in urban settings are physically inactive, 97.2% of adults eat less than 5 servings of fruit and/or vegetables on average per day, and there is high prevalence of overweight and obesity (26%), raised cholesterol (26%), and raised triglycerides (33.8%) among adults. In addition, the prevalence of behavioural risk factors is also unacceptably high; one study showed prevalence of current tobacco use was 15.9%, and that for current alcohol drinking was 29.3% (WHO Regional Office for Africa, 2015).

Although child undernutrition is decreasing steadily, maternal micronutrient deficiencies are still high and pose a great risk for NCDs to the child and the mother especially when coupled with maternal overweight and obesity. Studies have shown that malnutrition in the mother and in children play a significant role on premature onset of NCDs, such as diabetes mellitus, hypertension and high blood cholesterol levels and obesity. In addition, road traffic accidents and gender violence are pressing issues that exposes many individuals to risk of NCDs such as mental disorders and disability. Peer influence is another factor that affects adolescent and youth into various NCDs. Also, climate change may result into pollution hence play a significant role in the risk NCD (WHO Regional Office for Africa, 2015).

The increased prevalence of risk factors to NCDs are a result of both changing life style and societies' living conditions which their control require a close collaboration between affected individuals and the society at large. For instance, cigarette companies and beverage industries ensure availability of tobacco products and alcoholic drinks respectively, the consumption of which increases the risk for NCDs. To control the use of these products, the target population must work with the stakeholders for these industries (WHO GCM/NCD Working Group, 2017; Renshaw *et al.*, 2020; WHO Evaluation Office, 2020).

Other important risk factors but often not paid attention to are environmental factors including the climatic changes, air pollution etc that account for most of cardiopulmonary diseases (Budreviciute *et al.*, 2020).



Addressing the burden of these numerous and diverse risk factors require concerted efforts by individuals at risks and sectors beyond health that have a role to play in influencing the presence of some of these factors. As such, research to inform policies and strategies in addressing these factors are warranted. for instance, main risk factors for NCD are related to poor diet and physical inactivity. Addressing these risk factors effectively has been estimated to prevent 80% of coronary heart disease, up to 90% of diabetes type 2 and one third of cancers and is therefore key in NCD strategy.

Gaps

Several measures including awareness campaigns, school-based programs etc., have been used to advocate measures to curb this burden however, the persistence increase of disease burden indicates gaps that are to be addressed appropriately. Historically, many NCDs have been directly linked to economic growth and were called “diseases of the rich.” Now, the burden of NCDs in developing countries has increased. Until 2012, information about the burden and risk factors for NCDs in Tanzania were based on cross-sectional surveys conducted in limited geographical areas and comprehensive nationally representative data is lacking. . In addition, there is paucity of quality data on NCD-related co-morbidities. Design of effective preventive interventions requires accurate information to help identify major risk factors and their distribution in the country. Such knowledge can also help to identify populations to target interventions and in the design of research studies to evaluate the impact of interventions implemented as part of the national NCDs program.

Research Areas

Some of research areas worthy consideration include: drivers and distribution of contributors to the epidemic of NCDs including different NCDs phenotypes and genotypes; understanding the role of genetic predisposition to development of NCDs including mental illnesses; role of genetic engineering in era of NCDs epidemic; life course studies in understanding NCDs risk factors, contribution of communicable diseases (eg HIV and TB) in NCDs epidemic and how they influence NCDs treatment outcomes. Importantly, to explore



the feasibility of leveraging on lessons learnt in HIV/TB programs in addressing the risk factors for NCDs.

Understanding risk of poor treatment outcomes across different populations (eg children, adults, alcoholics etc), use of technology (artificial intelligence) in quantifying and projecting the risks to develop NCDs; comprehensive analysis of policies and regulations that guide the use of harmful products; influence of policies, regulations and laws in advocacy of healthy lifestyle and physical activity; short and long-term impacts of economic policies and strategies e.g., industrialization on the burden of risk factors for NCDs.

Further areas; community risk perceptions and preparedness in addressing the NCDs risk factors; leveraging on globalization to control risk factors; acceptable and cost-effective interventions to promote healthy lifestyle and physical activity; association of foetal/maternal conditions with future risks for NCDs; feasibility of introducing taxation schemes on products such as tobacco and alcohol; cost-effective, efficient and acceptable strategies to enhance the uptake and scaling up of vaccination programs particularly on HPV and HBV.

Research focus should also be made on; determinants and prevalence of substance use; establishing acceptable, participatory and sustainable platforms for disseminating awareness and knowledge on risk factors; establishing new and enhancing the effectiveness and efficiency of the existing NCDs related policy, laws and regulations enforcing measures; feasible strategies to engage the government and various stakeholders in enforcing laws and policies, and promoting the implementation of plans and strategies to control NCDs risk factors.

Such areas as; feasible strategies to reduce use of sugar, salts, fats and alcohol; monitoring and promoting the quality of air and environment to prevent NCDs; monitor climatic changes and explore their correlation with NCDs; evidence-based policies and plans on, and restructuring of towns and cities to promote physical activity, and, integration of promotion measures in schools also worthy attention of scientists.



Other areas that should be taken into account; establishing the safety of alcoholic beverages, foods and other consumables implicated in NCDs; drives of availability and intake of micronutrients in Tanzania; Correlation of energy intake and its expenditure across the population strata and factors associated with positive energy balance. Increase in road safety measure to decrease the number of road traffic accidents which are a rising contributor to the burden of NCDs. The interaction between NCDs and IDs in Tanzania context also need to be investigated.



Enabling Environment

Background

Both nationally and globally, NCDs in recent decades have become the most threatening health conditions accounting significantly to disabilities, morbidity, mortality and huge socioeconomic impacts on individuals and countries. In realizing this, the NCDs related agenda have been incorporated into the national and international plans, policies and strategies.

The pace of investing on various NCDs related services and activities (research included) have varied greatly across countries, mainly influenced by their respective income levels and political commitment (WHO GCM/NCD Working Group, 2017; Ganju *et al.*, 2020). NCDs related services and activities are mainly coordinated by the ministry of health however, given the complexities of their risk factors (prevention), service financing, treatment and rehabilitation, a comprehensive framework that involves closely collaboration with different partners are needed. Such partners include politicians, policy makers, scientists, health care workers, implementing and development partners among others (Ganju *et al.*, 2020).

The framework is valuable in development, revision and enforcement of such polices, guidelines and regulations on; harmful products, diets, healthy lifestyle, financing and resource (human, organizational etc.,) mobilization strategies, treatment and referral and, research among many.

The WHO countries globally had set targets against which to track the progress of their corresponding commitment in improving NCDs services. Until 2019, three quarters of all countries, Tanzania included had central NCDs unit at the ministry however paucity of these had strong coordinating mechanisms in (WHO GCM/NCD Working Group, 2017; WHO Evaluation Office, 2020).

With regard to countries' commitment fulfilment progress indicators (COM) that includes policies on salt and fats, taxes on tobacco and alcohol, restrictions on advertising harmful products etc., there has been some improvements between 2015-2019 however, most



countries have not even partially attained these targets. Recent evidence has further showed that, even in those countries with such comprehensive regulations that are geared to restrict and control especially the harmful products, their execution has so far been disappointing owing to the different interests among the stakeholders involved and, the lack of strong dedicated central enforcing mechanisms (WHO GCM/NCD Working Group, 2017).

Most developing countries in particular are also still struggling to develop and implement national research policies, surveillance systems and other regulatory frameworks which are related to the prevention and control of NCDs. Furthermore, despite the exponential increase in the burden of NCDs and their related consequences, the NCDs related activities still receive the list share of funding as compared to communicable diseases. As of 2019 for instance, across 44 surveyed countries, spending on infectious diseases was approximately thrice that which is set for NCDs in the same countries with least spending observed in low-income countries mechanisms (WHO GCM/NCD Working Group, 2017).

Gaps

Tanzania like most countries have in place national strategy for NCDs and several efforts have been underway to increase awareness on NCDs and promote measures and efforts which are all geared towards addressing the growing burden of NCDs. Gaps however still exist in different areas such as; innovative and sustainable funding mechanisms; healthy, impactful, focused and sustainable multi-stakeholders' engagement approaches, relevance and suitability of the current policies, guidelines and strategies in addressing the risk factors and the growing burden of NCDs; the adequacy of the health systems response to the growing burden of NCDs, mobilization and equitable distribution of resources. The role and use of research overall is still underrated.

Research Areas

Research areas that may have to be examined in order to evaluate and hence, sustain or improve the existing environment for delivering services and conducting research on NCDs include analyzing the implementation of set global and national regulatory frameworks on NCDs; adequacies of policies and regulations in risk factors, resource mobilization and



financing mechanisms; adequacy and appropriateness of the existing resource allocation for NCDs.

Worthwhile considerations are also important on areas such as; cost-effective mechanisms to monitor and evaluate the implementation of NCDs policies, indicators and strategies; utility of mass media in risks communication, monitoring and evaluation of NCDs activities; integration of gender issues and equity in NCDs related policies and strategies; inter-and intra-sectoral policies and strategies for addressing NCDs risk factors and burden; reflection and utilization of research in policies and strategies that are related to NCDs.



Health System

Background

Health system research is an integral part of operational and implementation research on health which aims at improving the access to and delivery of healthcare services against various diseases and ill conditions. The system has six building blocks that operate like a pulley system, implying each block has a key role to play in making sure that the health system is responsive to the health needs of the population. They include human resources for health, service delivery, information/communication, medicines and technologies, financing, leadership and governance (World Health Organization (WHO), 2010).

Historically, infectious diseases like Malaria, Tuberculosis, HIV and bacterial infections have been the main preoccupation of health sector planning and implementation in Tanzania for many years (Ministry of Health and Social Welfare, 2008). Even recently, still, the greater burden of disease in the country could be attributed to communicable diseases. In that regard, resource allocation in the health sector is skewed towards infectious diseases. However, the dynamics of disease burden in the country are rapidly changing such that the notion communicable diseases are the major cause of morbidity and mortality in the country is no longer tenable. Currently, greater attention is needed as now we are faced with the double burden of communicable and non-communicable diseases.

The NCD challenge is overwhelming and concerning, when you consider poverty levels, resource constraints to the health sector, huge costs of managing malaria, HIV and AIDS, tuberculosis and reproductive health, effects of climate change, world food crises among others. Despite all those adverse factors, Tanzania is forced to address NCD needs before it is too late.

Any delays in the recognition and development of appropriate interventions for NCD is likely to undermine even the modest successes recorded in the control of communicable diseases. It is not a matter of either-or. It is necessary to have a balanced approach in planning and resource allocation for both communicable diseases and NCDs, and at the same time, explore



the feasibility of merging the IDs and NCDs programs for cost-effective and efficient utilization of the available resources.

In Tanzania, there is a rich experience of morbidity and mortality caused by cardiovascular diseases, cancer, diabetes, chronic respiratory disease, oral health, mental health and substance abuse, accidents and injuries. These groups of conditions constitute the more common NCDs. Of much concern are the patients who have a double burden of communicable and NCDs and the number keeps rising unless appropriate interventions are put in place.

In the current transition period whereby the burden of NCDs is growing at an alarming rate; the national health system needs to be strengthened to respond to this challenge (Mayige *et al.*, 2011). Thus, health system research focusing on NCDs will help to understand and improve on how the health sector and organize the delivery of the highly needed rehabilitative, preventive and treatment interventions in the middle of declining resources while health needs are on the increase (Mfinangai *et al.*, 2011).

The gaps and research questions related to health system research have been clustered according to the six-building blocks of the health system. In addition, the seventh cluster on the response on health emergencies concerning NCDs has also been included herein to interrogate gaps and questions which should be addressed to protect people who have different NCDs as follows;

Service delivery

Gaps

Areas that are yet to be addressed adequately in the delivery of services for NCDs and their related comorbidities in Tanzania include; lack of integrated service delivery model from community to tertiary level, weak referral system both forth and backwards, weak evaluation and monitoring of the quality of NCD services including the lack of indicators for monitoring the quality of NCD services at all levels, limited capacity and provision for palliative care on NCD patients and limited information on the magnitude of the contribution



of traditional and alternative medicine in the treatment and management of NCD, lack of timely and reliable data on the distribution of health facilities, and inadequate systems for Information, Education and Communication (IEC) and behavioural change communication on NCDs.

Priority Research Areas

Specific research areas include; evaluation of strategies to the strengthen the referral system bottom-up to improve service delivery and treatment outcomes, examining mechanisms to be put in place to improve the monitoring of the quality of NCDs services in the country, evaluation of capacity needs to enable effective delivery of palliative care on NCD patients at all levels of service delivery and exploring mechanisms to be put in place to enable identification and documentation of traditional and alternative medicine which have proven effective in the treatment and management of NCDs; integration of NCD services in the system of communicable diseases, generation of timely and reliable data on the distribution of health facilities and development of adequate and sustainable systems for IEC and behavioural change communication on NCDs.

Health Financing

Gaps

Areas that are yet to be addressed adequately in NCD care financing include; Inequity in accessing healthcare, limited financing of NCDs services for the poor, unequal benefit packages for healthcare services for NCDs notable example is Improved Community Health Fund (iCHF) vs National Health Insurance Fund (NHIF) and weak capacity at primary health care (PHC) to plan, prioritize and use Increase in road safety measure to decrease the number of road traffic accidents which are a rising contributor to the burden of NCDs. finances for NCDs.

Priority Research Areas

Specific research areas include; factors affecting access to healthcare at all levels of service delivery; equity issues affecting access to healthcare services for NCD patients; mechanisms



to improve the financing of healthcare services for the NCD patients particularly the poor; improving the benefits package to improve access to quality healthcare services among the NCD patients; capacity needs for PHC to be able to appropriately prioritize, plan and utilize finances allocated for NCDs healthcare services and scaling up of social health protection schemes to improve access and engagement in care for people with chronic conditions.

Human resources

Gaps

Areas that are yet to be addressed adequately in human resources for NCDs care delivery include; limited skills and knowledge to diagnose and treatment of NCD at the PHC, inadequate task shifting and sharing mechanism particularly at the PHC level and inadequate mechanism for monitoring accountability of human resources.

Priority Research Areas

Specific research areas include; adequacy of skills and knowledge of health care workers at PHC in the prevention, diagnosis and treatment of NCDs; mechanisms to be put in place to facilitate task shifting and sharing particularly at PHC; education sector reforms to facilitate the generation of quality and competent healthcare workers and adequate mechanisms for monitoring accountability of human resources. Attention should be given to establish the suitability of the current training curricula in medical/nursing schools in producing graduates with capacity to respond to NCDs related challenges. Also, establish optimum training required to be provided to students in medical/nursing schools and, to in-service trainees.

Technologies and Equipment

Gaps

Areas that are yet to be addressed adequately in technologies and equipment for NCD care delivery include; unreliable supply chain of commodities for NCDs at all levels, limited availability of cost-effective technologies to diagnose, treat and monitoring of NCDs at all



levels, lack of evidence-based selection and fair affordable management of technologies and equipment for sustainable use

Priority Research Areas

Specific research areas include; mechanisms to improve the supply chain of commodities for NCDs at all levels of healthcare service delivery, improving the availability of diagnostic technologies for NCD at all levels of healthcare service delivery and development of evidence-based selection and fair affordable management of technologies and equipment for sustainable use in NCD care.

Leadership and governance

Gaps

Areas that are yet to be addressed adequately in leadership and governance for NCD care delivery include; limited capacity of health facility committees, council health services Boards to plan and prioritize NCDs issues at their levels and lack of stewardship for NCD at all levels, lack of adequate strategies to translate NCDs research findings into policy and action, and lack of monitoring and evaluation of NCDs policies and programs for appropriate decision making, scale-up and sustainability.

Priority Research Areas

Specific research areas include; strengthening capacity needs to enable health facility committees, council health services boards to plan and prioritize NCD issues at their levels and strategies to be put in place to institute NCD stewardship at different levels of healthcare service delivery and decision making; strategies to be put in place to capture and absorb NCD research findings into policy and action, and development of monitoring and evaluation of NCDs policies and programs for appropriate decision making, scale-up and sustainability.

Information and communication

Gaps



Areas that are yet to be addressed adequately in information and communication for NCDs care delivery include; lack of integration of information system for NCDs and other diseases leading to information loss, inadequate use of routine NCD data for decision-making process at all levels, limited community access to information on NCD and their drivers, lack of registries for major NCDs diseases, lack of NCDs surveillance information systems, lack of interoperability and interconnectedness of existing health information systems, lack of well defined, comprehensive, functional, resilient, adaptable and scalable health information systems.

Priority Research Areas

Specific research areas include; mechanisms to integrate NCD information systems and other diseases to avoid information loss; development of platforms to facilitate the routine use of NCDs data for decision-making process at all levels; effective strategies to increase community access to information on NCDs and their drivers; development of registries and strong electronic medical records for major NCDs; development of NCD surveillance information systems; creation of interoperability and interconnectedness of existing health information systems and development of well defined, comprehensive, function, resilient, adaptable and scalable health information systems.

Response to Health Emergencies on NCDs

Gaps

Areas that are yet to be addressed adequately in response to health emergencies about NCDs care delivery include; lack of mapping of high accident spot areas and weak mechanism to monitor such areas, lack of preparedness and poor response to health emergencies which have impacts on NCDs service delivery, and lack of coping mechanisms to protect NCDs patients from the negative impact of health emergencies e.g., COVID-19. The lack of intelligent systems and predictive models that can provide alerts of possible health emergencies that can impact NCDs care delivery are also other sets of identified gaps.



Priority Research Areas

Specific research areas include; mapping of high accident spot areas and mechanisms to be put in place to monitor such areas; strategies for preparedness, the appropriate and timely response to health emergencies that have an impact on NCDs service delivery and development of coping mechanisms to protect NCDs patients from the negative impacts of health emergencies such as COVID-19, and development of intelligent systems and predictive models that provide alerts of possible health emergencies that can impact NCD care delivery.



Innovation and Implementation Research for Non-Communicable Diseases (NCDs)

Background

To date, the healthcare industry has produced a proliferation of innovations in terms of technologies used, both machines, equipment and digital tools, novel medicines and vaccines as well as novel processes. These technologies aim at enhancing life expectancy, quality of life, diagnostic and treatment options, as well as the efficiency and cost-effective healthcare delivery system. Various innovations are addressing NCDs that can be accessed and assessed for feasibility and finally adapted for use in Tanzania.

There are well known, non-invasive diagnostic procedures such as that measuring blood glucose and blood pressure. There are innovative procedures for centralized monitoring of health indices from remote settings. Similarly, there are rehabilitative innovative gadgets to monitor the mobility of patients recovering from a stroke. Feasibility studies where needed should be undertaken to facilitate adaptation if any to ease uptake of all innovations identified. There are people working on traditional NCDs therapeutics but there has not been any efforts to develop these into verified products with approved safety, efficacy and quality.

On the other side, a major challenge in the prevention and control of NCDs in Tanzania like other parts of the world has been that despite a wide range of global, regional and national plans, initiatives, policies and interventions, the impact on health outcomes still needs to be increased significantly. There is still a very notable 'evidence-into-implementation (or action)' gap in the country. This translation gap – between research evidence and practise – is now very well recognized in many health fields including NCDs prevention and control.

Reducing the gap between evidence from NCDs research and actual practice in prevention, control and treatment is associated with reductions in morbidity and mortality and reduced healthcare costs. Special attention is needed on barriers to the translation of research and



on how to develop evidence-informed implementation to improve patient outcomes. Evidence is now also needed on effective implementation of primary prevention of NCDs in different contexts through policies and intersectoral health promotion. Implementation research should be embedded in all stages involving the selection, adaptation and evaluation of policies or interventions for the prevention and control of NCDs

Gaps

Areas that are yet to be addressed adequately in innovation and implementation research for NCDs include; financial constraints that limit access, lack of alternative innovative payment mechanisms (payment in kind) to improve treatment affordability, lack of a mechanism in place to improve adherence to medication and treatment regime using patient support system (DOTS), this has worked well in infectious diseases such as management of TB patients.

Further gaps identified include; information on the availability low cost, indigenous, point-of-care tools, availability and reliability of data on affordability and effectiveness of the current options for NCD screening and treatment in healthcare facilities, feasibility of adding NCD related vaccinations such as human papilloma virus (HPV) and Hepatitis B to the National Immunization Programme.

There is still lack of data on the impact of environmental improvements to promote healthy lifestyles on the prevention and control of NCDs and, data on the working tools that effectively monitor population trends for risk factors and for NCD morbidity and mortality in Tanzania.

Priority Research Areas

Specific research areas include; Setting up zonal NCDs surveillance and monitoring networks (nested case-control/cohort studies) for early diagnosis, monitoring of treatment and updates on the burden on NCDs; promoting healthier lifestyles and rewarding best performances, development and implementation of standardized national guidelines for NCD research, affordability and effectiveness of the current options for NCD screening and



treatment in healthcare facilities, the feasibility of adding NCD related vaccinations such as HPV and Hepatitis B to the National Immunization Programme, the impact of environmental improvements to promote healthy lifestyles on the prevention and control of NCDs, working innovative tools that effectively monitor population trends for risk factors and NCD morbidity and mortality in Tanzania.



Multisectoral Approach in Addressing NCDs and their associated Comorbidities

The convergence of NCDs and Infectious Diseases (ID) in LMIC present new challenges and opportunity to develop responsive strategies to address this dual burden of diseases. Research has shown increased susceptibility to IDs such as HIV, TB and parasitic infections among patients with NCDs and vice versa (Remais *et al.*, 2013; Coates *et al.*, 2020).

Multi-sectoral approaches refer to the collaboration between organisations in different areas of policy (e.g., health, social, environment) and different sectors (e.g., public, private, third), as well as communities and people, working together to achieve policy outcomes. Given the magnitude of the burden, no one sector alone can prevent and manage NCDs diseases and their associated comorbidities effectively. Collaboration between governments, non-governmental organizations, industries, WHO and other partners is essential and very much needed. This approach ensures that resources are used efficiently and efforts are not duplicated. Thus, efforts would complement each other rather than conflict or compete.

Tanzania appreciates the role of the multisectoral approach in addressing NCDs and thus in the strategic and action plan for the prevention and control of NCDs in Tanzania 2016 – 2020, the second objective targets to strengthen leadership, governance, multi-sectoral collaboration for prevention and control of NCDs by 2020.

In multisectoral collaboration, it aimed to establish/strengthen multisectoral coordinating committee at all levels and to support multisectoral coordination committee meetings at national, regional and district levels. Research is needed to evaluate how far this plan has been successful and what needs to be done to make multisectoral collaboration more impactful in combating NCDs. Further evaluation is also needed to explore how well the collaboration between the stakeholders for IDs and NCDs programs can be enhanced.

Gaps

There are number of gaps existing in existing approaches that are focused in enhancing multisectoral collaboration in addressing NCDs. These include; the strengths of different



sectors have not been harnessed extensively while addressing the contemporary NCDs challenges and, the engagement of non-health sectors despite their contribution to risk factors, is still low. Furthermore, the political will and governance structure to promote and sustain multisectoral collaborations are inefficient and ineffective. More emphasis and commitment are still needed in enhancing assessment and control measures of the quality of locally manufactured and imported human consumable including foods and beverages. As compared to IDs programs, NCDs programs are still poorly funded and coordinated, and these two still work in isolation despite the established evidence of close interaction between IDs and NCDs.

Priority Research Areas

Specific research areas include; integrating specific health interventions using multisectoral (sectors, program, policies, and activities); advocacy/interventions to be implemented to promote multisectoral partnership and strengthening capacity to accelerate and scale up the national response to NCDs epidemic and their associated comorbidities; interventions that can facilitate securing all high government levels commitment in responding to NCDs and their comorbidities; health promotion and risk reduction interventions/strategies that can promote the development of population-wide solutions to reduce exposure to key risk factors; legislature interventions by TFNC, TBS, DCEA and TMDA focusing on food, drug and substance-related risk factors; interventions to be put in place to establish sustainable and predictable financing mechanisms from different non-health actors and interventions that will build capacity for cross-cutting issues within the multisectoral framework for the prevention of NCDs and their associated comorbidities.



National NCDs Research Agenda Information

Status of Research Agenda

This is the first national NCDs research agenda.

Key Stakeholders

- i. Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC)
- ii. President's Office, Regional Administration and Local Government (PORALG).
- iii. Prime Minister's Office, Sectoral Coordination Unit and other ministries
- iv. Policy makers
- v. Research and academic institutions.
- vi. Funding organizations.
- vii. Health facilities

Approval Details

The ----- shall approve the National NCDs Research Agenda.

Endorsement Details

The approved the National NCDs Research Agenda on.....

Related Legislation

RELATED DOCUMENTS

- i. National Strategy for Prevention and Control of NCDs (2018)

Effective Date for the Research Agenda



Unless otherwise determined by the approving body, the National NCDs Research Agenda shall become effective from the date it is approved by

Next Review Date

Three years after approval and when deemed necessary.

Research Agenda Document Owner

Research Agenda Author

.....

Contact Person



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