

**ADVANCING NON-COMMUNICABLE DISEASE CARE IN TANZANIA: A
REVIEW ON COMMUNITY AND PRIMARY HEALTH CARE-BASED
APPROACHES AND LESSONS LEARNED:**

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ADVANCING NON-COMMUNICABLE DISEASE CARE IN TANZANIA: A REVIEW ON COMMUNITY AND PRIMARY HEALTH CARE-BASED APPROACHES AND LESSONS LEARNED:

A thesis submitted in partial fulfilment of the requirement for the degree of Master of Science in International Health.

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Declaration:

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Signature

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LIST OF ABBREVIATIONS AND ACRONYMS

Ads	Advertisements
CCM	Chronic Care Model
CDC	Centre for Disease Control
CDoH	Commercial Determinants of Health
CHE	Current Health Expenditure
CHMT	Council Health Management Team
CHWs	Community Health Workers
CTC	Close-To Community
DHFF	Direct Health Facility Financing
DM	Diabetes Mellitus
EAC	East Africa Community
GDP	Gross Domestic Product
GoT	Government of Tanzania
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
HMIS	Health Management Information System
HRH	Human Resources for Health
HSSP V	Health Sector Strategic Plan V (2021-2026)
iCHF	improved Community Health Fund
ICCCF	Innovative Care for Chronic Conditions Framework
LGAs	Local Government Authorities
LMICs	Low-Middle-Income Countries
mHealth	Mobile Health
MoH	Ministry of Health
MUHAS	Muhimbili University for Health and Allied Sciences
NCDs	Non-Communicable Diseases
NGO	Non-Government Organization
NHIF	National Health Insurance Fund
NIMR	National Institute of Medical Research
PHC	Primary Health Care
PORALG	The President's Office-Regional Administration and Local Government
SSA	Sub-Saharan Africa
STG/NEML	Standard Treatment Guideline/National Essential Medicine List
TANCDA	Tanzania Non-Communicable Disease Alliance
TBS	Tanzania Bureau of Standards
TDA	Tanzania Diabetes Association
TFDA	Tanzania Food and Drug Authority
TZS	Tanzanian Shillings
UHC	Universal Health Coverage
URT	United Republic of Tanzania
USAID	United States Agency for International Development
WHO	World Health Organization

Glossary

Community-Based Approach- Is a non-clinical approach that mobilises assets within communities by deploying strategies that aim to prevent diseases and reduce health disparities (1).

Comprehensive evidence-based care- It involves the use of best available evidence to inform decision making and practices about health systems and communities in the domain of health protection, disease prevention and health promotion (2).

Continuity and Coordination of Care- These are two concepts that relate to how health care is provided over time and across different levels of health system. Continuity of care means that care is linked and coherent overtime and consistent with the patients' needs. Coordination of care means that healthcare professionals work together in a proactive manner to deliver the right care at the right time (3).

Digital Health Interventions- This is the use of information and communication technologies in support of health and health related fields such as Mobile health (mHealth), telemedicine or Electronic Medical Records (4).

Patient access to care- It refers to the ability of individuals to obtain and use healthcare services, information, and resources timely. It is influenced by factors such as availability, acceptability, affordability, and quality of care (5).

Primary Health Care (PHC)- Is a whole-of-society approach to health with the aim to ensure highest possible level of health and well-being and equitable distribution. PHC focuses on people's needs and ensures early continuum of care that is close to people's environment, from health promotion, disease prevention to treatment, rehabilitation, and palliative care (6).

Non-Communicable Diseases (NCDs)- These are known as chronic diseases, that are not passed down from one person to another and tend to have a long duration and generally slow progression. They are a result of a combination of genetic, physiological, environmental, and behavioural factors (5).

ABSTRACT

Background:

Non-Communicable Diseases are chronic health conditions that tend to have a long duration and impact a person's quality of life such as disabilities, chronic pain, and premature deaths. In Tanzania, the four major NCDs are in the top ten leading causes of death, namely cardiovascular diseases, cancer, diabetes, and chronic respiratory diseases.

Objective:

The study aims to develop a comprehensive understanding of the reasons behind the preference of regional or tertiary hospitals over primary health facilities among individuals with NCDs. Also, it intends to provide recommendations to improve NCD policy and implementation to the Ministry of Health (MOH) and to the Tanzania Non-Communicable Disease Alliance (TANCDAA) to improve health outcomes and reduce the burden of NCDs through primary healthcare and community-based approaches in Tanzania.

Method:

A literature review was done, and the analysis was guided by the conceptual model for delivering integrated primary care for chronic diseases by Harrison SR and Jordan AM. This conceptual model was adapted for the Sub-Saharan Africa context.

Results:

Findings reveal that there is a critical shortage of human resources for health, poor patient access to care, quality of care, coordination and continuum of care, low level of evidence-based practices, low level of community awareness and partnerships, as well as lacking social accountability and distrust towards health providers and the PHC facilities.

Conclusion and recommendations:

The MoH should ensure the implementation of integrating NCD care at the Primary Health Care (PHC), and TANCDAA should advocate for community partnerships, social engagement by PHC facilities.

Keywords: Non-Communicable Diseases, primary health care, community-based care, Tanzania

Word count: 12,212 words.

INTRODUCTION

As a general practitioner, I worked at the Department of Internal Medicine and Dialysis unit at Iringa Regional Referral Hospital. While at work, I observed an increase in admissions due to complications related to the four major NCDs, particularly (cardiovascular diseases, diabetes, cancer, and chronic respiratory diseases). I witnessed a lot of complications such as stroke, kidney failure, diabetic foot ulcers, amputees due to uncontrollable glycaemic levels, neoplasms, and premature deaths caused by NCDs. Taking History of Presenting Illness (HPI) reports revealed that many of these late hospital visits or admissions were due to a lack of knowledge on these diseases, late diagnosis, different health-seeking behaviours, incapacity to afford and lack of adherence to medications.

At the regional referral hospital, we were also involved in community screening and outreach programs for NCDs which were held once in different communities. These outreach programs included health providers from the referral and district hospital but none from the dispensaries, health centres or community health care at the primary health level. I believe these occasional community outreach programs did not make a notable change in the behavioural lifestyle of people. I thought there must be a different way to approach the people in communities about NCDs prevention, management, and complications at large.

Therefore, the focus of my thesis is to assess the primary health care and community-based approaches to non-communicable disease care in Tanzania: with a focus to understand the reasons behind the preference of regional or tertiary hospitals over primary health facilities among individuals with NCDs and providing recommendations for improving health outcomes and reducing the burden of NCDs in Tanzania.

CHAPTER 1: BACKGROUND

Globally there has been an evident increase in the burden of non-communicable diseases since the second half of the 20th century. Approximately 41 million people die each year due to complications of NCDs; which is equivalent to 74% of all deaths. Of all these NCDs deaths globally, 77% are from low and-middle income countries (LMIC) and 17.9 million are due to cardiovascular diseases, 9.3 million from cancers, 4.1 million from chronic respiratory diseases and 2.0 million from diabetes each year (7). Non-communicable diseases are chronic health conditions that tend to have a long duration. These diseases are often due to a combination of genetic, physiological, environmental and lifestyle factors which develop gradually over time. The most common NCDs are cardiovascular diseases (e.g., heart diseases, stroke), cancers, chronic respiratory diseases (e.g., asthma, chronic obstructive pulmonary disease), diabetes, mental disorders, and injuries (8). The risk factors of NCDs can be categorized as modifiable behavioural risk factors such as tobacco use, physical inactivity, unhealthy diets, and harmful use of alcohol and non-modifiable risk factors such as genetics and the aging of the population. Metabolic risk factors also contribute to the onset of NCDs, risk factors like; raised blood pressure, overweight/obesity, high blood glucose (hyperglycaemia) and elevated levels of fat in the blood (hyperlipidaemia). The primordial and primary prevention of NCDs aims to reduce the exposure of risk factors (tobacco use, harmful use of alcohol, unhealthy diet, physical inactivity) whereas secondary prevention concerns the detection and treatment at an early stage before it causes complications or disabilities as illustrated in (figure 1) (9,10).

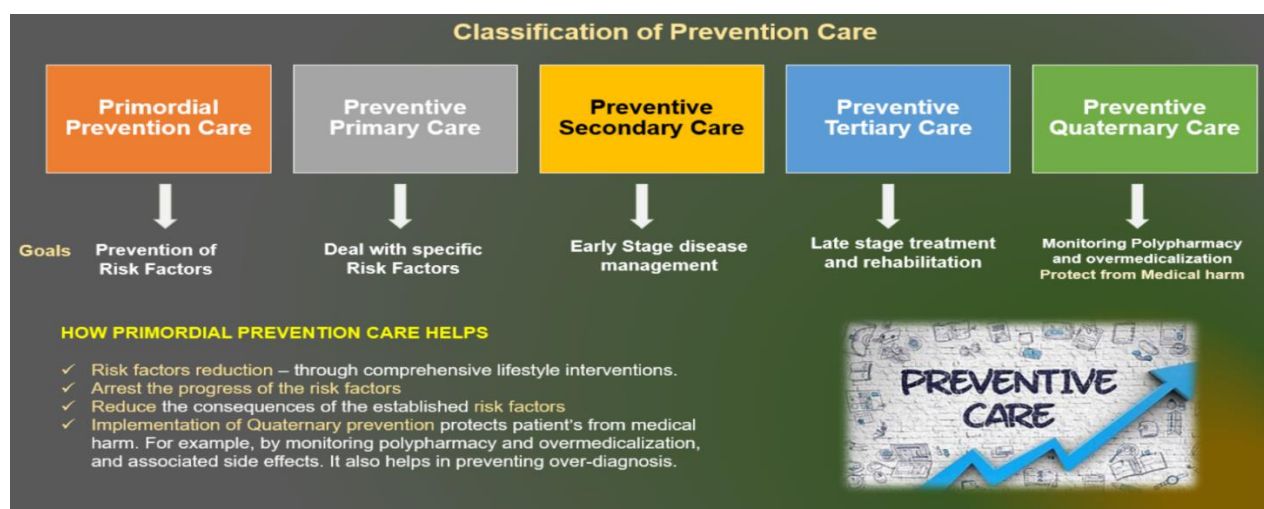


Figure 1. Prevention levels (9)

While there are many levels to intervene in halting the incidence of NCDs, this thesis will focus on primary health care and community health approaches. The focus on community level will be on the preventive measures of NCDs in the Tanzania communities: the reason being most Tanzanians especially in semi-urban or rural areas are unaware of what NCDs are and some are living with NCDs without their knowledge. This leads to a lot of people seeking health care at the late stage of the disease, hence increase in premature deaths. However, to make an analysis of the primary health care and community-based approaches, it is important to understand the four major risk factors of NCDs, commercial determinants of NCDs and the implementation of policies on alcohol, tobacco, unhealthy foods, and physical inactivity in Tanzania as WHO and its member state suggest. Therefore, this section first provides an overview of Tanzania, its health situation and policies and then addresses the factors contributing to NCD incidence in Tanzania.

1.1. NON-COMMUNICABLE DISEASES (NCDs) SITUATION IN TANZANIA

According to the World Bank collection of development indicators, deaths due to NCDs in Tanzania increased from 26% in 2010 to 34% in 2019 (11). In all cases, the probability percent of dying prematurely (between 30-70 years of age) from NCDs for both sexes are 17.9%. Males account for 18.5% whereas females account for 17.4%. While there seem to be many factors at play in the increase of NCDs across the population in Tanzania it is noted that; limited access to healthcare services for prevention and management of NCDs, especially in the rural areas can contribute to the high burden of NCDs in the country (12). The consequences of NCDs such as disability, chronic pain, and premature death can be severe and impact a person's quality of life. The demographic and epidemiological transition seen in the past few decades in Tanzania and SSA clearly shows the great shift and rise of NCDs. As of 2019, all the four major NCDs are in the top ten leading causes of death in Tanzania with cardiovascular diseases being number one as seen in (figure 2). In this thesis I will focus on these four NCDs in Tanzania: cardiovascular disease, cancer, diabetes and chronic respiratory diseases and review how the primary health care and community health provide NCD health and prevention services, especially in semi-urban and rural areas.

Main causes of deaths in Tanzania as of 2019

(in deaths per 100,000)

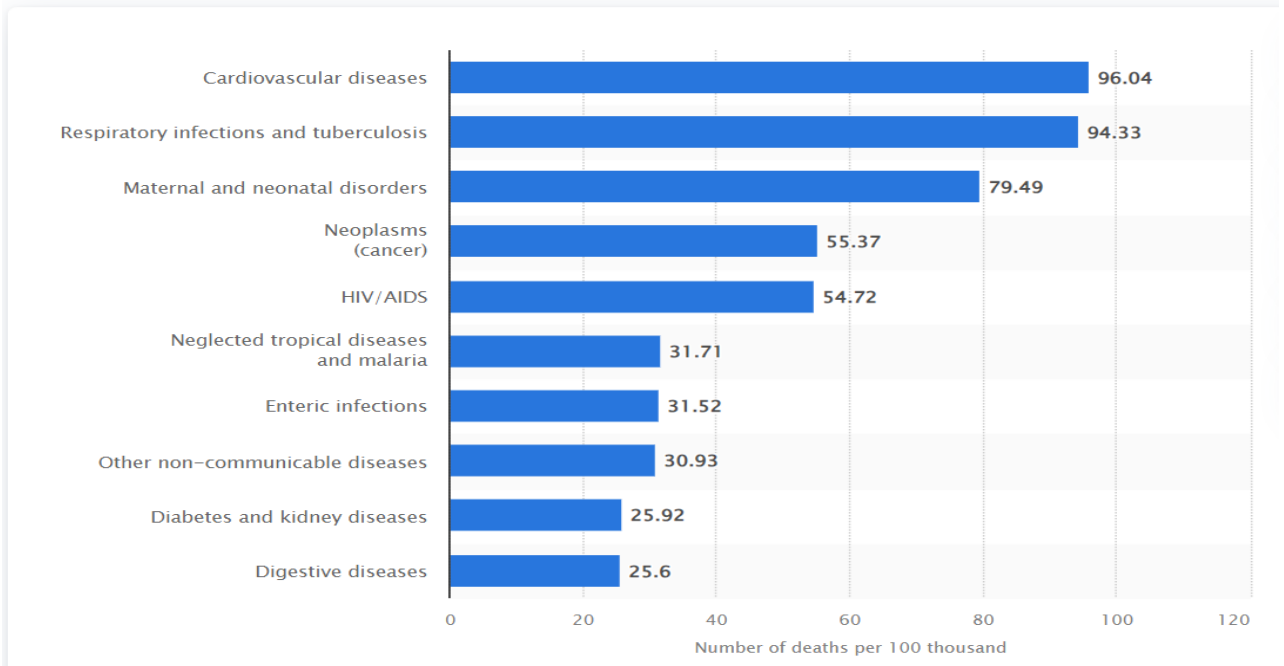


Fig. 2 Top 10 leading cause of death in Tanzania 2019 (13) . source; Statista.

1.2. GEOGRAPHY

The United Republic of Tanzania (URT) is an East African country bordered by eight countries: Kenya and Uganda to the North, Burundi, Rwanda, and the Democratic Republic of the Congo to the west, Malawi, Mozambique, and Zambia to the South, with the Indian Ocean to the east. The United Republic of Tanzania is a union between Tanganyika (Tanzania mainland) and Zanzibar (Tanzania Island). Her capital city is Dodoma located at the centre of the country. As the 31st largest country in the world and 13th in Africa, URT is approximated to be 947,303 square kilometres with the total population is 61 million people, 51% of the population are women and 49% are men according to the 2022 census results (14).

1.3. SOCIO-CULTURAL AND ECONOMIC SITUATION

Tanzania has 31 regions and 126 tribes each with its own diverse culture and indigenous language, the national language is Swahili. Tanzania remains a low-middle-income country. One-third the population is found in the urban areas and two-thirds in rural areas with 49% of her people living in poverty (15). Tanzania's Gross Domestic Product (GDP) has steadily grown with economic growth rates of 2% in 2020, 4.3% in 2021 and 4.5% by July 2022 (16).

1.4. TRENDS IN HEALTH

Tanzania, like many other countries has, undergone a significant epidemiological and demographic transition in recent decades. Tanzania has made substantial progress in reducing the burden of infectious diseases such as malaria, tuberculosis, and HIV/AIDS (13). This was done through effective control programs and improved healthcare access. However, the country now faces a growing burden of NCDs including cardiovascular diseases, diabetes, cancer, and chronic respiratory diseases as (figure 3) illustrates the leading cause of burden of disease between 1990 and 2017 in Tanzania (17). Several factors contribute to the rising prevalence of NCDs in Tanzania (18). These include urbanization, adoption of westernized lifestyle, (such as sedentary behaviour, unhealthy diets, and tobacco use), and limited access to preventive healthcare services, limited healthcare infrastructure, and barriers to accessing care in rural areas (19). The major four NCDs listed above can be avoided by a set of actions control on the cause and risk factors, including health promotive activities that focus on behaviour change and primary prevention services. Both promotive activities and primary prevention and/or secondary prevention have shown to be effective measures in addressing NCDs especially in resource constraint areas.

Leading causes of burden of disease in Tanzania between 1990 and 2017

Both sexes, All ages, DALYs per 100,000

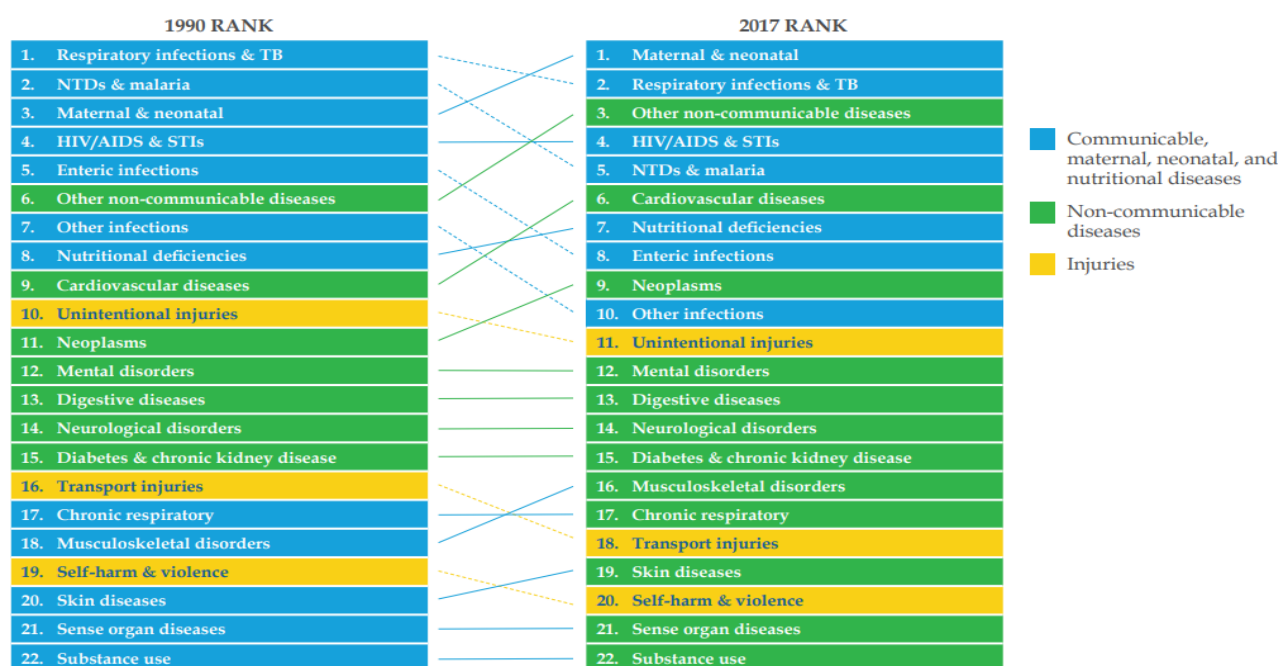


Figure 3: leading cause of burden of disease in Tanzania between 1990 and 2017, GBD study (17).

1.5. COMMERCIAL DETERMINANTS OF HEALTH

Commercial determinants of health (CDoH), in this case commercial determinants of NCDs, are factors that influence health which stem from a profit motive (20). The World Health Organization (WHO) defines CDoH as the conditions, actions, and omissions by cooperate actors that affect health positively or negatively (21). The private sector uses CDoH as strategies and approaches to promote products that are detrimental to health, in return the population is at risk from consumption of, or exposure to commercial products such as unhealthy foods and beverages, tobacco and alcohol (22). The Tanzania Food, Drugs and Cosmetics (Control of Food Promotions) Regulations 2010 has failed to provide strict regulations on misleading advertisement in relation to all food consumable by infants and young adults (23). There are aggressive advertisements on alcoholic beverages and unhealthy foods on radios and television during program sessions for children. This has led young people opting for unhealthy foods and drinks compared to healthy ones (23). These commodities such as soft drinks and processed foods that are high in salt and sugar, as well as tobacco and alcohol are affordable and readily available even in rural areas of Tanzania (22,24). In addition, these sugar sweetened beverages like sodas mostly sponsor the youth sport tournaments in Tanzania. Tobacco or brewery companies use lobbying to prevent the introduction or stringent alcohol or tobacco control measures in Tanzania with economic arguments such as provision of employment to the youth and an increased tax revenue (23).

1.5.1. TOBACCO LAW

In 2003 the government of Tanzania enacted the Tobacco products (Regulation) Act 2003 which; prohibited smoking in public places and regulates the manufacturing, labelling, distribution, sale, and promotion of tobacco products (25). However, smoking in public areas has persisted despite the existence of the Act 2003. Until 2015 there were no accompanying regulations to guide its implementation. Aso, conflicting messages from Ministry of Agriculture and Finance as tobacco cultivation is one of strategic economic plan for it is known to employ significant numbers of rural Tanzanians who are among the largest taxpayers. All these hinder the effective implementation of tobacco control measures (26). The prevalence of smoking both sexes aged 15 years and above in Tanzania has declined from 11.60% in 2015 to 8.70% in 2020 (27).

1.5.2. ALCOHOL CONTROL POLICY

The East African Community (EAC), comprising of: The Republic of Burundi, Kenya, Rwanda, South Sudan, Uganda, and the United Republic of Tanzania, has developed a comprehensive policy to cover prevention, control and management of alcohol and drug use and include strategies for rehabilitation of drug users during their 16th ordinary meeting in 2019 (28). These policies were: To prevent and reduce the uptake of alcohol, drugs and other substances among young people and other vulnerable populations including women and children to allow them to realize their full potential (29), to regulate the distribution of alcohol products including drinking hours and age limit in the region, and to establish educational programs to improve access to knowledge about alcohol and drug use and related dangers to influence adoption of positive behaviour among target audiences (28).

The rate of heavy episodic drinking in Tanzania is 7.7% among women and 33.4% among men of 15 years and above according to the global status report on alcohol and health in 2018 (30). The World Bank estimates an average of 10.4 litres in 2019 from 11.6 litres in 2015 of pure alcohol are consumed by Tanzanians aged 15 years and above annually. The total alcohol consumption per capita by male and female in comparison from 2015 to 2019 has reduced; from 19.8 litres to 17.6 litres and from 4 litres to 3.6 litres respectively (30,31). The main reasons for excessive alcohol consumption are loneliness, depression, family breakdown, unemployment, and peer pressure such as academic or socioeconomic pressure (32).

1.5.3. FOOD AND FOOD SECURITY

The Tanzania constitution states the right to safe food for all its citizen. However, Tanzania has not created a specific national food safety policy despite food safety being a driver for formulation of several national policies national Agriculture policy of 2013, and the National Health policy of 2017 as well as the national food and nutrition policy (33). The implementation of all these policies is done in a series of programs, initiatives, plans and projects (33). Unfortunately, the policy on food and nutrition does not address the issue of food and nutrition with the view of curbing NCDs, but rather malnutrition (23). Formerly, the regulation of food was under Tanzania Foods and Drugs Authority (TFDA), but this role was given to Tanzania Bureau of Standards (TBS). The key role of TBS is to set standards for key aspects of food products, including ingredients and constituents, packaging, labelling, and marketing. TBS falls short in enforcing these regulations as seen on

commercially produced foods which are not optimal and often do not follow legislative requirement or practice: for example, foods like pizza, fries or burgers sold in from western franchise fast foods contain imported ingredients which are frozen with consequent deterioration of their quality. In addition, through their aggressive marketing on televisions and radios these foods are liked more by children aged 5-17 years of age (23).

Furthermore, food products processed in formal industrial settings are more likely to receive inspection and monitoring than those in informal settings. Likewise, pre-packaged products are more likely to receive inspection than unpackaged products, including locally produced fresh fruits and vegetables (33,34). Rural area markets and food retailers may receive less inspection and monitoring than their counterparts in urban areas (35).

1.5.4. POLICY ON PHYSICAL INACTIVITY

There is a high prevalence of physical inactivity among adolescents in Tanzania, as high as 82% both sexes, male account for 78.2% while female accounts for 86% (23). The global nutrition report shows 15.2% of adult (aged 18 years and over) women and 5% men are living with obesity in Tanzania. Tanzania's obesity prevalence is lower compared to the SSA regional average of 20.8% for women and 9.2% men (36,37). Urban residence, higher education and being employed were all associated with increased risk of overweight and obesity. Also, bizarre as it sounds, in the Tanzanian culture as it is the case in most of developing and least developed countries, obesity is often confused with wealth and prosperity as many exercises less, use vehicles to work and most of the time the job does not require any physical activity (23,38).

Physical activities have not been given so much attention in Tanzania except for sport courses in primary, secondary and college curricula (39). There is poor infrastructure design especially roads such as absence of walkways for pedestrians or lanes for cyclists. There is lack of open spaces particularly in urban areas where children and adults can practice physical activities (23,40). Furthermore, many Tanzanians cannot afford the available fitness centres. Also, few public education and awareness campaigns and programs on physical activities are present in the country (23,39,40).

1.6. THE TANZANIA HEALTH SECTOR STRATEGY PLAN V 2021-2026

One of the aims of the Health Sector Strategy Plan V 2021-2026 (HSSP V) is to decrease morbidity and mortality due to NCDs; the health sector will implement strategic efforts to address the increased emerging trends of overweight and obesity among all age groups (41). In this plan, the health sector will engage communities and promote the participation in NCD prevention and control. An important strategy is to foster intersectoral collaboration in prevention and control of NCDs through interventions outside the health sector, e.g., ban on smoking, food processing, road infrastructure conducive to cycling and walking. Moreover, the health sector will continue to strengthen research into prevention and control of NCDs. The research findings will be used to develop appropriate strategies and interventions to prevent and control NCDs (41).

1.7. HEALTH SYSTEMS

The Tanzania health system is decentralized, framed by the country's national health policy. A cornerstone of Tanzania's health system is to deliver accessible quality primary health care to all citizens. The health system is well organized in a pyramidal structure from the community to the national level as illustrated in (figure 4) (42). The foundation of this pyramidal structure are primary healthcare services comprising of community-based health services, dispensaries, health centres and district hospitals. The GoT has 1 national Hospital, 6 national super specialized hospital, 11 hospitals at zonal level, 5 zonal referral hospitals, 28 regional referral hospitals, 31 hospitals at regional level, 180 hospitals at district level, 169 district hospitals, 1,083 health centres and 7,610 dispensaries owned by either the government or private sector.

The community-based health services are focused on health promotion and prevention, the dispensaries provide basic preventive services (immunizations or screening such as measuring of blood pressure or blood glucose), curative outpatient services and delivery services (antenatal and postnatal services). The health centres provide outpatient and inpatient services. At the district level, hospitals provide medical and surgical services and receive referred patients from the health centres. Advanced healthcare services are provided at the zonal or national hospitals (43). These are provided by both private and public health sectors: 60.7% of the health facilities are privately owned and 39.3% are public/government owned as shown in (figure 5). As of July 2023, a total of 11,448 operating health facilities are present according to the Health Facility Registry (HFR) data base; 284 NCD clinics in the public sector are for

prevention and control of NCDs across the country (44). These clinics were established by the TANCDA and Tanzania Diabetes Association (TDA) in collaboration with the MoH.

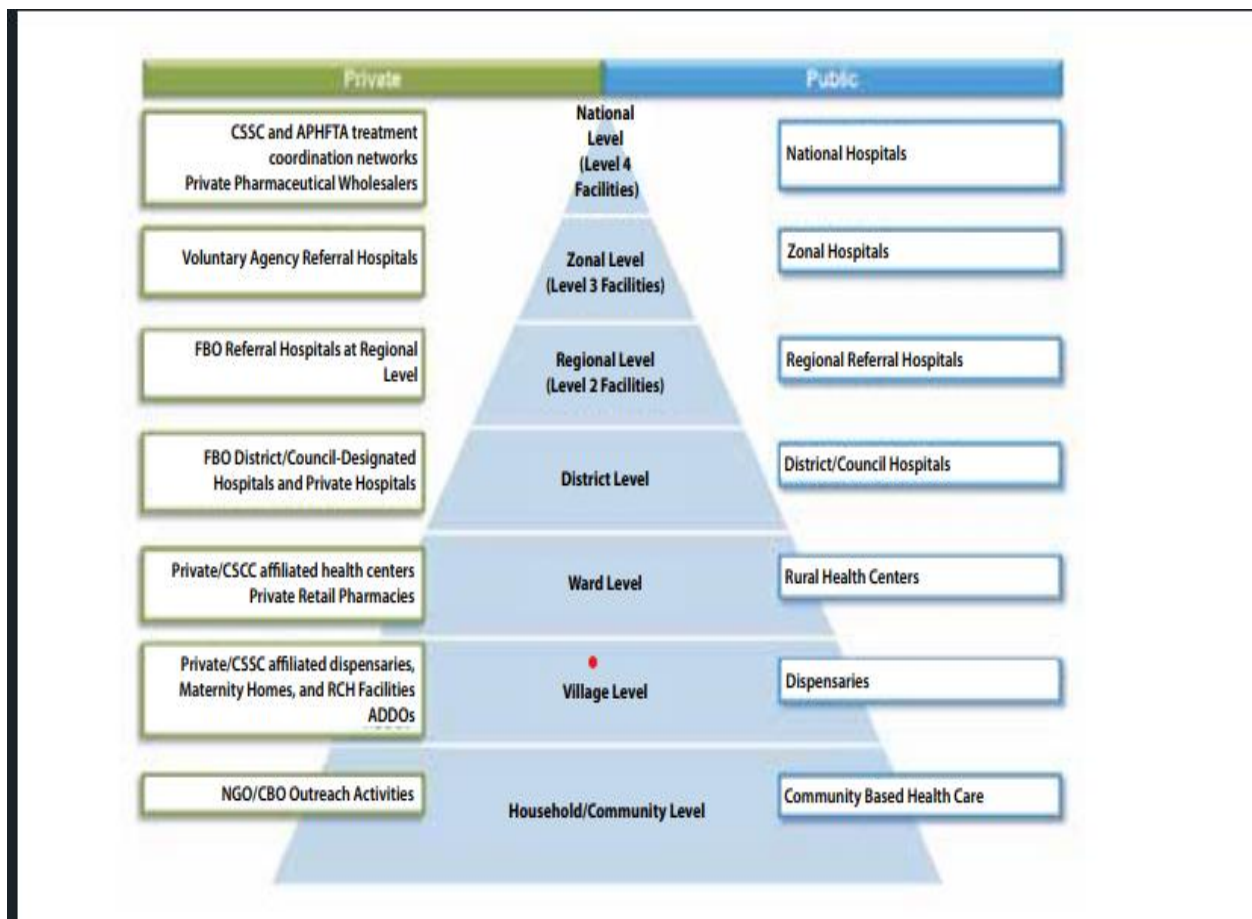


Fig 4. The healthcare pyramid in Tanzania (public and private equivalent) (42).

[Abbreviations: ADDO, Accredited Drug Dispensing Outlet; APHFTA, Association of Private Health Facilities in Tanzania; CBO, community-based organisation; CSSC, Christian Social Services Commission; FBO, faith-based organisation; NGO, nongovernmental organisation].

The Ministry of Health has the overall responsibility for provision of health and social welfare services. It regulates and coordinates the establishment of health institutions and the provision of health care services by the private sector. In addition, it sets the policy and guidelines; provides technical guidance to organisations involved in service delivery, defines priorities, mobilises resources and promotes standards for health and social welfare services (45). An example of public-private partnerships on NCDs, is the Tanzania Non-Communicable Disease Alliance (TANCDA). TANCDA is a non-governmental organization (NGO) that works with the government and other

local and international organizations and focuses on addressing the burden of NCDs in Tanzania (46). TANCDA was founded in 2012 with the aim to raise awareness on NCDs, promote prevention measures, and advocate for policies in supporting effective management and control of NCDs. They organise outreaches/ screening programs on NCDs, promotion through health education in schools or through educational leaflets. Also, health talks on tobacco use, alcohol reduction or physical activity through marathon programs as part of their mandate (47).

At the district level the Local Government Authorities (LGAs) are responsible for planning, delivering, and supervising services through the Council Health Management Teams (CHMT) in each district. The (CHMT) provides supportive supervision and capacity building for delivering preventive, rehabilitative, and curative services. In rural areas where over two-thirds of Tanzanians reside, people rely on public local health facilities which are at the primary healthcare level: district hospitals, dispensaries, health centres and community health services. These are run by the LGAs and provide people with basic health services (45) (48).

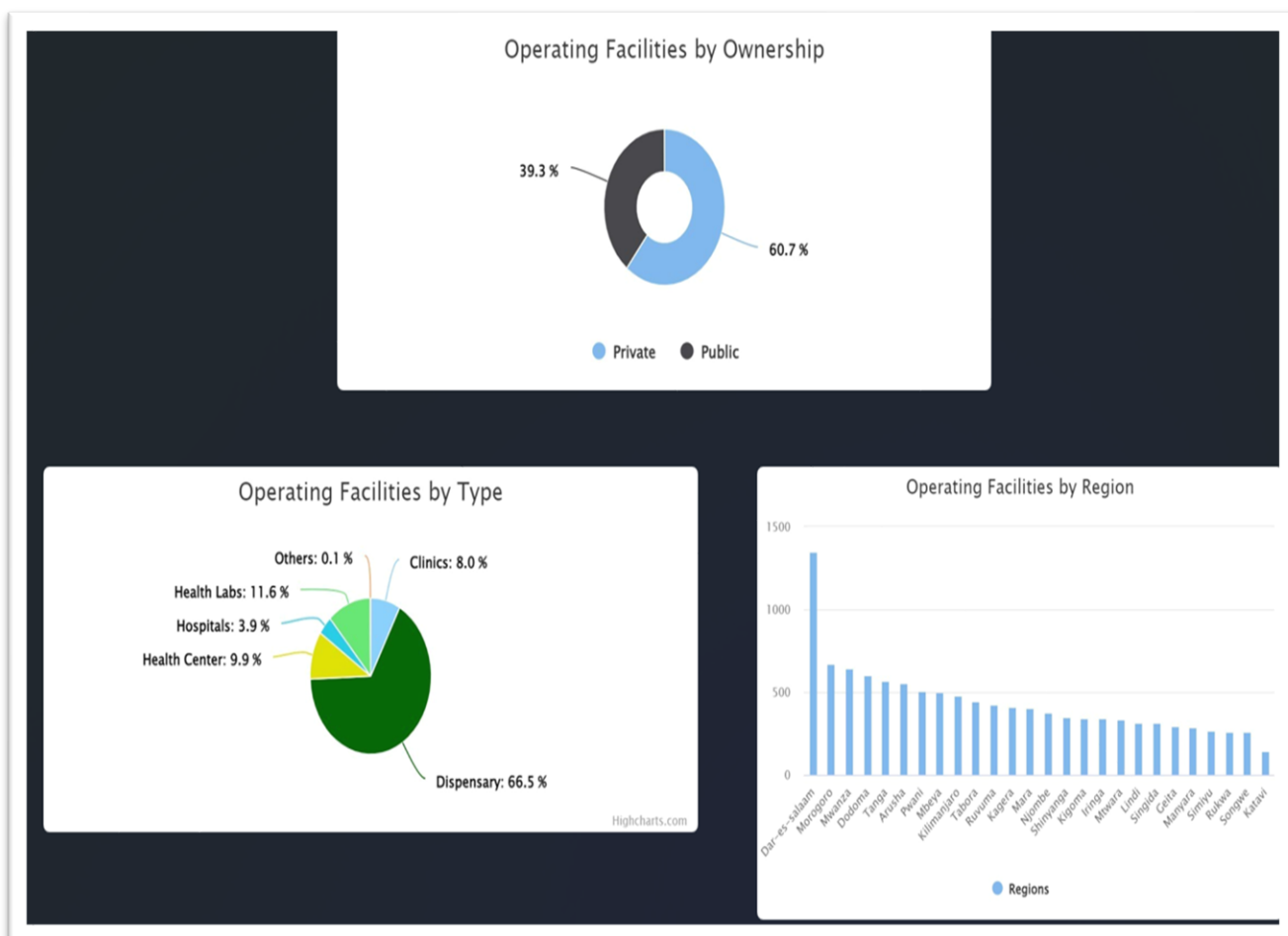


Fig 5. Operating health facilities by type, region, and ownership (43).

1.8. PRIMARY HEALTH CARE IN TANZANIA

District-level based decentralisation through LGAs gives districts control over their health budgets on a PHC level and selectively increase resources for core interventions tailored to district needs and demands (41). However, there are disparities among districts in terms of access and availability of NCD prevention and care. A study showed that only 25% of district hospitals in Tanzania provided access to NCD-specific training for health providers (49). Another study reported 20% of essential medicine in health facilities were out of stock (50). The number of essential NCD medicines that generally available are 6/10 and NCD technologies are 4/6 (51). As of April 2023, the Standard Treatment Guideline/ National Essential Medicine list (STG/NEMLIT) made some modifications on cardiovascular medications to improve their availability and accessibility at PHC levels. The modification involved change of these medications from higher to lower levels as seen in appendix 1.

1.9. COMMUNITY BASED HEALTH SERVICES

The Health Sector Strategic Plan V 2021-2026 aims to improve the health of the population by community empowerment and engagement through responsive community health system (41). The government intends to build the capacity of communities and grassroots health workers to deliver community-based and home-based care. The community-based health services will be implemented using a guideline that emphasises community-based management and participation of groups within the communities in the prevention and control of communicable and non-communicable diseases as well as environmental health. Unfortunately, the plan did not emphasise in detail how they will reduce the burden of NCDs through community-based health services (41). The community health workers (CHWs) and volunteers will be embedded in an integrated system aiming at health and wellbeing and they will be incentivised through performance-based payment modalities in this new plan HSSP V 2021-2026 (41). However, their payment modalities were not elaborated in detail.

1.10. HEALTH FINANCING

The Tanzania health system relies heavily on the funding from the national government, various sources of revenue such as taxes, National Health Insurance Fund (NHIF), improved Community Health Fund (iCHF) and Out of Pocket payments (OOPs). Although the government is still the main source it is also supported by voluntary agencies, NGOs, donors/external sources, and faith-based organizations as (figure 6) illustrates (17). International donors contribute up to 40% of the health budget. The US government through USAID and CDC contribute notably to HIV/AIDS, TB, and malaria programs that help the government of Tanzania (52). In 2020/2021 the government allocated \$387.9 million for the health sector in which \$155.5 million was allocated to development projects (e.g., re-construction and building new health facilities in underserved regions, ensuring availability of diagnostic equipment and essential medicines (53). The GoT 2022/2023 budget (\$ 442.7 million) has identified some issues of great priority, strengthening the delivery of vaccines of children under five years of age and strengthening the delivery of health services in the country (54). According to the latest 2020 World Health Organization Global Health Expenditures Database the Current Health Expenditure (CHE) as per % GDP is 3.75 and 39\$ per capita in US dollars in Tanzania (55). It is unclear how much is allocated to NCD preventive programs

as the allocated resources are shared by other diseases through the district strategic plan (56).

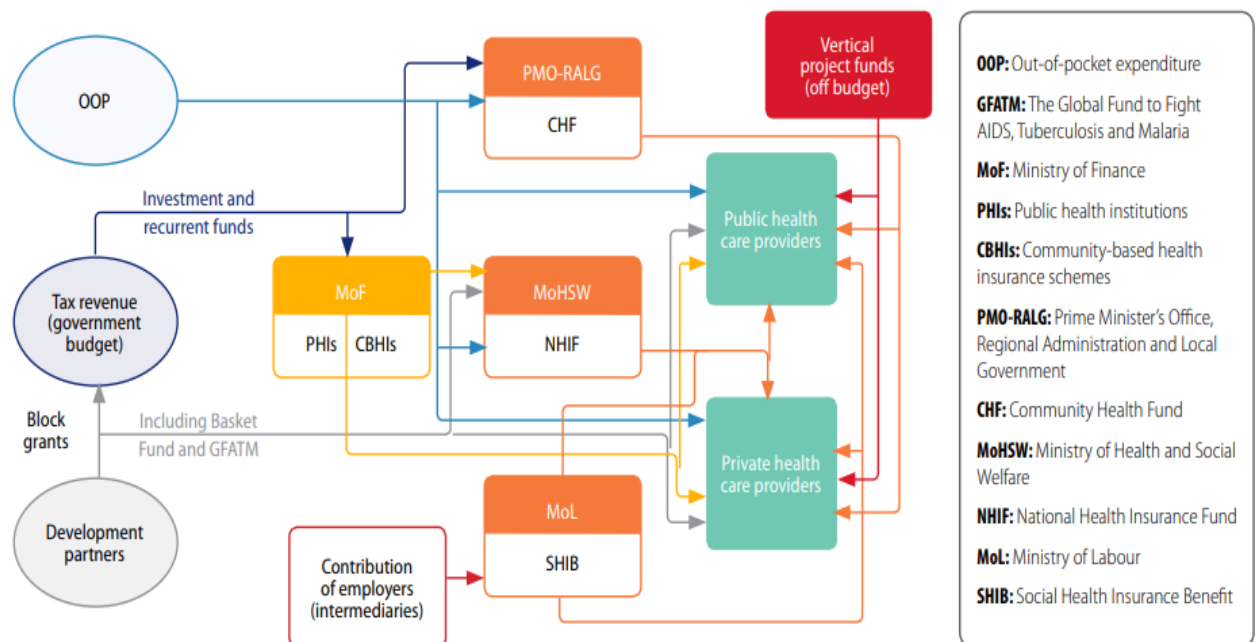


Fig 6. Current health financing structure, United Republic of Tanzania

Source: united Republic of Tanzania Health Financing Strategy (2016-2020) (45).

Prior to 2017/2018, the (GoT) spent approximately 10% of the total budget on health sectors and one- third of the resources are channelled to LGAs at the district level to fund salaries of local health workers as well as the operation and maintenance cost of district hospitals and primary health facilities. In 2017/2018, a new policy of Direct Health Facility Financing (DHFF) was instituted where all funds required for service delivery at the PHC level were directly allocated to the health facilities from the Ministry of Finance (MoF) as elaborated in (figure 7) (57). This direct decentralization of financial resources to health facilities ensures to improve health system performance through the enhancement of transparency, autonomy, and accountability at the health facility level (58). Despite, the introduction of these health financing arrangements; DHFF, complimentary funds that include user fees, NHIF, and iCHF there is still limited available financial resources at the PHC level ((59). Health insurance coverage is still low with only 32% of Tanzanians covered as of 2019 and 1% of this number are covered by private insurance (54,57).

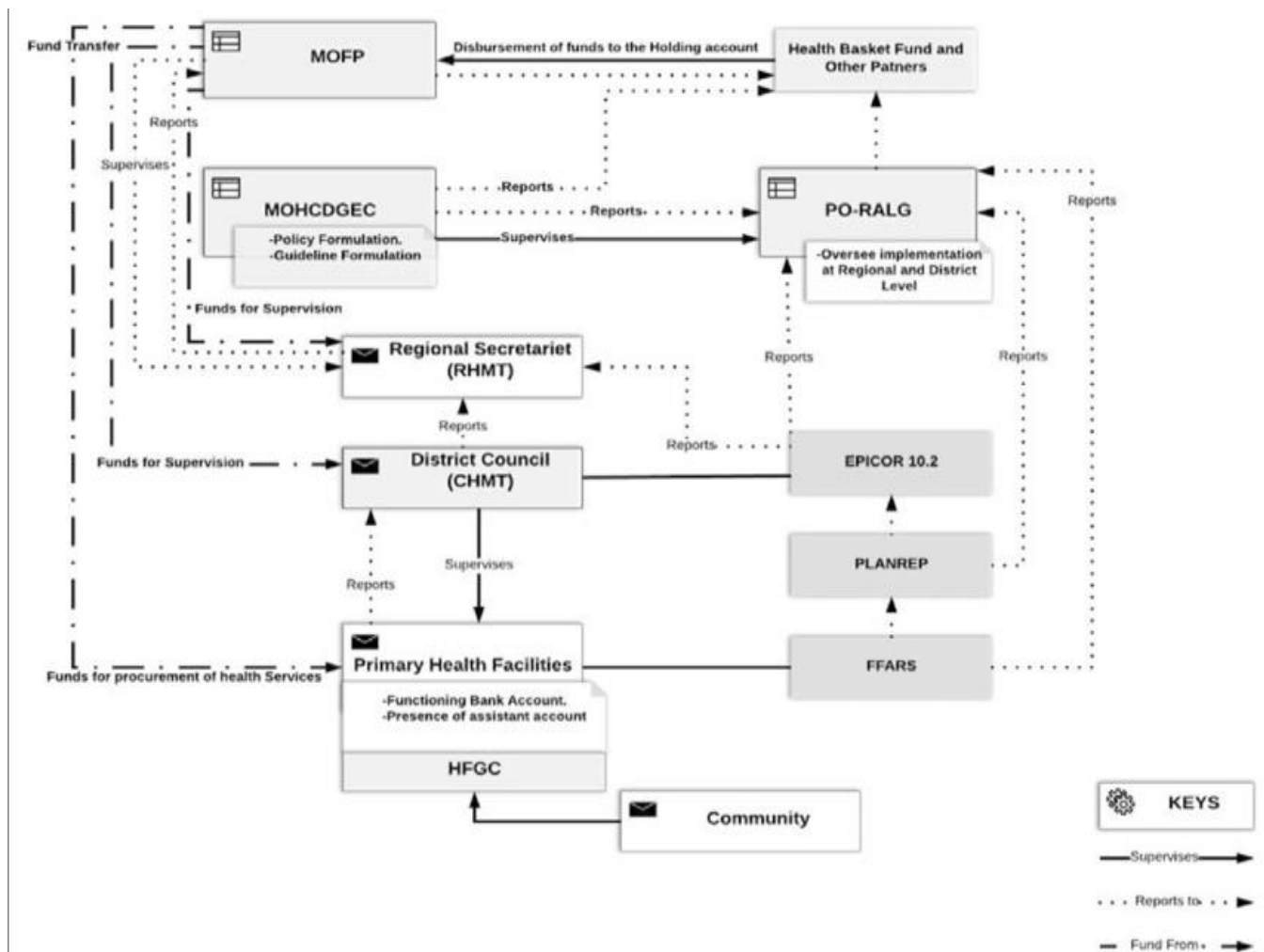


Fig 7. Direct health facility financing (DHFF) funds flow and stakeholder's relationship (57).

The Tanzanian government established a voluntary pre-payment health insurance called the Community Health Fund (CHF) in 2001 after a successful pilot in 1996 at Igunga district. In 2009, improved CHF (iCHF) was launched which was basically a rebranding with the same mode of operation as CHF. The iCHF is based upon the population at the informal sector and the memberships are based on household enrolment with the size up to six members. It is a twelve-month renewable membership. And the Local Government Authorities (LGAs) define the annual contribution of each household and vary across districts and amounts from Tanzanian shillings (Tsh) 5,000-15,000 (\$3 – 9 USD/year (9)). Through this contribution each household is entitled to basic package of preventive and curative health services at health facilities and hospitals in some districts. Regardless of the initiatives to move toward UHC through insurance schemes, the Tanzanian pre-payment is still far from achieving the 30% coverage rate. Also, iCHF coverage remains incredibly low at an 8% of the total population. These low rates can be explained from different angles; on the supply side this concerns inadequate benefit packages, poor health quality

services, a weak management and poor social marketing strategies (60). Also, socio-demographic factors determine the ability to be enrolled and re-enrol, such as participant's level of education, gender, occupation, household income, family size, marital status, and location (61).

1.11. HUMAN RESOURCES FOR HEALTH (HRH).

The World Health Organization estimates an average of 4.45 Health Care Workers (HCWs); (nurses, doctors, clinical staff, and all types of health workers) per 1000 population is needed to provide UHC (62). Tanzania has an average of 1.4 health workers per 1000 population (63) which is very low compared to the WHO recommendations. It only has 98,987 (47.53%) HCWs out of the 208,282 required to deliver quality health services. The national doctor to patient ratio is 1 doctor per 20,396 population whereas the WHO standard is 1 doctor per 1000 population (64). Moreover, there is a huge maldistribution of HCWs among rural and urban areas in Tanzania whereby 1 doctor serves 78,880 people in rural areas compared to 1 doctor per 9,095 people in urban settings (65). The department of HRH in the Ministry of Health coordinates training for health workers as a pre-service education in 190 health training institutions in the country; 77 of these training institutions are government owned and 113 are either Faith Based Organizations (FBO) or private for-profit training institutions. Tanzania is experiencing a serious Human Resource for Health (HRH) crisis with 87.5% and 67% shortages in private and public hospitals respectively (66). Also, the ongoing efforts to construct new health facilities and upgrade existing ones strains the existing shortage of HRH (67).

Major challenges related to inadequate staffing of health workers in these facilities are limited opportunities for career path, job insecurity and delay in salary/allowance payments. Whereas challenges in public facilities especially in rural or semi-urban areas are difficult working environments like (poor infrastructures, equipment, and accommodations). Tanzania government plans to integrate multi-tasking CHWs into the health system country wise. Community health workers are defined as members of the community, chosen by the community council and they provide health promotions to their communities (68). CHWs bridge the cultural and language barriers hence, expanding access to Universal Health Coverage to their communities (69). Nonetheless, CHWs in Tanzania are weighed down by a lot of barriers as they are expected to accomplish more and yet they may not have supportive

supervision, remunerations, training, supplies, transportation, and respect from both the communities they serve and the health system (70).

CHAPTER 2. PROBLEM STATEMENT, JUSTIFICATION, AND OBJECTIVES.

There is a high burden of NCDs in Tanzania in which 34% of all deaths are due to NCDs as elaborated in the background section and NCDs accounts for 28% of the total disease burden (11). Tanzania has done a great effort in increasing a lot of primary health care facilities; dispensaries, health centres, and district hospitals as explained in the background (71). The focus of strengthening PHC systems in Tanzania is to address the priority key health indicators which include reduction of maternal, neonatal, and infant mortality, family planning and adolescents' health, neglected tropical diseases, coverage of HIV/AIDS, TB, and malaria control services (41). Also, the current health plan (HSSP V 2021-2026) aims to prioritize NCD prevention and care in all health facilities. Yet, there is still no clear data on NCDs health care services coverage at the PHC facility level as compared to other chronic diseases such as HIV/AIDS coverage to be (97%, 2019) and TB (82%, 2019) according to the previous health plan (HSSP IV 2015-2020) mid-term review (41).

Tanzania, like any other WHO member state is ensuring that health services on NCD care are closer to the communities. Despite all these efforts people/people with NCDs tend to prefer services from secondary or tertiary health facilities which are regional and zonal/ national hospitals respectively. This has led to overcrowded NCD clinics in these health facilities with; poor management, overworked staff, a lot of patients with NCDs related complications and increased premature deaths (72). Therefore, this thesis aims to understand the capacity of primary health care and community health care have on providing NCD services to the communities and where capacity may be lacking. Also, I will explore the reasons why people prefer either regional or tertiary hospitals for NCD health services, because identifying factors that prevent people from using NCD care and prevention services at primary health care and community level will provide insight into weaknesses in the system and this information could help in addressing those. And lastly, I will address, what innovation or best practices can be adopted by the PHC facilities to ensure delivery of NCD care. The conclusion and recommendations of this thesis can be used to recommend contextualized interventions to the MoH and TANCDA that could improve health outcomes and reduce the burden of NCDs in Tanzania.

2.1. Overall Objectives

The overall objective of the thesis is to develop a comprehensive understanding of the reasons behind the preference of regional or tertiary hospitals over primary health facilities among individuals with NCDs and to provide recommendations for improving health outcomes and reducing the burden of NCDs in Tanzania.

2.2. Specific Objectives

1. To analyse the capacity and resources available at the PHC level for the provision of NCD services.
2. To identify the barriers and facilitators influencing NCD patients' access to PHC and community-based services in Tanzania.
3. To explore innovative approaches and best practices that PHC facilities in Tanzania can adopt to enhance the delivery of NCD services.
4. To make recommendations to the MOH and TANCDA on how to improve PHC and community health services on NCDs.

2.3 METHODOLOGY

2.3.1. Research strategy

To achieve these objectives, a literature review was conducted using peer reviewed and grey literature on Primary Health Care and community-based approaches on NCD prevention. The peer reviewed literature was found by using general Google, Google Scholar, PubMed, VU online library. Advanced search using Medical Subject Headings (MeSH) terms was used with synonym word of Non-Communicable Diseases in combination with primary health care, community-based approach, prevention, and Tanzania as illustrated in table 1. Then snowballing was done to find additional relevant articles. Grey literature was searched through published and unpublished national reports, government policy documents, demographic health surveys, NGOs reports as well as national websites; Health Management Information System (HMIS), Ministry of Health, TANCDA, and international websites; WHO, Centre for Disease Control (CDC), and World Bank.

The inclusion criteria of this study were journals/articles written in English language from Tanzania or similar in low middle income countries, SSA and published from 2008, this is because at this point the GoT started working on the National Non-Communicable Disease Strategy. Articles whose full text

were missing or articles in other languages other than English were excluded from the study. Also, papers published on countries that are not LMICs in the SSA region were excluded.

2.3.2. Dissemination of results

The findings of this paper will be presented and discussed at the University of Muhimbili Health and Allied Science (MUHAS) during an academic symposium in July 2024. After a permission from the National Institute of Medical Research (NIMR) in Tanzania I will share the findings with the relevant department at the MoH and TANCDA. At the MoH the findings will be disseminated for policy and implementation actions in line with strengthening primary health care and community-based intervention for NCDs and at the TANCDA for lobbying and advocacy actions. For publication the study will be shared with the Tanzania Journal of Health Research at NIMR and other virtual platforms.

Table1. Search strategy

Objectives	Sources	Type of sources	Keywords
Objective 1	<ul style="list-style-type: none"> • Scientific publications • Peer reviewed literatures • Grey literature 	VU library, PubMed, Google Scholar Websites, MOH, WHO, NGOs reports	Non-communicable diseases, NCDs, chronic diseases, availability, primary health care, NCD health services, resources, diagnostic equipment, essential medicines, health care workers, Tanzania, East Africa.
Objective 2	<ul style="list-style-type: none"> • Scientific publications • Peer reviewed literatures • Grey literature 	VU library, PubMed, Google Scholar Websites, MOH, WHO, NGOs reports	Non-communicable diseases, NCDs, chronic diseases, access to PHC, barriers, obstacle to NCD care, facilitators to NCD care, barriers to community health care, geographic barriers/facilitators, affordability, availability, acceptability, quality of care, Tanzania, East Africa.
Objective 3	<ul style="list-style-type: none"> • Scientific publications • Peer reviewed literatures 	VU library, PubMed, Google Scholar Websites, WHO, NGOs reports	Non-communicable diseases, NCDs, chronic diseases, CHWs, primary health care, best practice, NCD health services, Tanzania, East Africa, Sub-Saharan Africa.

2.4. CONCEPTUAL FRAMEWORK

Various conceptual frameworks relating to primary health care approach for chronic illnesses were reviewed (73). A few frameworks were found through literature review; most did not fit the context of the thesis. Therefore, the

study utilizes the conceptual model for delivering integrated primary care for chronic diseases by *Harrison SR and Jordan AM (74)*. This conceptual model for delivering integrated primary care for chronic diseases is an approach that aims to enhance the patient-provider partnership. The second partnership is between primary care provider and the community, to mobilise resources for prevention and chronic disease care that patients can access to improve their health outcomes. The construction of this model with a person-centred formulation ensures that chronic disease care is decentralised with the primary care provider located within the community.

The growing double burden of disease in SSA has led to an urgent need to move from vertical interventions to an integrated approach in delivering care for chronic diseases (75). The WHO identified primary care as the foundation for integrated chronic disease care delivery (76). In high income countries integration of chronic disease care in primary care has been implemented upon with the Chronic Care Model (CCM) by *Wagner et al (77)*. However, for LMICs in the SSA context the CCM and The Innovative Care for Chronic Conditions Framework (ICCCF) by *WHO* had some gaps (78). A new study was conducted to determine whether the current models would fit in a SSA context, and a new conceptual model was formulated (74). This conceptual model for delivering integrated primary care for chronic diseases has seven model components:

1. Improve patient access to care.
2. Foster patient-provider partnerships.
3. Ensure patient safety and care quality.
4. Empower patients for self-care.
5. Support delivery of comprehensive evidence-based care.
6. Implement effective continuity and coordination of care.
7. Develop community partnerships.

This conceptual model was found appropriate in addressing the non-communicable disease prevention in Tanzania through primary health care and community-based approaches as illustrated in (figure 8) and elaborated in table 2.

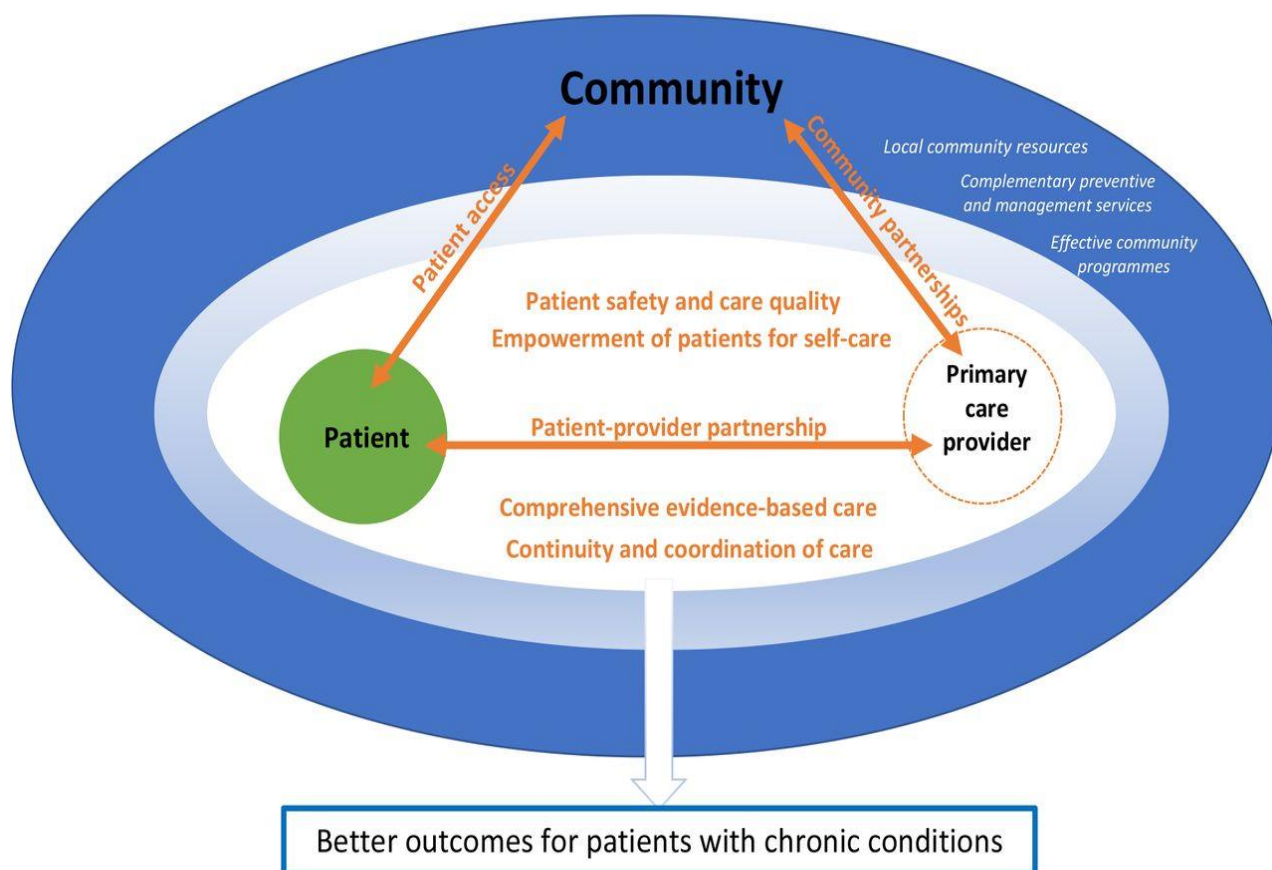


Fig 8. Conceptual model for delivering integrated primary care for chronic diseases incorporating the seven new model components. *Italic text: community resources outside of primary care (74).*

Table 2. The conceptual model for delivering integrated primary care for chronic diseases explained (74).

Model component	Person-centred formulation	Health care service delivery strategy
Patient access to care	<i>'I can access the chronic disease care I need'</i>	<ul style="list-style-type: none"> - Routine chronic care delivery is decentralised to a primary care level to improve patient access. - Available healthcare staff - Strategies to reduce patient out-of-pocket expenditure for care and medications
Patient-provider partnerships	<i>'I partner with my healthcare worker to improve my health'</i>	<ul style="list-style-type: none"> - Patient-healthcare communications encouraged to facilitate information exchange and shared decision making - Care provided is appropriate to patient' cultural background - Healthcare workers training
Patient safety and care quality	<i>'I receive safe high-quality healthcare'</i>	<ul style="list-style-type: none"> - Organisational leadership that promotes the improvement in quality of patient care - Information on monitoring and evaluation of team performance collected and used for improvement in patients care

Empowerment of patients for self-care	<i>'I am empowered with the information and resources to manage my health'</i>	<ul style="list-style-type: none"> - Patients are empowered to take central role in managing their care. - Effective self-management strategies are provided to patients
Comprehensive evidence-based care	<i>'My healthcare worker has the resources, knowledge and support to provide me with comprehensive evidence-based chronic disease care'</i>	<ul style="list-style-type: none"> - Healthcare teams are equipped with the necessary supplies, medical equipment, laboratory access, guidelines, and essential medications. - Healthcare workers have access to specialist advice, support, education, training, and retraining are delivered through programmes to facilitate decentralisation of chronic care.
Continuity and coordination of care	<i>'My healthcare worker has access to my health information to advise me effectively and to plan and coordinate my ongoing care'</i>	<ul style="list-style-type: none"> - Useful patient data are collected, organised, stored securely and are accessible to guide patient care - Patient care is continuous and coordinated through effective communication and shared information between team members as well as healthcare provider - A good referral system to ensure continuity and coordination of care
Community partnerships	<i>'My healthcare provider partners with my community to raise awareness, develop services, and increase support for chronic care'</i>	<ul style="list-style-type: none"> -Community awareness of chronic conditions is raised to reduce stigma -Local community resources are identified and mobilised to support screening, prevention, and improved management of chronic conditions -Partnerships are formed with community leadership and organisations to support patient access to care. -Complementary preventive and management services are provided where possible through mobilising informal network of providers such as CHWs and volunteers. - Patients are encouraged to take part in effective community programmes.

2.5. Study limitations

By excluding material written in languages other than English when conducting an internet search, an information bias could be created. Another drawback of this study is usage of data from earlier studies as its foundation and being guided by one framework likely led to missed scientific publications. The best practices relied on were studies done in neighbouring countries in Sub-Saharan Africa. Furthermore, it was difficult to judge the trustworthiness of grey literature.

CHAPTER 3. RESULTS

This chapter presents the study results and has been set up in accordance with the conceptual framework that was used to analyse the findings. The specific research objectives 1-3 are presented by the seven primary headings that make up this section. Headings 1-6 will discuss in detail about NCD health care services with focus on patient-provider partnership and heading seven will discuss about how the provider-community works to accelerate NCDs prevention. Throughout this chapter, the Tanzania findings will be presented followed by findings from other SSA countries.

3.1. Patient access to NCD care

In SSA, patients' access to care refers to accessing of healthcare services without any financial, cultural, or geographical barriers. This also involves the reduced of out-of-pocket expenses for care and available medications for NCDs in Tanzania (79). A comparative analysis on the catastrophic spending related to communicable and non-communicable diseases in Tanzania showed that chronic illnesses strip a person's health and their production capabilities (80). This leaves a financial burden on their household savings, income and slows investment activities, in turn households are prone to poverty. Another study done in Tanzania to assess the household economic burden brought by NCDs, revealed that despite; health insurances trying to alleviate the cost burden on chronic illnesses, there is still financial burden due to limited benefit packages of insurances and out-of-pocket spending caused by the long-term management of NCDs (81). Both studies report that people living in semi-urban, rural, or poor people who have NCDs or caring for relatives with NCDs face these financial barriers.

Task shifting has been implemented to address the shortage of HCWs and ensure access to services especially in resource constraint regions (82). However, there is limited evidence on task-shifting for NCDs done in Tanzania (83). In a study done in Kenya to evaluate the adherence of clinical protocols on five NCDs, the NCD care was shifted from clinical officers to nurses. There were 3,554 consultations performed for a total of 2025 patients of which 733 (21%) were done by nurses; of these 733 patients, 616 patients received care according to NCD guideline protocol. Adherence to hypertension protocol (64%, 397/616) were most frequent, followed by asthma (17%, 106/616) and diabetes mellitus (15%, 95/616). Only 17 (2%) of the cases were referred to the clinical officers due to uncontrollable hypertension (3), uncontrollable diabetes (7), medication side effects (4), and NCD-related complications (3) (84). The

study demonstrated that nurses working in a resource-constrained primary care were able to adhere to protocols and guidelines for managing stable NCDs patients with multiple NCDs. However, the study did not demonstrate why there was such a high adherence to hypertension protocol 64% compared to other NCDs. Having said that, the study also had some limitations as it was unable to directly compare the nurses' adherence to treat patients according to guidelines to that of the clinical officer since they managed patients with different degree of complexity.

Despite the financial barriers and an increase in out-of-pocket spending that people/ people living with NCDs face whilst accessing care from the first point of contact at the PHC level up to the tertiary level. Task shifting by NCD trained HCWs or CHWs and the availability of essential NCD services such as medicines and diagnostics at these PHC facilities will reduce the excess costs that are incurred by Tanzanians while accessing healthcare along the health system from the PHC facilities to tertiary facility.

3.2. Patient-provider partnerships

To build up on patient access to care, patient-provider partnerships improve access to care by ensuring that these health care services are acceptable by the community. For instance, patients' description of dissatisfaction towards health providers in Tanzania could stem from providers' technical incompetence (skills, reliability, assurance, confidentiality, patient engagement) and behavioural incompetence (demeanours, empathy, communication skills i.e., language and respect) (85). These kinds of malpractices contribute to poor access to healthcare service, particularly in diseases requiring ongoing therapeutic relationships like NCDs (85,86).

To explore the patient-provider partnerships, a study was conducted among 12 health facilities in both western practices and traditional healing services in the rural districts of Shinyanga region in Tanzania. This qualitative research had a total of 44 participants interviewed of whom; 36 people are living with hypertension (34 received care in the hospital and two received care from traditional healers). Five of the participants were clinicians in western care and 3 traditional healers (87). The study showed that trust in the healthcare provider/ doctor enabled patient's seeking behaviour and participation in care, as seen as well in another study done in rural Tanzania (88). The participants described that health institutions' resource availability (medicines, medical equipment sufficient doctors) create an environment where doctors/ health

providers are trusted. On the contrary some participants indicated that trust in doctors could increase patients' vulnerability to malpractice. In addition, adherence of medication (89) and return for follow-up were solely dependent on the relationship and trust between the healthcare provider and the patient (90).

Digital health and mobile health (mHealth) have been instrumental in facilitating access to healthcare in Tanzania. An estimate of around 42% of the population have subscribed to mobile services in 2018 and mobile internet penetration has quadrupled since 2010 (42). There are 3.4 million current mHealth users and 31 active m-Health services. Most mHealth services are donor-funded: Wazazi Nipendeni which translates 'parents love me' a programme that promotes maternal and child health. However, no impact evaluation of existing mHealth services for mothers and children in Tanzania could be retrieved (4,91). Success stories seen while using mHealth are evident in maternal health, since 2009, UNFPA in Tanzania has been partnering with Comprehensive Community-Based Rehabilitation (CCBRT) a disability hospital on the Mpesa Fistula Ambassador programme. The project has been successful in increasing access to women suffering from fistula to life changing surgery at CCBRT (92).

A study done to obtain the insights of using mobile health (mHealth) among CHWs, health providers and patients living with hypertension and diabetes. The aim was to overcome the lack of resources and infrastructure for health service access on NCDs in three rural districts of Dodoma Tanzania. This qualitative study had nine Focus Group Discussions (FGDs), a total of 56 participants. Community health workers were 21/56 (38%), patients 17/56 (30%) and health providers 18/56 (32%) (93). CHWs and health providers shared their concern about the text-only approach not being sufficient to elicit any behaviour change. Health providers insisted an addition of health promotion/education in the text messages. On the other hand, text messages were positively accepted by the patients. However, patients added that the sender of the text messages (mHealth) should acquire community trust in advance to communicate NCD management and education information. The study concluded that, to continue the patient-provider relationships through mHealth, CHWs should be trained about NCD managing and health promotion and improve the acceptability and sustainability of the intervention among community members.

It is evident that the people's trust towards HCWs deeply depend on their skills and the capacity these PHC facilities have on providing NCD services can facilitate on how they seek and access health care. However, I did not find specific literature on patient-provider trust relationship in relation to NCDs at the primary level. Furthermore, an intervention such as mHealth can be used in resource constraint areas as a preventive tool through health information dissemination and on the long run it can improve health literacy and awareness on NCDs. For people living with NCDs mHealth services can be used to facilitate appointment reminders and scheduling, medication adherence support and reducing the risk of complications and premature deaths.

3.3. Patient safety and care quality

Patient safety and care quality is solely linked to the patient-provider partnerships component. The GoT has a quality improvement Framework in Health Care that was first introduced in 2004 and revised in 2011. The framework aims to improve the quality of health care services through various quality improvement initiatives such as Infection Prevention and Control- Injection Safety and Standard Based Management and Recognition. However, the primary health facilities in Tanzania are not adequately prepared to manage NCDs, with lack of essential resources, guidelines and training that is detrimental to quality of care and patients' safety (94). The same was reported in a study done in Malawi: staff's knowledge on NCDs was basic and the main barriers to providing quality care were lack of medication and essential equipment, inadequate knowledge and guidelines, and lack of confidence in the primary health care system by patients. The study concluded poor quality of care is due to a lack of essential resources, guidelines, and training (95).

Patient safety and quality of care are critical for effective health care delivery through accurate diagnosis, management for individuals with NCDs, adequate medication and essential equipment as reported in these studies. Lack of these qualities result to lack of confidence in primary health care system by the people and this leads to people preferring the regional or tertiary health care facilities.

3.4. Empowerment of patients for self-care

Self-care for people with NCDs involves the active participation of individuals to maintain and improving their own health through medication adherence, lifestyle modifications, regular check-ups, screening, monitoring and symptom recognition and community support. People living with NCDs are empowered

to take central role in managing their care and are provided with suitable resources and effective self-management strategies. Under this category I will focus on the approach to self-care on patient empowerment, provider, and community involvement. In Tanzania patients' self-care is dependent on patient trust towards the provider, positive attitudes, and family support in managing NCDs (87).

A qualitative study was done in a rural community (Phalombe district) in southeast Malawi to understand how patients living with chronic conditions demonstrate their ability to self-manage their illnesses. Data was collected from 129 survey patients which included 14 In-Depth Interviews (IDI) and four Focused Group Discussions (FDG). The participants age ranged from 20-84 years both male and female. Among 129 participants 60.5% were people living with HIV, 10% were people living with HIV (PLWHIV) and other comorbidities and 29.5% were people living with NCDs (most common were hypertension 25.6%, epilepsy 7.8%, asthma 3.8% and a few had cancer or diabetes) (96). The study reported people living with NCDs took longer to seek care due to being unaware of the signs and symptoms of their conditions. The concerns of patients with multiple comorbidities (PLWHIV and NCDs) were on how medication inconsistency impacted their overall health and that could not manage their complications. Patients reported being aware of lifelong treatment of their conditions however, there were limitations to do so. Almost 40% of participants in the non-HIV (participants with NCDs) group indicated to have missed their medication in the past 30 days, in comparison to 20% in the HIV group. Availability of medication especially essential medicines for NCDs, particularly in a public primary health sector was reported to be lacking. In efforts to deal with these challenges some patients rescheduled their medications and saved some drugs for future illnesses or only took when they experienced symptoms. Some patients used herbal/traditional medicine when they discovered their drugs were unavailable at their primary point of care (96). Participants reported facing challenges in adhering to the recommended diets due to lack of household income and food shortage. Regarding physical activities, participants with NCDs and those with multiple comorbid walked for long distances as well as cycled, although these activities were due to lack of public transport and not the need for health exercises. In the event of stress, patients engaged in different activities which were either praying or attending spiritual gatherings to help them cope with their illnesses and life challenges. While people living with HIV accessed most of their health care needs at the

primary care level with the constant availability of antiretroviral drugs, people living with NCDs including HIV comorbid patients experienced difficulties in accessing care (medications or laboratory diagnostics) and had to seek care beyond primary health level (96). Self-management is inadequately practised as evidently seen among the study participants; these findings are like the one done to assess self-care management practice in Nigeria (97). Similar studies done on assessing diabetic foot care in Tanzania (98) and self-care practices among diabetic patients in Kigali, Rwanda (99), did conclude lack of knowledge on foot care/ diabetes, education level and inadequate income were barriers to participants self-managing their health. Hence, lack of self-care for people with NCDs can increase NCD related complications and premature deaths.

In conclusion, the unavailability of medication at the primary point for people with NCDs and those with multiple comorbidities as explained in the study: not only halted their treatment adherence and self-care but this could stem a distrust towards the HCWs, and primary facility as explained in the 3.2 heading and could be facilitate people's decision to go at the regional or tertiary health facility.

3.5. Comprehensive evidence-based care

Discussing comprehensive evidence-based care for NCDs in Tanzania is an important issue as it identifies the priorities of NCD management in Primary care: availability of essential diagnostic tools and medicines, UpToDate use of standardized protocols and guidelines for diagnosis and treatment (100). This section focuses on how evidence-based care is important in the prevention and care for NCDs at the PHC facilities.

A study done in Tanzania analysed the readiness of both public and private-owned health facilities: dispensaries/clinics, health centres and hospitals in a duration of one year, 2014-2015. Indicators used to assess the readiness were grouped into three domains: staff training and guidelines, basic diagnostic equipment, and basic medicines (101). Out of 1188 health facilities assessed, the majority (1013, 85.3%) were dispensaries or clinics, (864, 72.2%) in rural areas. These health facilities provided management to either one or a combination of the three NCDs assessed. Health facilities that were reported to provide management for diabetes were 619 (52.1%), hypertension 770 (64.8%), and chronic respiratory diseases 723 (60.8%). Facilities that had at least one treatment guideline related to NCD (394, 33.2%) or at least one health provider who had a refresher course on NCDs (123, 10.4%). The

availability of diagnostic equipment and medicines for these diseases were reported to be low in public health sector compared to private sectors. As discussed above, the availability of these resources fosters patient-provider relationships and shape the health care seeking behaviours of population.

Another study done to show how continuous training and retraining can accelerate evidence based NCD care. The study involved a total of 50 health centres and dispensaries which were selected from 133 health facilities in the 5 districts of Dar es salaam region in Tanzania. In recognition of the importance of effective screening and management of patients for hypertension control; the study aimed to determine the effectiveness of training through brief instructional videos on health care providers in a period of six months from February 2020 (pre-training assessment and instructional video training) to August 2020 (post-training assessment). In addition, provider interview and patient exit interviews were performed after the consultations. The pre-post assessments were done on 33 health care providers who participated in the video training workshop. Patients' observation by the researchers prior to training were 161 and 181 on follow-up. Knowledge competencies on health providers improved post-training (adequate knowledge about hypertension from 78.8% to 100%, adequate skills on blood pressure measurement from 87.9% to 97%, blood pressure thresholds for patients with diabetes, cancer, cardiac or renal impairment from 21.2% to 97% and adequate knowledge on patient lifestyle counselling and dietary measures to control hypertension from 36.4% to 97%) (102). These improved assessment criteria correlated with the improvement showed by patients in the exit interview. It concluded that clinical guidelines and care quality remains vital in screening and managing hypertension.

The Ministry of Health in Tanzania has developed NCD training manuals and has begun primary health care training in ten Regions out of thirty-one regions to facilitate patients' safety and quality of care as well as evidence based NCD care (103). Unfortunately, there was no evaluation of the impact these trainings have made. In closing, lack of continuous up to date training on NCDs for HCWs and unpreparedness of these PHC facilities are cause for why people would rather go to regional or tertiary health facilities in Tanzania.

3.6. Continuity and coordination of care

Continuity and coordination of care for people with NCDs refers to the provision of uninterrupted and well-coordinated healthcare services. In

Tanzania due to the HRH crisis clinical officers or assistant medical officers are stationed at health centres or dispensaries which are closer to the communities (104). According to the treatment guideline most of the NCD medication can be prescribed by a Medical Doctor with an undergraduate degree and above as the STG/NEMLIT states.

There are issues with continuity of care in Tanzania and communication between different healthcare levels is not always optimal. This was demonstrated by a qualitative study done in three regions in Tanzania: Dar es Salaam, Iringa, and Kilimanjaro at different healthcare levels between January and February 2020. The study aimed to explore the participants' experience and perceptions on the pathway towards clinical management of both Tuberculosis and Diabetes Mellitus (DM) in Tanzania (105). Participants in the study (> 18 years) were on TB treatment less than six months or they were diagnosed with DM and were taking both anti-TB and DM medications. The study findings revealed that participants had a positive perception on continuity of care and coordination of TB services, as they received support from healthcare providers. TB clients in the healthcare facilities had follow-up visits to the clinic and they received short messages via cell phones about their return dates and a reminder to take TB medications daily. As well as checking of TB treatment cards by the health providers, facilitated their dose completion. However, participants with dual TB/DM conditions, reported to have some difficulties in receiving management in various health facilities especially in accessing the dual TB/DM care and DM medications. The clients were referred from a primary health care to a secondary or tertiary health facility to seek further management. The referral wasn't smoothly as it was all dependent on the clients' finances; and this is one of the reasons they prefer secondary or tertiary health facilities to avoid all these costs at different health levels and yet not getting the care they desire at lower health care levels. The study also, reported that due to financial constraints, they may go without DM medications (105)

Another similar study was done, and it reported that health providers at the dispensary and health facility described diabetes services as 'pre-diagnosis', due to lack of diabetes diagnostics, or treatment services at these primary health facilities. People suspected with diabetes were referred to a higher facility level (104). Providers at the dispensary or health centre perceived to have no obligation in providing diabetic care. At a health centre a clinician

would refill diabetic medication out of sympathy to an elderly patient despite, the health centre not having a routine restocking of DM medications.

Furthermore, district-hospital providers reported not tracing the patients who failed to return for scheduled visits, their perceived reason was due to patients' limited access to financial means, and long distances to the district hospital. In addition, the district health providers could not identify missed scheduled visits as they were not systematically recorded, and health providers seemed not to be aware of opportunities for tracing patients (105) (104).

These referrals were done through letters given to diabetic patients, suspected, or known. After the referral there was no feedback given from the higher-level facility or lower-level health facilities while this is crucial in the continuity and coordination of care to patient with DM (104).

It is evident that chronic communicable diseases such as HIV/AIDS and TB have a good coordination down to the lower primary health facility compared to NCDs. NCDs are chronic diseases that due to poor or the lack of continuity and coordination could result to a lot of NCD related complications and premature death.

3.7. Community Partnerships

In this section I will highlight the importance of community partnerships in the prevention of NCDs and engagement of PHC facilities with the society. NGOs such as TANCDA and TDA have worked closely with the MOH and local governments to establish more than 150 clinics in the public sector for the prevention and control of NCDs in Tanzania (44). They provide starter kits for NCD diagnosis in all clinics, training health providers and CHWs on raising awareness of NCDs at the community level and rolling outreach screening programmes. Additionally, they have mobilised and obtained resources to expand these programmes to primary care level including healthcare centres and dispensaries. It is unclear how they are financed but they are few possibilities as they receive funding from various sources such as government grants, membership fees, donations, and sponsorships as they work with different local and international organizations.

Most Tanzanian PHC facilities are not socially accountable as exemplified in a study done to assess social accountability performance and its predictors among PHC facilities; this was based on findings conducted in a national wide reassessment in 2017/2018. The study used five social accountability indicators: functional committees/boards, display of information on available

resources, addressing local concerns, health workers' engagement with local community and involvement of community in facility planning process (106). A total of 3,032 PHC facilities (86.4% dispensaries, 76.3% public-owned and 76.0% located in rural areas). On average, 30.4% were socially accountable (i.e., 4/5 social accountability indicators), 72.0% engaged with the local communities and 65.5%, involved communities in facility planning process and 22.5% had a functional health committee. The study reported that the community was unaware of issues related to the operations or services conducted in the facilities falling in their territories at the PHC level. This could be the cause to why people choose regional or tertiary health facilities due to less information and inadequate community engagement at the PHC level (106).

To emphasis on community engagement on the prevention of NCDs, an outreach screening programme done during the Doctor marathon event done in July 2023: The community screening was focused on assessing NCDs such as hypertension, diabetes and obesity among participants who joined the marathon (107). The screening was part of a broader effort to identify and address the most prevalent health issues facing the community and to implement strategies aimed at improving overall community health. A total of 159 people participated in the screening activities, of those screened; 16.2% were obese, and 18.9% were overweight, indicating a significant prevalence of weight-related health concerns. With respect to hypertension, 4.7% of the screened individuals were already aware of their hypertensive status, but alarmingly, 16.2% were found to be hypertensive without prior knowledge of their condition. The screening results for diabetes revealed that 2.7% of individuals were known diabetics and 4.1% being newly diagnosed diabetics (107). This highlighted the importance of more proactive screening and prevention awareness programs on NCDs as they are seen to be few across the country. To conclude, these outreach programs should not be left for NGOs like TANCDA or TDA, but PHC facilities should engage their communities and in so doing the population will be aware of the services provided and the government aware of which NCD is prevalent in that community and provide with the necessary basic health services for its community.

In addition, to NCD prevention through community partnerships; the World Food Program in collaboration with Childreach Tanzania and the MoH supports different schools and households in setting up vegetable gardens (108). The aim of these programs is to instruct students to grow healthy foods that

supplement their school meals and teach the wider community about nutrition. These projects focus on addressing undernutrition in schools and households yet, these vegetable gardens do affect NCDs as they provide young people with access to regular diverse, healthy, and fresh foods. Similar results were seen on kitchen gardening at household level (109). These programs impact children and young adult in choosing healthy eating which not only addresses malnutrition but also prevents overweight and obese. In addition, health projects such as school or household vegetable gardens, show a long-term positive impact they have on the health of an individual in relation to NCDs. Sad to say, the sustainability of these programs in the country cannot be depended upon as they are always donor funded and for a given period.

Another study to demonstrate NCD prevention through community partnerships was done in three African countries; Senegal, Nigeria, and Kenya to identify potentially and adaptive advertisements (ads) that would resonate with African audiences on tobacco control. Participants were male and female from age 18 to 40 who were smokers (smoked daily in the past year) and non-smokers (who smoked < 100 cigarettes in their lifetime or did not smoke at all). A total of 1078 participants were recruited, and the final sample included 200 non-smokers and 160 smokers in Kenya, 200 non-smokers and 159 smokers in Nigeria, and 192 non-smokers and 167 smokers in Senegal (110). Five TV ads and five radio ads were chosen in collaboration with governments and partners in Africa. The study identified the *coughing child* ads on radio had the greatest resonance and potential effectiveness on African audiences. *Baby Alive* and *Lung* performed strongly on TV ads. Both highest-performing ads *coughing child* and *Baby Alive* focused effects of tobacco on the vulnerable and blameless victims such as children. Hence, these ads encouraged smokers to modify their behaviours and helped raise awareness to non-smokers on the dangers on Second Hand Smoke exposure (110). Considering the aggressive advertisements on commercial determinants of health, ads like *coughing child* or *baby alive* have shown positive behavioural change on tobacco use. Ads on sugar sweetened beverages and alcohol showing the health impacts could also provide a positive behavioural change on these NCD risk factors.

CHAPTER 4. DISCUSSION

This section discusses key findings presented to understand the reasons behind the preference of individuals with NCDs to go to regional or tertiary hospitals instead of primary health facilities. It will also highlight how various factors are linked together. The results will be discussed based on the patient-provider

approach and the community partnership as illustrated through the adopted conceptual model for delivering integrated primary care for chronic diseases. The patient-provider approach will discuss the results from: patient access to NCD care, patient-provider partnerships, patient safety and care quality, empowerment of patients for self-care, comprehensive evidence-based care, and continuity and coordination of care.

4.1. Patient-provider approach

The WHO (2015) global strategy on integrated people-centred health services 2016-2026 recommends placing people and communities at the centre of health services (111). Hence, commitment was made to leave no one behind by achieving UHC through improved service delivery and quality health services that meet the people's needs and preferences. The Tanzanian government through the Ministry of Health has prioritized expanding healthcare infrastructures which include an increase in the number of primary healthcare facilities, healthcare workers, NCD clinics, supply of diagnostic equipment and essential NCD medications in the efforts to improve access of care to her population (112). Despite these efforts the primary health facilities in Tanzania are not adequately prepared to manage NCDs, they lack essential resources, guidelines and training that is detrimental to quality of care and patients' safety (94).

Through DHFF the districts have autonomy over how their health financing and resources are allocated in these PHC facilities. Most of these PHC facilities are not prepared for the management of NCDs with inadequate essential diagnostics 4/6 and essential medicines 6/10 available, which sometimes require people to travel far up to regional hospitals for refills (104). Moreover, 20% of the NCDs essential medicines are out of stock in these PHC facilities. Furthermore, unavailable evidence-based treatment guidelines jeopardize the safety and quality of care. Only 25% of the district hospitals provide NCD-specific training to their HCWs (49). Due to the shortage of HRH nationally (63), these health facilities are understaffed and this strains on the effort to build better and trustworthy patient-provider relationships. The overload to the health providers does not provide ample time for health education on behavioural lifestyle change, complications, benefits of medication adherence and follow-up, this has implications on the quality of care and relationship with patients. Unfortunately, at the health centres and dispensaries HCWs (who are mostly clinicians and assistant medical officers) felt that they had no obligation

to prescribe medications to patients with NCDs; this could lead to people preferring regional or tertiary hospitals.

Nonetheless, the use of CHWs or nurse-led care on NCDs in Tanzania could include a role in raising awareness about NCDs, provide education on prevention and management. The CHWs will act as a bridge between the community and the healthcare system through early detection and the ongoing support for people living with NCDs. Although, the exact amount of funds allocated on preventive NCD programs is unknown and shared with other diseases in the district's strategic plan. This leads to delay in the implementation of preventive strategic plans for example cervical cancer screening strategies are packaged in the reproductive health strategic plan (56).

The WHO (2018) Framework on integrated people-centred health services explains how people experience health care events as interconnected and consistent with their health needs overtime (113). The health insurance iCHF with only 8% coverage has limited benefit packages for NCD care, and this results in most people with iCHF relying on out-of-pocket costs for long-term management of NCDs. In addition, the results show that communication barriers between patient and providers: demeaning attitudes, and language from HCWs instigates distrust in the healthcare system. Furthermore, the inadequate NCD basic health services at the PHC determines how people seek care. As a result of this distrust people seem to seek NCD health services at a late stage already with NCD related complications, and this in turn increases the burden of NCDs on the health system and contributes to premature death in the country.

This thesis presented some interesting results regarding digital health care and discussed the use of mHealth in Tanzania. With 42% and above of the Tanzanians population subscribed to mobile services in 2018, 3.4 million current users of mHealth services and 31 active mHealth services (42). In Tanzania mHealth has been successful used in maternal and child health, HIV/AIDS, and TB. This intervention mHealth on NCDs needs to improve the acceptability and sustainability among community members (93). The success of mHealth will facilitate access to care in resource constraint areas: by giving people living with NCDs the power to manage their own health through health education about their self-care and treatment options and these self-care

practices not only save money for people living with NCDs but, also the healthcare system in general (114).

4.2. Community partnerships

The WHO global strategy on NCD prevention and control, acknowledges that fighting NCDs is a priority through multi-level partnerships. A combination of the government and community partnerships in strengthening prevention and continuum of care for NCDs (115,116). NCD prevention starting from primordial to tertiary prevention requires evidence-based interventions, the WHO proposes policy interventions related to tobacco control, alcohol reduction, regulation of unhealthy foods and urban planning which promotes physical activities (117). These policy interventions are still lacking in enforcement in Tanzania as explained in the background section.

The community outreach programs on NCD screening has shown to increase early detection and community awareness on NCDs. This was reported on a doctor marathon event in Dar es Salaam with the aim to improve the overall community health (107). Through this event it depicted that there is a huge number of people are living with NCDs who are unaware of their health status. Most NCDs are silent killers, and this could explain why a lot of people seek care after NCD related complications start to show. With these complications most PHC facilities cannot manage these complications hence, they are referred to regional or tertiary hospitals. TANCDA and TDA state that there is insufficient of these outreach screening programs at the PHC level (44). This is evidently supported with only 30.4% of PHC facilities in Tanzania were socially accountable through HCWs engagement with the community, display of information of available resources and services, addressing local concerns, and the involvement of community in facility planning processes. This concludes how people choose regional or tertiary facilities because they are unaware of issues related to operations or services provided at PHC facilities.

In addition, health projects such as school or household vegetable gardens, show a long-term positive impact they have on the health of an individual in relation to NCDs. These community health projects could be incorporated in all schools in collaboration with the Ministry of Education and Ministry of Agriculture to help raise awareness on healthy foods as a preventive measure (108), as most of these programs are donor funded and for a provided duration hence lack sustainability.

Community engagement through TV and radio advertisements are immensely powerful in affecting behaviour lifestyle changes. This was positively reported in a study done in Kenya, Nigeria, and Senegal to see how TV and Radio ads affect tobacco smoking (110). This approach could be implemented in Tanzania to evoke positive behaviour change among its population on NCDs Modifiable risk factors: tobacco use, alcohol abuse, unhealthy diets, and physical inactivity. Instead of these products being advertised as feel-good products, they should include how detrimental they can be for the health of an individual. For example, processed foods should provide their nutritional requirements and how presence of unsaturated fats or sugars can cause to cardiovascular diseases or cancer just like the *coughing child* and *baby alive* ads were. This could at least help in behavioural change and people choosing their foods or beverage with a well-informed knowledge on its health effects.

Furthermore, the improved Community Health Fund uptake is 8% of the total population. This insurance scheme benefits the informal sector, and the Tanzania informal sector constitutes of the 70% of the total population (60). There is low enrolment to iCHF due to limited benefit packages and poor marketing strategies.

CHAPTER 5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusions

The prevalence of NCDs is growing and becoming a major public health concern. SSA is faced with a high burden of premature death caused by NCDs, and Tanzania is no exception. Evidence points to several factors that promote this increasing burden in Tanzania: quite a good number of Tanzanians are living with NCDs without the knowledge that they have NCDs, very limited preventive measures such as outreach screening programs, inadequate basic NCD health services (HRH shortage, essential medicines, and diagnostics at the PHC facilities) and poor access to these services are few of the reasons. Patient access to NCD care has not yet improved despite the efforts made by the GoT to prioritize the expansion of healthcare infrastructures in rural and underserved areas of the country. Most of these health facilities lack most of the basic health services needed when it comes to NCD care. In addition, the government should provide better benefit packages through the improved Community Health Fund insurance. This will alleviate the financial burden brought about when accessing health services on NCDs and in return reduce out of pocket spending for its population. To meet the growing demand for NCD care while there is shortage of health workforce; task shifting, and task

sharing can be done to optimize healthcare resources and address the shortage of specialized healthcare professionals. This intervention facilitates access to health care and was successfully implemented on NCD care in Kenya. Tanzania could also adapt this intervention on NCD care because task shifting has been implemented in maternal and child health and in HIV/AIDS and TB programs successfully.

In addition, the use of evidence-based care in the prevention and management of NCDs requires health facilities to be equipped with the required medical equipment, laboratory, access to recent guidelines, protocols, and health provider capacity building. Integration of NCDs with chronic communicable diseases such as HIV/AIDS or TB to the pre-existing close-to-community (CTC) clinics which are prevalent on a primary health level. Through the NCD strategic plan, the MOH has developed NCD training manuals for Primary health care. These trainings have started in ten regions out of thirty-one regions in Tanzania. These PHC trainings should include community health workers as it has been proven that CHWs can help with the HRH crisis and most importantly in health promotion.

The government of Tanzania should encourage more NGOs or agencies such as TANCDA and work closely with agencies that engage in fighting and raise awareness on NCDs as they seem to be few, as well as emphasis on community engagement by the PHC facilities. This involvement of community partnerships has shown to have a significant impact on NCD health awareness and prevention. Moreover, in the technological era with almost two-third of the Tanzanian population having mobile phones digital health innovations such as mHealth can pave the way for patient access to health and ensure better patient safe-care and continuum of care, whilst helping in achieving UHC and reduction on NCD incidence in the country. mHealth could be used not only for NCD care but as a tool for health promotion on preventive measures.

Most of the research gap observed in this study from Tanzania as to why people with NCDs prefer regional or tertiary hospitals was seen on the unavailability of basic NCD care in these PHC facilities, financial, cultural, and communication barriers shaping the peoples' seeking behaviours and inadequate community engagement on the prevention and management of NCDs at the community and primary health level.

5.2. Recommendations

- The MoH should implement continuous training programs to health care providers' especially at the primary level (dispensaries and health centres) on NCD management and prevention. This will improve the quality of care and patients' safety because the HCWs will be up to date with the evidence-based care.
- The TANCDA should advocate for better beneficial packages on NCD care in the improved Community Health Fund insurance and better marketing strategies that engage the audience for more people to enrol in these insurance schemes.
- The TANCDA should advocate for the implementation of the NCD data registry at health facilities to monitor NCD trends and how they impact the community. This will help the MOH make evidence-based decisions.
- The TANCDA to advocate for policy implementation about including community health workers in the health system to the department of HRH at the MoH. This collaboration with CHWs will help engage the community on promotion of healthy lifestyle behaviours and link the community members with the necessary primary health they need.
- To ensure that people living with NCDs get UpToDate evidence-based health care; TANCDA should advocate for UpToDate standard guidelines for managing NCDs, equipped diagnostic tools, and in-service training to healthcare providers to improve quality of services provided.
- Policies on CDoH should be reviewed: tobacco control, alcohol reduction, unhealthy foods laws, better infrastructure to promote physical activities for the betterment of the nation. Ban aggressive on advertising of these during children and young adults TV and radio ads.
- The MOH should encourage support groups or communities of people living with NCDs in communities like it is with HIV/AIDS champions, where they can voice their concerns and help understand their realities. Their opinions should also be included in this policy and national NCD strategic plan making.
- TANCDA and MOH should integrate NCDs into Close to Community centres which are primary vast in the communities and serve as HIV/AIDS clinics.
- The MOH should formulate policies and implementation strategies on how community-based health services will reduce the burden of NCDs in Tanzania.

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ANNEXES

Annex 1. Levels of Medicine use according to the STG/NEML

LEVELS OF MEDICINES USE

A Medicines used at Dispensaries level.

B Medicines used at Health centres level

C Medicines used at Council Hospital level

D Medicines used at Regional Referral Hospitals

S Medicines used at Zonal Referral, National and Special Hospital

1. NOTE: level A and B represent the Primary Health Care Facilities

Antidiabetic Medications

Name of the drug	Dosage and strength	levels
Glibenclamide	Tablets 5mg	A
Gliclazide	Tablets 40mg	A
Glimepiridine	Tablets 1mg, 2mg	A
Glipizide	Tablets 2.5mg, 5mg	A
Glucagon	Powder for reconstitution 10mg/vial	C
Insulin-short acting	Insulin-short acting (human) soluble 100 IU/ml	A
Metformin	Tablets 500mg	A
Pre-mixed Insulin	Intermediate and short acting insulin (70/30)	A

2. Cardiovascular Medications

Note: on 23rd April 2023 modifications on STG/NEMLIT on cardiovascular medications. The aim was to improve their availability and accessibility at the primary health facilities. The modification involved change these medications from higher level to lower level.

Name of the drug	Dosage and strength	From level	To level
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Amlodipine	Tablets 5mg, 10mg	C	B
Losartan	Tablets 50mg; Tablets in fixed combination	C	B
Hydralazine	20mg powder for injection	C	B
Furosemide	Injection 10mg/ml; Tablets 40mg	B	A
Nifedipine	Slow-release Capsules/ Tablets 10mg; 20mg	B	A

The rest of the cardiovascular medication list remained on the same levels as before.

Name of the drug	Dosage and strength	Level
Propranolol	Tablets 40mg	A
Labetalol	Tablets 100mg, 200mg	C
Bendrofluazide	Tablets 5mg	A
Atenolol	Tablet 50mg	B
Captopril	Tablets 12.5mg	B
Enalapril	Tablet 2.5mg, 5mg (as hydrogen maleate)	C
Carvedilol	Tablet 6.25mg	C

NOTE:

1. *Medications on Heart Failure begin at level C hospitals.*
2. *All Cancer medications are given at level S hospitals.*

Annex 2. The Map of Tanzania and its borders

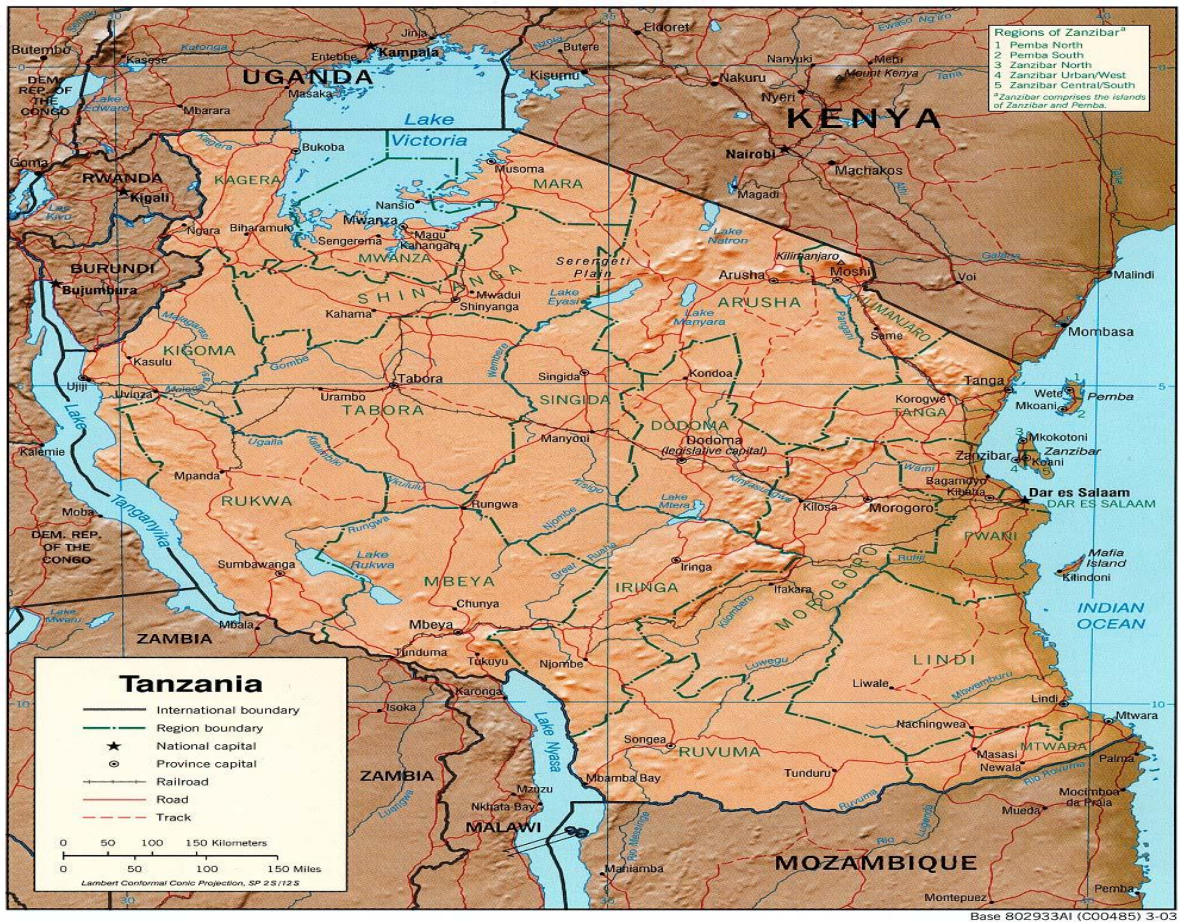


Figure 9. The Map of Tanzania (14): source Google maps

Annex 3. Map of Tanzania showing Health facilities

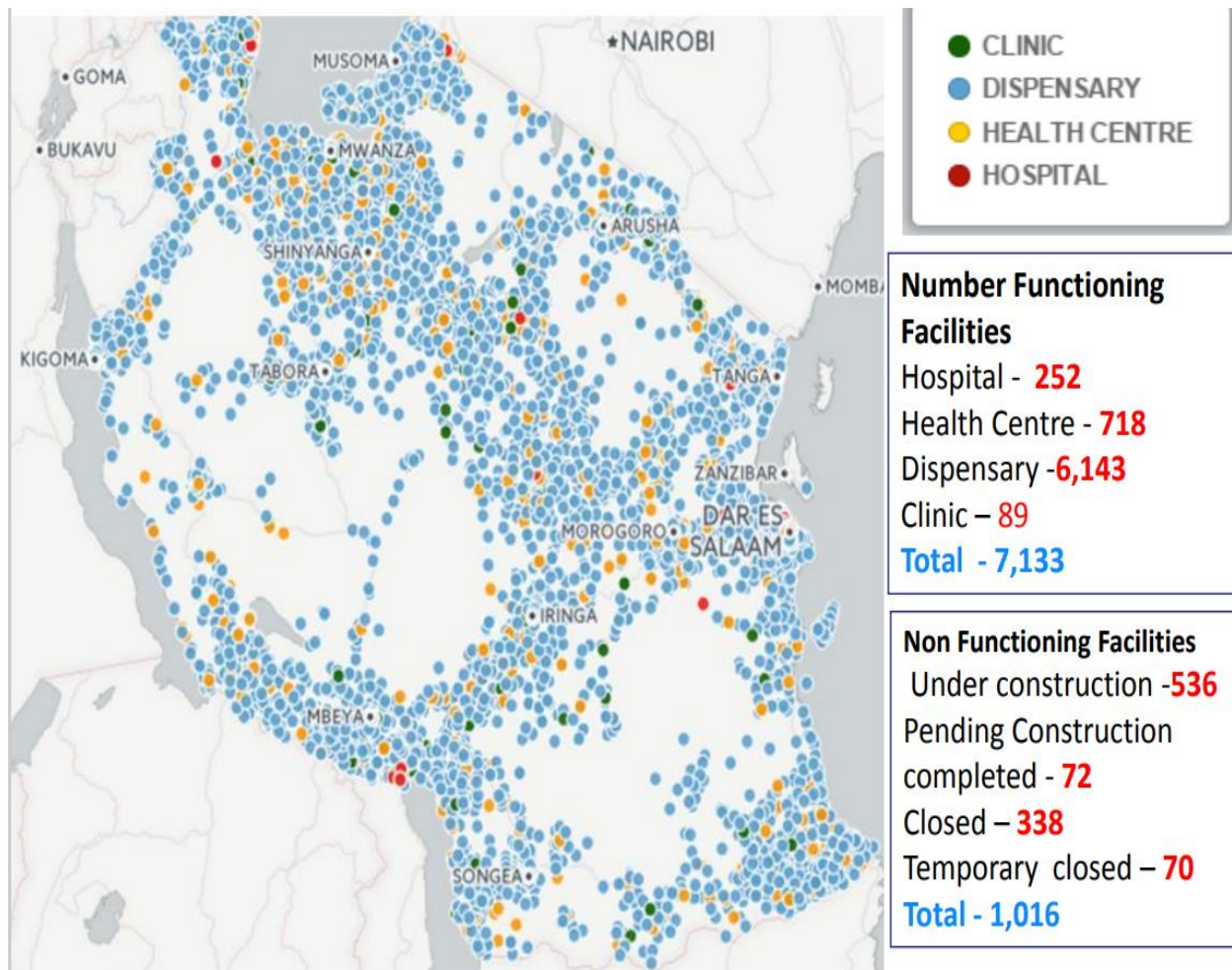


Figure 10. Map of Tanzania showing Health Facilities (9). Source Tanzania HMIS portal: 2015 Annual Health Sector Performance Report.