NACTVET

National Council for Technical and Vocational Education and Training

NATIONAL COUNCIL FOR TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING

MAPPING

HEALTHCARE FACILITIES

FOR STUDENTS TRAINING IN TECHNICAL INSTITUTIONS IN TANZANIA

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FOREWORD

Professional clinical placements for health-care students are an essential part of their academic life, allowing learners to spend time, in a professional practice environment undertaken in a workplace setting, acquiring the necessary skills, attitude, and competencies they need to become skilled health-care practitioners. Practical skills can only be learnt through a workplace learning (WPL) placement.

Placements play an important role in students' academic progression, enabling them to learn about the practical aspects of provision of preventive, curative, and rehabilitative health-care services in real hospital settings and allows students to learn by observing skilled practitioners and by doing physically what they are going to practice after school.

Hospitals and health centres are critical clinical training sites for medical and allied health-care sciences students. The enrollment of students in health-care training institutions offering certificates and diplomas has increased tremendously from 16,450 in 2014/2015 to 36,465 in 2020/2021. The growth of new health-care training institutions has further escalated the number of enrolled students. However, the current number of students in the health-care sector outstrips the availability of clinical placement opportunities.

There is a challenge of the overcrowding of students in many health-care facilities, especially in cities and municipalities in Tanzania. To address this situation, National Council for Technical and Vocational Education and Training (NACTVET) has surveyed they supply of health-care facilities, in eight regions currently considered to have a significant population of medical students, to determine the adequacy of the facilities in supporting practical health care training. Specifically, the study aimed at (i) characterizing types and thereafter qualifying health-care facilities available in the study areas; (ii) determining current levels of student enrolment in health and allied institutions (Non-degree and degree students); (iii) establishing the adequacy of health-care facilities in supporting practical training in relation to the number of institutions and students in the surveyed regions; and (iv) use recommendations from-

this study to develop an online system to promote access to information on the availability of health-care facilities related to training.

The results show that the student population (45,615) in health and allied science is more than four times the size of the available capacity of health-care facilities to provide clinical placements (10,227) in the surveyed regions. There is an increasing need to consider the effective distribution of students, the number of training institutes in association with health-care facilities and their capacity to accommodate the growing training needs of students.

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EXECUTIVE SECRETARY

LIST OF ACRONYMS/ ABBREVIATIONS

BTP	Business, Tourism and Planning
HAS	Health and Allied Sciences
SAT	Science and Allied Technologies
HTIs	Health Training institutions
CCM	Chama cha Mapinduzi
ICT	Information, Communication and Technology
FBO	Faith Based Organisation
GIS	Geographic Information System
OPD	Out-patients Department
MNH	Muhimbili National Hospital
KCMC	Kilimanjaro Christian Medical Centre
MOI	Muhimbili Orthopedic Institute
ORCI	Ocean Road Cancer Institute
DMO	District Medical Officer
RMO	Regional Medical Officer
RRH	Regional Referral Hospital
TNMC	Tanzania Nursing and Midwifery Council
USA	United States of America
MoU	Memorandum of Understanding
NACTVET	National Council for Technical and Vocational Education and Training
MoHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
HMIS	Health Management Information Systems

EXECUTIVE SUMMARY

Recently the Government of Tanzania has successfully increased healthcare infrastructure, resulting in the need to train more sector professionals. The training of healthcare sector technicians brings NACTVET and healthcare facilities together, the former as a regulator of skills development in the country and the latter as a key stakeholder in the delivery of practical training. In situations where the medical students' population is higher than available clinical placements, the admission of larger cohorts of learners may compromise standards of medical education and training. However, halting the expansion of student admissions in healthcare will limit the supply of professionals, which will impact on government efforts to improve the sector. This relationship between the supply of trainees and the availability of placements called for the mapping of available healthcare facilities in eight regions, currently considered to have a significant supply of health and allied sciences students, to determine the adequacy of the facilities in supporting effective training.

Primary data was collected through a survey tool administered online. The study's surveys were designed and transcribed as online forms and sent as links to the respondents. The GIS spatial distribution maps of healthcare facilities and training institutes were used to identify clinical placements, compared with student enrollments in the surveyed areas. Healthcare facilities were also analysed to determine if they met standard criteria as specified by MoHCDGEC.

The study established that more than half of healthcare facilities are Government owned. While Dar es Salaam houses about a quarter of all the sector's facilities, in the surveyed regions, Iringa, Morogoro and Mbeya have the least number of facilities. Two thirds of surveyed healthcare centres do not meet minimum requirement in terms of staff resources, including doctors and nurses. Healthcare facilities that do not meet minimum human resources requirement were defined by this study as "unqualified" while those meeting the standards were described as "qualified".

Qualified health centres receive four times more patients per day than

unqualified. Most non-qualified health centres have no doctors and clinical officers. The lack of well-trained healthcare workers in these facilities limits the opportunity for students to interact with well-trained staff during practical placements. In the absence of a qualified health centre, training institutions are forced to place students in the district or regional hospitals, crowding them beyond their capacity to supervise students.

The importance of the Government's role in the provision of healthcare services and training is underscored. Government facilities that constitute most of those surveyed regions, accept students for practical training, while half of surveyed faith based organisations (FBO) and private-owned health centres do not accept trainees. The majority of facilities which do not accept trainees, cited the reason being due to insufficient communication with training institutions. The lack of staff available to supervise trainees, especially in the health centres subsector, also minimizes opportunities for clinical placements.

Iringa region has the fewest placements available among the studied regions, while Dar es Salaam alone contributes to more than 40% of all available clinical placements. Dar es Salaam, Kilimanjaro and Mwanza constitute more than 60% of placements available in the studied regions. Arusha presents the best opportunity for investing in healthcare training institutes in the surveyed regions.. Dar es Salaam, Dodoma and Mwanza have the most significant numbers of students, in comparison to available clinical placement opportunities. The current population of students in health and allied sciences stands at 45,615, which is more than four times the functional capacity of healthcare facilities to provide clinical placements (10,230).

Arusha is the only region that has more placement opportunities than the number of students. Dar es Salaam has only a quarter of the placement opportunities needed compared with the number of enrolled students, other regions, such as Dodoma which only has 10 per cent of placements compared to the number of students enrolled, face similar challenges.

Improving the quality of existing healthcare facilities, especially health centres will automatically increase clinical placement opportunities for the practical training of students. This will require the allocation of enough human and non-human resources in health centres to reduce the already existing pressure associated with placing a large number of students in district and regional hospitals. There should also be enhanced partnerships between training providers and the private sector healthcare service providers in addressing the challenge of providing effective workplace learning opportunities for medical students in Tanzania. In order to help match placement opportunities to the the number of students enrolled, heathcare training institutions could also be encouraged to establish teaching hospitals. Furthermore, there should be stronger regulation of enrollment numbers in the regions with high student populations.

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This survey is result of close collaborative efforts between the National Council for Technical and Vocational Education and Training (NACTVET), health training institutions and health facilities in eight regions surveyed. Helpful guidance on survey questionnaires, processes and report writing was supervised by Dr. J.M. Oleke, Dr. M.A. Baitilwake and Dr. O.J. Mahenya. Special thanks to L. Malele for the untiring work of cleaning, manipulating and formatting data during analysis.

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1.0 INTRODUCTION

1.1 Background

Under Section 5 (1) (a) of the National Council for Technical and Vocational Education and Training (NACTVET) Act, Cap.129, NACTVET is empowered to register and accredit technical institutions capable of delivering programmes, which are approved by the same. Section 5 (1) (f) also mandates NACTVET to ensure that the quality of education and training required for the granting of awards is being met and maintained throughout the delivery of programme (s). To maintain quality assurance, NACTVET has to ensure that all technical institutions have adequate learning and teaching facilities.

Currently, NACTVET has registered a total of 430 institutions distributed across different subject boards, namely Health and Allied Sciences (HAS), Business, Tourism and Planning (BTP) and Science and Allied Technologies (SAT) (Table 1).

There are 192 registered health and allied sciences training institutions in Tanzania offering certificate and diploma level programmes.

Table 1: Registered Technical Institutions as of 15th April, 2021

S/N	Board	Number of Institutions	%
1.	Business, Tourism and Planning	155	36
2.	Health and Allied Sciences	182	42
3.	Science and Allied Technologies	93	22
	Total	**430**	**100**

1.2. Growth in Healthcare Sector in Tanzania

Over the past five years (2015 - 2020), the Government has successfully strengthened the healthcare sector by providing quality health services throughout the country for all groups, including maternal health services. This progress has seen the number of healthcare facilities increasing from 7,014 in 2015 to 8,783 in 2020, dispensaries increasing from 6,044 in 2015 to 7,242 in 2020, district hospitals increased from 77 in

2015 to 148 in 2020. This total also includes the construction of 71 new district hospitals (Daily News, 2020). In addition, the Government has continued to improve service delivery by placing medicines, medical equipment, reagents and skilled specialists in the healthcare facilities. The sector has also seen the building of 23 regional referral hospitals and the refurbishment of operating rooms, inpatient wards, outpatients (OPD) and maternal and pediatric wards. Some facilities have been supplied with state-of-the-art surgical and laboratory equipment. In addition, infrastructure investment through construction, renovation and expansion have been undertaken in 13 health training colleges (CCM, 2020).

Healthcare facilities, including hospitals, health centers, clinics, outpatient care centers, dispensaries and specialized care centers, such as birthing centers and psychiatric care centers, play essential roles in supporting the training of sector professionals. Practical workplace learning in these facilities offer students insights into a range of workplace conditions, patient care services and access to registered practitioners. The relationships between healthcare facilities and training institutions have been well defined and recognized by the accrediting body (NACTVET). The National Guidelines for Health Training Institutions and Teaching Health Facilities (2020) states that the registration of any health training school requires that an institution has its own teaching hospital/health centre or a memorandum of understanding with healthcare facilities that guides the provision of practical training. The guidelines further defines clinical placement as an arrangement in which health and allied students are placed in an environment that provides health care or related services to patients and/or the public.

1.3 Setting the Context

To address the shortage of healthcare workers, the Government of Tanzania has called on the sector's training institutions to train more professionals, which has resulted in a significant growth in student enrollment. For example, the number of registered healthcare training institutions has increased from 153 in 2014 to 192 in 2021 (Table 2). This increase in registered medical training institutions/schools has been mainly

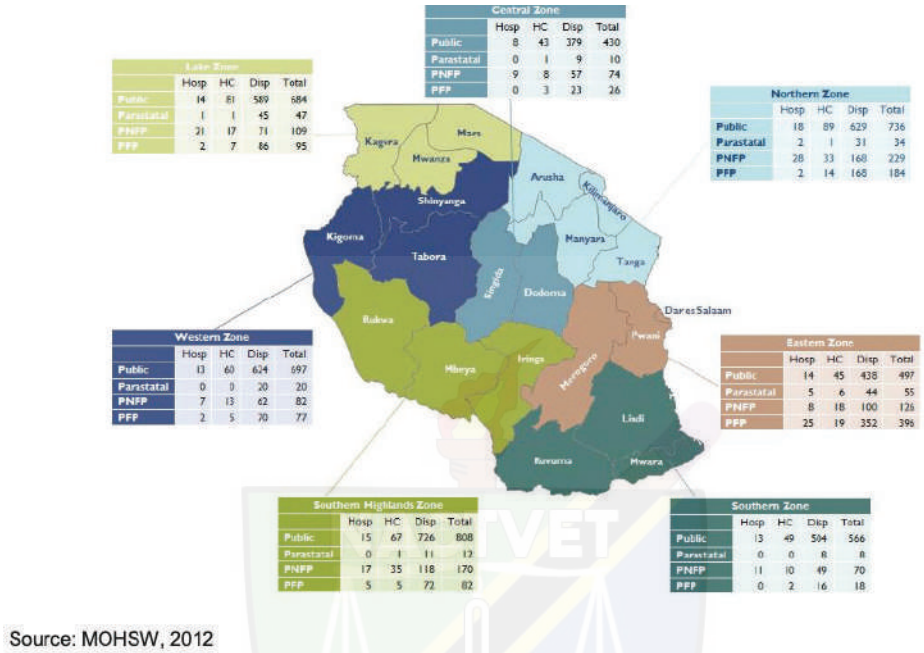
observed in regions such as Dar es Salaam, Mwanza, Dodoma, Mbeya, Arusha Moshi and Iringa. Furthermore, admission of students to medical institutions offering certificates and diplomas has increased tremendously from 16,450 in 2014/2015 to 36,465 in 2020/2021. New healthcare training institutions continue to open, further increasing the number of enrolled students. Although there has been significant development and investment in the healthcare sector, it has not been at the same rate of this growth in training centres and student enrolments, resulting in a lack of available workplace placements.

As more healthcare training institutions are opened, with a corresponding increase in the number of enrolled students, hospitals and health centres are becoming overwhelmed with the supply of students looking for practical training, especially in urban areas such as Dar es Salaam.

Table 2: Health Training Institutions

Ownership	Non Degree	Degree
Government	49	5
Private	101	4
Faith Based Organization	42	6
Total	**192**	**15**

An increase in the number of healthcare training institutions and students has resulted in rise in demand for clinical placements (MoH, 2020). This means that along with the expansion in enrollment of healthcare students, there is a need for a growth in professional training facilities. Figure 1 provides an overview of the provision of healthcare across all seven surveyed zones from 2012 (Figure 1).



Source: MOHSW, 2012

Figure 1: Demographic Health Survey

The maintenance of healthy communities depends on the provision of health care and the supply of healthcare workers. Effective training will ensure that healthcare professionals will have sufficient skills to consult patients, conduct appropriate physical examination, diagnose, recommend treatment and deliver care.

The growth of the healthcare sector presents a dilemma, if institutions admit larger learner cohorts without an adequate supply of hospitals and healthcare centers, the standards of health education delivered through work place placements will deteriorate, and students will miss the practical skills that they need to provide quality care. Yet by halting the expansion of student enrolments, the supply of professional care for large segments of the growing population will be limited.

Consequently, determining the capacity of hospitals and health centres to support practical training remains a vital responsibility of the National Council for Technical and Vocational Education and Training (NACTVET). It is envisaged that certain types of healthcare facilities will support greater training opportunities than others. This means that there is a

need for a comprehensive study to map out healthcare facilities in the areas currently purported to have large numbers of the sector's training institutions, coupled with a large student population. This study looked to understand the sector's training capacity by mapping available hospitals and health centres to training institutes and the supply of students. The information generated by mapping healthcare facilities for training in eight regions; Dar es Salaam, Mwanza, Mbeya, Arusha, Iringa, Dodoma and Kilimanjaro, will help to determine healthcare facilities clinical placement capacity. This understanding will allow for better sector planning and the identification of priority areas for new sector training institutions.

There is an increasing need to consider the effective distribution of students mapped to the number of training institutes and healthcare facilities , and the capacity of these centres to accommodate the expanding number of students. This capacity can be understood in terms of; accessibility, infrastructure, human resources, equipment, service type and use of legal agreements. The information generated by this survey, in these key areas, will help NACTVET to improve its operational tools such as regulations and guidelines for registered institutions.

The GIS spatial distribution maps of healthcare facilities will also help to increase understanding of the optimal enrolment of students and clinical placements. Moreover, this analysis will support the development of an online system to promote the accessing of information on healthcare facilities in association with their training capacity.

1.4 Specific objectives:

(i) To characterize types and qualify healthcare facilities available in the study areas;

(ii) To determine current student enrollments in healthcare and allied institutions (Non-degree and degree students);

(iii) To establish the adequacy of healthcare sector facilities in supporting practical training to the number of institutions and students in the surveyed regions; and

(iv) To use recommendations of this study to develop an online system to facilitate the access of information on healthcare facilities' training capacity.

2.0 METHODOLOGY

2.1. Survey Team and Techniques for Data Collection

Key healthcare sector stakeholders were consulted by a survey team composed of members from NACTVET, Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC), Tanzania Nurses and Midwifery Council (TNMC) and GIS and ICT experts (Table 3).

The Ministry of Health has a responsibility for; ensuring the availability and development of healthcare sector professionals, the mobilization and management of funds, equipment, infrastructure, the implementation of health plans and the provision of accessible quality health services.

Tanganyika Medical Council is mandated to ensure safe and effective practice for medical doctors and dentists. Tanzania Nurses and Midwifery Council oversees the provision, protection, promotion and preservation of public health safety and welfare through regulation and control of nursing and midwifery education and practice. These and many other bodies in the healthcare sector play important role in regulating the provision of health care and determining the supply of healthcare workers. Thus, involving these stakeholders in the survey ensured that their valuable insights were being included and their support for the study's findings and recommendations was secured.

Table 3: Survey Team

S/N	Organization	Number
1.	NACTVET	8
2.	MoHCDGEC	4
3.	Professional Bodies/Councils	4
4.	Others (ICT, GIS, Data Analysts)	4
	Total	**20**

Figure 2 shows the steps followed during the assessment of healthcare facilities in the selected areas. The process consisted of four steps: data collection, data synthesis and analysis, report preparation, and finalization. All four steps emphasized collaboration and engagement with key stakeholders to ensure accuracy and buy-in for the key findings and recommendations. Core stakeholders were also involved in data collection, analysis and report validation.

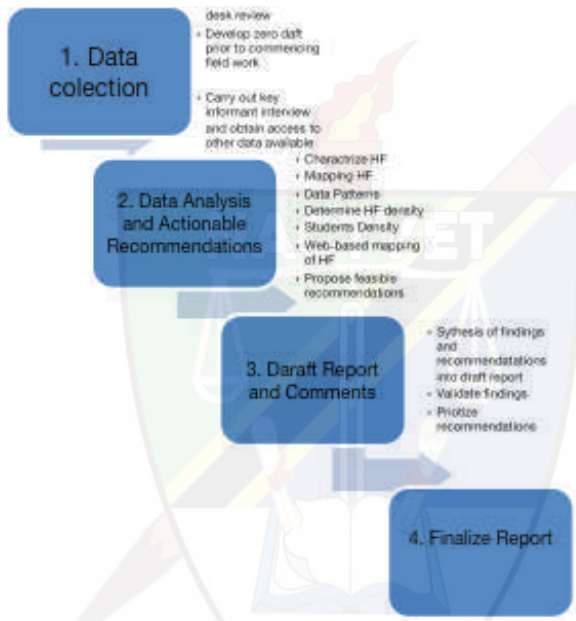


Figure 2. Assessment Steps

2.2 Data types and Sources

Both qualitative and quantitative data was sourced to achieve the survey's objectives. The GIS data was used to create geo-inforgraphic maps indicating spatial distribution of healthcare facilities, health training facilities and student enrollments. Information on; types of healthcare facilities, numbers, ownership, average patients admitted per day, number of beds and staff capacity (doctors, nurses etc.) helped to characterize the sector's capacity to accommodate and support student placements. Data gathered on student enrollment was then mapped to current placement capacity (Table 4).

Table 4: Data types and Sources

Issue(s)	Data Type	Data Sources
Characterization and mapping of healthcare facilities (HF)	• Population of all types of health care facilities (including; hospitals, health centres, dispensaries, referral units) • Location of the HF (GPS points, district and region)	MoHCDGE, interviews and secondary sources; zonal health resources centers, DMO, RMO
Facilities, staff and patients	• Average patients per day • Average patients admitted per day • Number of beds • Number of doctors, nurses etc • Number of MoUs with training institutions • Cost of services	• Interviews with hospitals, health centers, • Zonal health resources centers, DMO, RMO; • Analysis of official records maintained in the healthcare facilities • National health map; • Health facility registries and online health management information systems (HMIS); • District health information systems
Students' enrollment	• Number of healthcare training institutions • Number of students in each healthcare training institution • Students' population density (enrolments divided by places)	NACTVET, health training institutions

2.3 Spatial Mapping of Health Facilities

GIS technology and software have evolved since 2000, especially in spatial analysis and modeling of public health. For example, according to Fuad and Murad (2020), the International Health Organization in Europe proposed using GIS to detect diseases in contaminated water areas in 2003. This contributed to patient care through managing their movements and ensuring that they avoided infected areas. In addition, in 2006, the Environmental Protection Agency proposed a strategic plan for GIS to investigate a West Nile virus outbreak in Pennsylvania, USA. By studying and analyzing a number of factors that contributed to the spreading of the virus, such as; mosquitoes, blood transfusions, breastfeeding, and hospital infections, the agency succeeded in determining the origin and extent of transmission of the virus through healthcare centres using GIS.

The development of GIS technology and software has also contributed to the emergence of new healthcare planning practices, including; the monitoring of epidemic diseases, accessibility and utilization of health care, disease mapping, health information management, and allocation of healthcare resources. This survey, utilized GIS technology to map the healthcare facilities in the selected areas. This included using web-based mapping tools to collect GPS related information from healthcare facilities and training institutions, which was then used to develop geo-infrographic maps that supported this study's findings and recommendations.

2.4 Data Collection

The survey utilized both secondary and primary data. Secondary data was mainly accessed through information held by hospitals, health centres and MoHCDGE. A complete list of hospitals and Health Centers in the study areas was established from MoHCDGE sources and validated through regional and district healthcare information registrys records. The study developed two online questionnaires; one for healthcare facilities and another for training institutions. The two questionnaires were administered as online monkey survey forms/tools (Appendix 1).

Primary data was also collected through a survey tool administered online. The surveys were designed and transcribed into online forms and sent as links to the respondents. Enumerators conducted follow-up activities through phone calls and physical visits to those who had difficulty filling in the data. There were a few cases where hard copies were ccompleted, and data was consolidated later onto a common database.

Data was loaded onto the study's server to allow for analysis the identification of trends. The study undertook a data assembly process to compile a comprehensive healthcare facility database across the selected areas between 2012 and 2018. This was done through online searches and downloads of data managed by the MoHCDGE, such as the National Health Map, health facility registry data and online Health Management Information Systems (HMIS), including District Health Information Systems. On the occasions when the MoHCDGEC sources did not have comprehensive lists of facilities or maps, other government agencies were

consulted.

According to secondary sources, the population of healthcare facilities (hospitals and health centers) in the eight (8) selected regions was 501 while the total number of health training institutions was 87.

Similarly, information related to the number of health training institutions and their capacity in terms of; number of student enrollments, infrastructure, teaching and learning equipment/facilities was collected through an online survey. A total of 513 healthcare facilities (Table 5) and 87 health training institutions (HTIs) were surveyed from the eight selected regions.

Table 5: Distribution of Surveyed healthcare facilities by Regions

Region	Health Center	District Hospital	Regional Referral hospital	Specialized Hospital	National and Referral Hospital	Total
Arusha	59	12	5			76
Dar es Salaam	50	23	22	7	2	104
Dodoma	36	10	1	2	1	50
Iringa	30	9	1			40
Kilimanjaro	51	17	1	1	2	72
Mbeya	29	18	1		1	49
Morogoro	33	13	2	1		49
Mwanza	51	15	6		1	73
Total	**339**	**117**	**39**	**11**	**7**	**513**

2.5 Data Analysis

The healthcare facility database was developed through a systematic and iterative process of data assembly from various sources, including; data abstraction, geo-coding and technical validation of the data. Arc GIS enabled the study to interlink various sources to produce cross-referenced geo-inforgraphic maps. The analysis also involved comparisons and matching of various variables described in Table 4 This matching enabled the cross referencing of various variables/data to support an accurate interpretation of the survey's findings and results. Results were

then presented through tables, graphs and geo-informatic maps.

2.6 Quality of Data

An online questionnaire was piloted in several healthcare facilities before the survey link was shared with medical officers in the target regions and districts. The regional and district medical officers shared the link to healthcare facilities responsible for completing the online questionnaire. Follow-ups were then made, especially to those who had not responded within the allocated time. A total of 513 health-care facilities and 87 health training institutions (HTIs) were targeted and surveyed by the study.

2.7 Qualitative Information

The survey team conducted interviews with key healthcare personnel, including; nursing officers, medical doctors and health secretaries, about their experiences of engaging with student placements. This helped the team to capture some additional information that was not included in the questionnaire, such as; the role of health officers in handling students under clinical placement, adequate facilities to accommodate the needs of students during placement and the motivation of clinical instructors.

2.8 Workplace Learning for Medical Students

Workplace-based learning, also termed as 'situational learning' may be defined as a learning experience which allows students to learn through supervised application of their professional roles in real workplace settings. Healthcare facilities provide an ideal platform for students have an opportunity to apply knowledge in practice and develop their professional competence. If properly planned and resourced, it can also significantly increase student motivation, help to build their confidence in patient interactions and imbue them with the value of reflection and self-appraisal. The implementation of curricula, in Tanzania, requires that all healthcare students receive practical training experience.

3.0 ESTABLISHING CRITERIA FOR MAPPING OF HEALTH FACILITES

3.1 Health System in Tanzania

Tanzania's healthcare system is based on a government structure which includes different levels of services. The system is based on a hierarchical pyramid, on top of which there are consultant hospitals. Classification of healthcare facilities is mainly dependent on the staffing level and population of an area.

Table 6: Criteria for Mapping Health Facilities

Type	Requirements
Consultant Hospital	-Has special departments, medical specialists, teaching and University clinics
Regional Hospitals	1 hospital for every region/1 million population, medical specialists, experienced general doctors, medical assistants, schools for medical assistants, small departments of specialization, hospitals for referring patients to referral hospitals.
District Hospitals	1 bed per 1000 inhabitants 2-4 doctors, medical assistant, there are no special departments, 1 district: Population from 100,000-200,000.
Health centre	1 health centre, per 50,000 inhabitants. Desirable: 1 doctor, senior medical assistant who has finished his additional studies as a leader, medical assistant, co-workers for preventive health work, release and delivery stations, midwives, nurses, laboratory assistant, supervision of the dispensaries, vaccination, mother-child-clinics, possibilities for inpatient treatment, about 20 beds
Dispensary	Medical assistant, curative and preventive work, nurses, release and delivery services, vaccination, mother-child services. Private dispensaries can be registered and recognized by the state if they have a doctor or an assistant medical officer.

3.2 Staffing Levels

To support the mapping and determining the adequacy of healthcare facilities in supporting the training of healthcare students, this study utilised the 'Health Sector Staffing Levels Guidelines' 2014 – 2019. The guidelines facilitate planning and deployment of human resources to ensure the skills mix for quality health service delivery within healthcare facilities, quality sector education and training and the application of efficient managerial and regulatory practices.

The guidelines were developed in response to the National Health Policy, the third Health Sector Strategic Plan 2009 – 2015 (HSSP III) and the Human Resource Strategic Plan 2008 – 2013. The staffing guideline outlines recommendations for various levels and sub-sectors (Table 7), including for; health centers, district hospitals, regional referral hospitals, national and referral hospitals, including: Muhimbili National Hospital (MNH), Kilimanjaro Christian Medical Centre (KCMC), Bugando Medical Centre, Mbeya Referral Hospital, Muhimbili Orthopaedic Institute (MOI), Ocean Road Cancer Institute (ORCI), Mirembe Mental Hospital and Kibong'oto Hospital.

Table 7: Staffing Levels for Health Centers, District and Referral Hospitals.

	Health Centers		District Hospital		Regional Referral Hospital	
Cadre Needed	**Minimum**	**Maximum**	**Minimum**	**Maximum**	**Minimum**	**Maximum**
Specialist	0	0	0	0	21	24
Medical Doctor	1	1	8	23	20	30
Assistant Medical Officer	1	1	16	39	23	23
Clinical officer	2	3	0	0	0	0
Dental Officer	0	0	1	1	2	3
Assistant Dental Officer	0	0	1	2	3	4
Dental Therapist	1	0	1	2	2	4
Nursing Officer	0	1	12	24	30	37
Assistant Nursing Officer	1	2	16	34	77	131
Registered Nurse	9	13	33	41	91	137
Health Laboratory Scientitist	0	0	0	0	1	1
Health Laboratory Technologist	1	1	3	4	8	10
Assistant Laboratory Technolist	1	2	2	4	6	10
Pharmacist	0	0	1	2	1	4
Pharamceutical Technologist	1	1	2	3	3	5
Assiatant Pharmacetical Technologist	0	1	1	8	5	14
Environmental Officer	0	0	0	0	1	1
Assistant Environmental Officer	1	1	2	3	2	4
Total	**19**	**27**	**99**	**190**	**296**	**442**

3.3 Placement of Students in the Clinical Areas

Requirements for establishing health and social welfare training institutions, as a general set of rules and procedures, are articulated in the 'Basic Standards for Establishment of Mid-Level Cadre in Health and Social Welfare Training Institutions'. The guidelines outlines standards for the establishment of healthcare training institutions and student placements during practical training. This takes into consideration the capacity of healthcare institutions to effectively train students, including through the doctor-nurse and students' ratio, infrastructure, number of beds, patient population, student-patient ratio, distance from training institu-

tions to the healthcare facilities (15 - 30 km radius) and location of the healthcare facilities for training recommends a ratio of 1:8 for clinical, dental, pharmacy and laboratory technology students, while for nursing students, the recommended ratio is 1:4. (Table 8).

Table 8: Instructor to Students Ratios

Cadre	Numbers of Students	Source
Medical Doctor	8	MoHCDGEC
Nurses	4	TNMC
Dentist	8	MoHCDGEC
Pharmacist	8	MoHCDGEC
Laboratory Technologist	8	MoHCDGEC

3.4 Factors Affecting Clinical Placements

The determination of the number of students that can be trained in any healthcare facility depends on several factors related to clinical learning opportunities, including; the available number of clinical practitioners and instructors for supervision, appropriate equipment, patients and space.

Patient involvement in healthcare students' learning is essential in providing practical opportunities to experience clinical reasoning and practice. These crucial learning opportunities are increased when students meet several patients.

The environment where medical students learn clinical practice, especially in sub-Saharan African settings, is challenged by a multitude of factors which can adversely affect learning, including; at an individual level (student factors), hospital environment, social-economic factors, and instructional factors (Markkanen, and von Bonsdorff, 2003; Helena et al., 2019).

In Tanzania, a number of studies have concentrated on assessing the factors that influence academic performance of nursing students. Masenga (2015) reported that factors resulting in low academic performance in nursing examinations in Certificate and Diploma Programmes include insufficient personnel for clinical teaching and lack of student supervision.

Similarly, Gemuhay et al., (2021) reported that shortage of hospital staff negatively affected the clinical supervision of 89.6% of Tanzanian students. This challenge was further increased due to a lack of equipment for performing hospital procedures, a lack of well-equipped skills laboratories and inadequate beds.

Traditionally, access to patients has supported the delivery of bedside teaching (Klein et al, 1999), in addition, more modern approaches to instruction have emphasized the role of patient interaction in enhancing vital communication and consultation skills. Access to patients doesn't just contribute to practical skills but also to the development of student attitudes toward patients in personal and professional capacities (Jha et al, 2009). It is clear that the opportunity for practical training that promotes interactions between healthcare students and patients bring unique considerations to the educational experience (Jones and Rai, 2015). In their study of the perception of patients and medical students towards each other in the setting of patient care in South Africa, Menezes et al. (2020) recommended a student patient ratio of 1:8.

This study therefore concentrates on factors in determining the adequacy of clinical placement availability to student numbers. These factors include issues with doctor – nurse - student ratio, infrastructure, number of beds, patient population, student - patient ratio, distance from training institutions to healthcare facilities and location of healthcare facilities. In the absence of set Tanzanian standards for patient - students ratio, this study utilizes the student- patient ratio established by Menezes et al. (2020) to determine optimal placement of students in the surveyed healthcare facilities. Findings of this assessment are presented in the subsequent sections.

4.0 FINDINGS

This findings section begins (4.1) by showing the distribution of health-care facilities in the studied areas. Section 4.2 describes features of the surveyed healthcare facilities and their corresponding levels of qualification status. Findings on the determination of clinical placement opportunities for healthcare students, including in relation to student enrollments, are also presented.

4.1 Distribution of Health Facilities by Region and Ownership

The Tanzanian health-care system is arranged in a hierarchical structure. The first level of healthcare is conducted through dispensaries, located in every village and health centres established in every ward as described in the Primary Health-Care Development Program (2007–2017). Higher up in the healthcare hierarchy are the district hospitals, regional referral hospitals, zonal referral hospitals and national hospitals. There are some specialized hospitals, e.g. the Ocean Road Cancer Institute, Kibong'oto hospital and Mirembe Psychiatric Hospital.

The studied regions represent two-thirds of Tanzania's healthcare facilities and over half of the country's mainland population. As expected, most facilities are Government owned (more than half), followed by private sector ownership (Table 9a). Dar es salaam, the most populous city in the country, hosts about a quarter of all healthcare facilities compared to other regions studied. Iringa, Morogoro and Mbeya have the least number of facilities. The population of Dar es Salaam (approximately 6 million) is more than all three regions (Iringa - 1.12 million, Mbeya - 2.14 million, and Morogoro - 2.66 million) combined (NBS, 2019). Most of the Government owned healthcare facilities have more capacities in terms of human resources, infrastructure and serve more patients compared to the private health-care sector.

Table 9 (a): Total Number of Health Facilities in Studied Regions

Region	Government	Faith Based Organization (FBO)	Private	Total
Arusha	45	20	11	76
Dar es Salaam	35	15	54	104
Dodoma	42	6	2	50
Iringa	25	5	10	40
Kilimanjaro	39	20	13	72
Mbeya	34	7	8	49
Morogoro	32	10	7	49
Mwanza	46	8	19	73
Total	**298**	**91**	**124**	**513**

This demonstrates that the government is the largest provider of health-care services in the country with about two-third (67%) of health centers being state run. The Government also owns 71% of national and referral-hospitals, while most specialized hospitals are owned by the private sector (Table 9b).

Table 9(b): Distribution of Health Facilities by Ownership

HF Type	Government (%)	Private(%)	Faith Based Organization (FBO(%)
Health Center	67	19	14
District Hospital	42	27	31
Regional Referral hospital	33	56	10
Specialized Hospital	27	64	9
National and Referral Hospital	71	0	29
Total	**58**	**24**	**18**

4.2 Qualification of Health care Facilities

Clinical placements for students are an essential part of their academic programmes. It is a highly valued part of a student's academic and professional development in allowing them to develop a practical working knowledge of their profession, whilst providing a medium through which to combine theoretical knowledge and practical skills. The quality of training also plays an important part in students' academic and professional development. This means that trainees should get the highest quality of the training through exposure to a range of healthcare resourc-

es and professional practitioners.

To explore this important area, this study has used MoHCDGEC quality guidelines for healthcare facilities to assess their capacity to support quality clinical placements and training. These guidelines have established the minimum human resource requirement including doctors and nurses, for each level of healthcare facility. In this study, facilities that do not meet minimum human resources requirement were defined as "unqualied" while those meeting the standards are described as "qualified".

While it is apparent that health centres can provide professional environments for student placements, about two-thirds of surveyed centres do not qualify in terms of human resources, including doctors and nurses. While in the past five years, the United Republic of Tanzania has promoted and developed the sector by investing in establishing health centres, many of them have insufficient staff resources, limiting the opportunity for effective practical training experiences. In the absence of a qualified local centre, healthcare training institutions are forced to place students in the district or regional referral hospitals (RRH) where they believe there are more opportunities for students to learn. This often leads to overcrowding of student placements at the hospital level, this challenge is further increased due to the fact that most privately owned RRH also do not qualify (Table 10).

Table 10 : Qualification Status by Ownership

Type of HF	Government		Faith-Based Organization (FBO)		Private	
	Qualified	Unqualified	Qualified	Unqualified	Qualified	Unqualified
Health Center	75	153	19	29	28	35
District Hospital	13	36	3	33		32
Regional Referral Hospital (RRH)	13	-	3	1	8	14
Total	101	189	25	63	36	81

As reported earlier, only qualified healthcare facilities can offer the best environment for practical training. Most of the health centers (35) in Dar es Salaam qualify, (Figure 3). In addition, with the exception of the Morogoro region, most of the health centers in other surveyed regions do not

qualify, similarly, the majority of district hospitals do not qualify.

Fewer qualifyied healthcare facilities translates into student overcrowding and fewer opportunities for quality training experiences. To mitigate this risk requires proper planning and centralized alignment to utilise the existing qualified facilities. This implies the need for establishing requirements for each level of training and matching associated availability in healthcare facilities (regardless of qualification status) to support the optimum placement of trainees to these facilities. This matching process could be further facilitated through the building of a real-time database that provides information necessary for efficient placement of trainees.

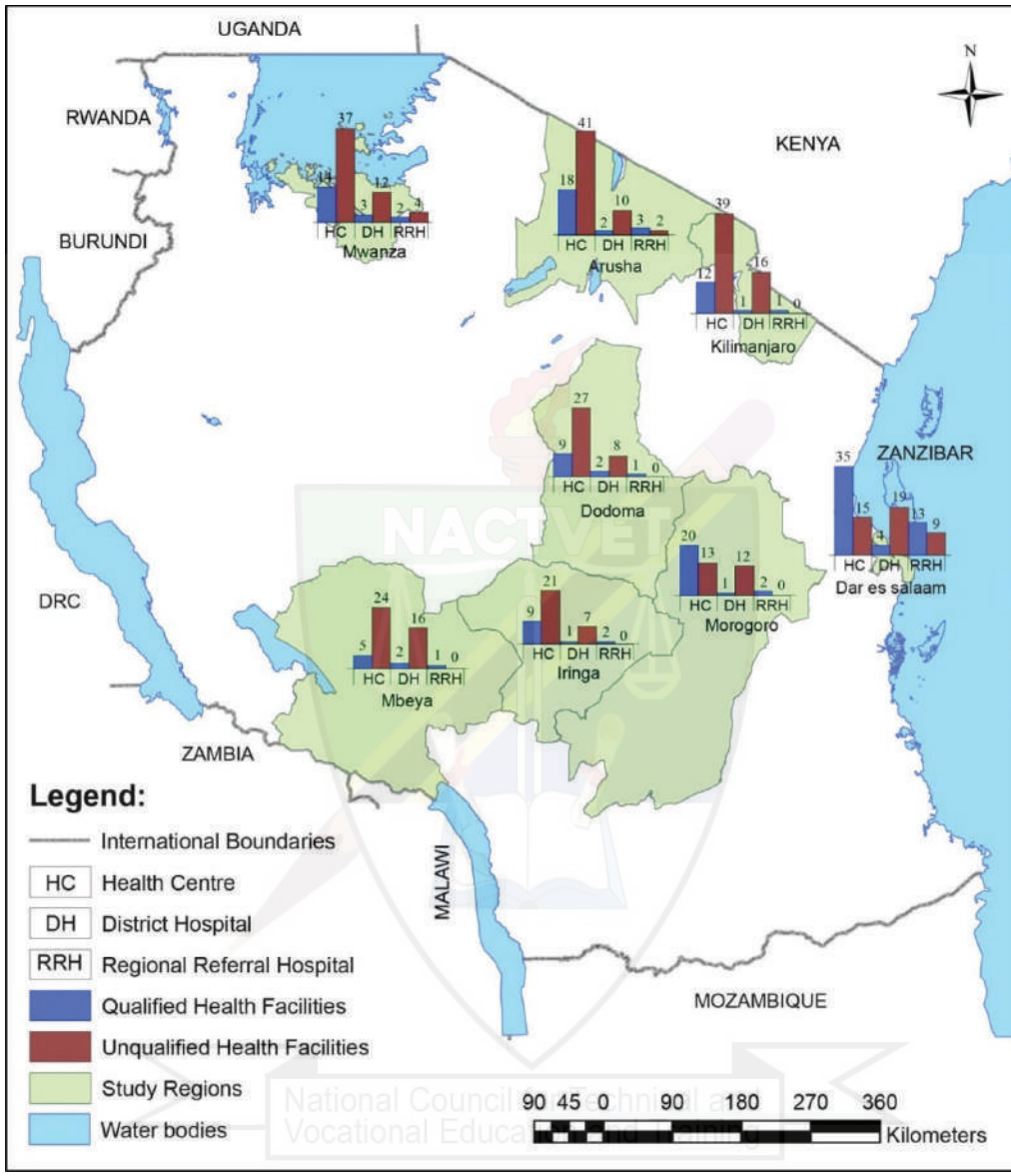


Figure 3: Distribution of Health care Facilities (Qualified and Unqualified) in the Study Areas

4.3 Features of the Surveyed Health Facilities

There was significant variation between the number of beds in qualified and unqualified facilities, with the average number of beds in unqualified regional referral hospitals, which are normally privately owned, being 50, compared to qualified (Government) hospitals average of 234. A similar observation can also be made in regards to the reported number of out patients in qualified facilities. Regardless of types, five times more patients attending qualified facilities than unqualified (Table 11). Unqualified health centres receive an average of 38 patients per day while qualified, on average, admit four times as many (138) patients per day. In addition, qualified district hospitals, which are mainly government owned receive about three times the number of patients than non-qualified hospitals.

Table 11: Features of Health care Facilities Surveyed

Features (Average)	Health Centers		District Hospitals		Regional Referral Hospital	
	Qualified	Non-Qualified	Qualified	Non-Qualified	Qualified	Non-Qualified
Number of Wards	4	3	6	6	11	7
Number of bed capacity	33	21	140	85	234	50
Number of functional beds available	31	19	129	72	216	35
Number of out - patients attended per day	134	38	320	93	540	110
Number of patients admitted per day	9	5	45	14	43	7
Number of In-Patients per day	16	7	83	30	106	11

Furthermore, qualified regional referral hospitals receive more than five times (540) patients in comparison to unqualified. There is a clear correlation between the quality of the hospital and the number of patients seeking treatment. The large number of unqualified centres mean that even in regions where there are a large number of healthcare facilities, such as Dar es Salaam and Mwanza, many of them do not qualify in providing opportunities for clinical training.

4.4 Staffing Level in the Surveyed Healthcare Facilities

It was also found that unqualified healthcare facilities faced significant challenges in regards to the standard staff resources requirements (Table 12). For example, the minimum requirement for a health centre is 1 doctor and 10 nurses while district hospitals must have a minimum of 8 doctors and 29 nurses. However, as shown, most unqualified health centres do not have enough doctors and clinical officers, with an average of 0.9 and 0.8, respectively. Similarly, most unqualified district hospitals' have an average of only 5.3 doctors and 21 nurses compared to the minimum requirements of 8 doctors and 29 nurses. It is, thus, apparent, the staffing challenges faced by unqualified healthcare facilities will reduce the opportunity for students to interact with well-trained practitioners during practical work placements.

Table 12: Staffing Levels in Health Facilities

Staff (Average)	HC (Total)			DH (Total)			RRH (Total)	
	Standards	Qualified	Unqualified	Standards	Qualified	Unqualified	Standards	Qualified
Medical Doctors	**1**	2.8	0.9	**8**	11.2	5.3	**20**	41
Clinical Officers	**2**	2.6	0.8	**0**	8.9	2.2	**0**	9
Dental Officers	**0**	0.2	0.0	**1**	0.9	0.2	**2**	2
Assistant Dental Officers	**0**	0.7	0.1	**1**	1.6	0.6	**3**	2
Nursing Officers	**0**	1.5	0.2	**12**	7.2	2.3	**30**	23
Assistant Nursing officer	**1**	9.4	2.2	**16**	36.5	9.6	**77**	86
Enrolled Nursing Officer	-	9.5	2.4	-	37.0	9.3	-	84
Pharmacists	**0**	1.1	0.3	**1**	2.4	1.0	**1**	5
Laboratory technologists	**1**	3.1	1.0	**3**	6.2	1.8	**8**	16
Environmental health Officers	**0**	0.7	0.3	**0**	2.7	0.8	**1**	2

4.5 Role of Patients in Healthcare Training

Patient interaction plays an important role in healthcare training, providing an opportunity for students to develop critical professional skills and competencies. Figure 4 maps the distribution of patients in the surveyed regions. Healthcare facilities in Dar es Salaam, Kilimanjaro, Arusha and Mwanza regions receive more patients than others. This distribution could be attributed to the fact that these regions have more health facilities and human population than the others. Conversely, health facilities in Iringa receive fewer patients than the other surveyed regions.

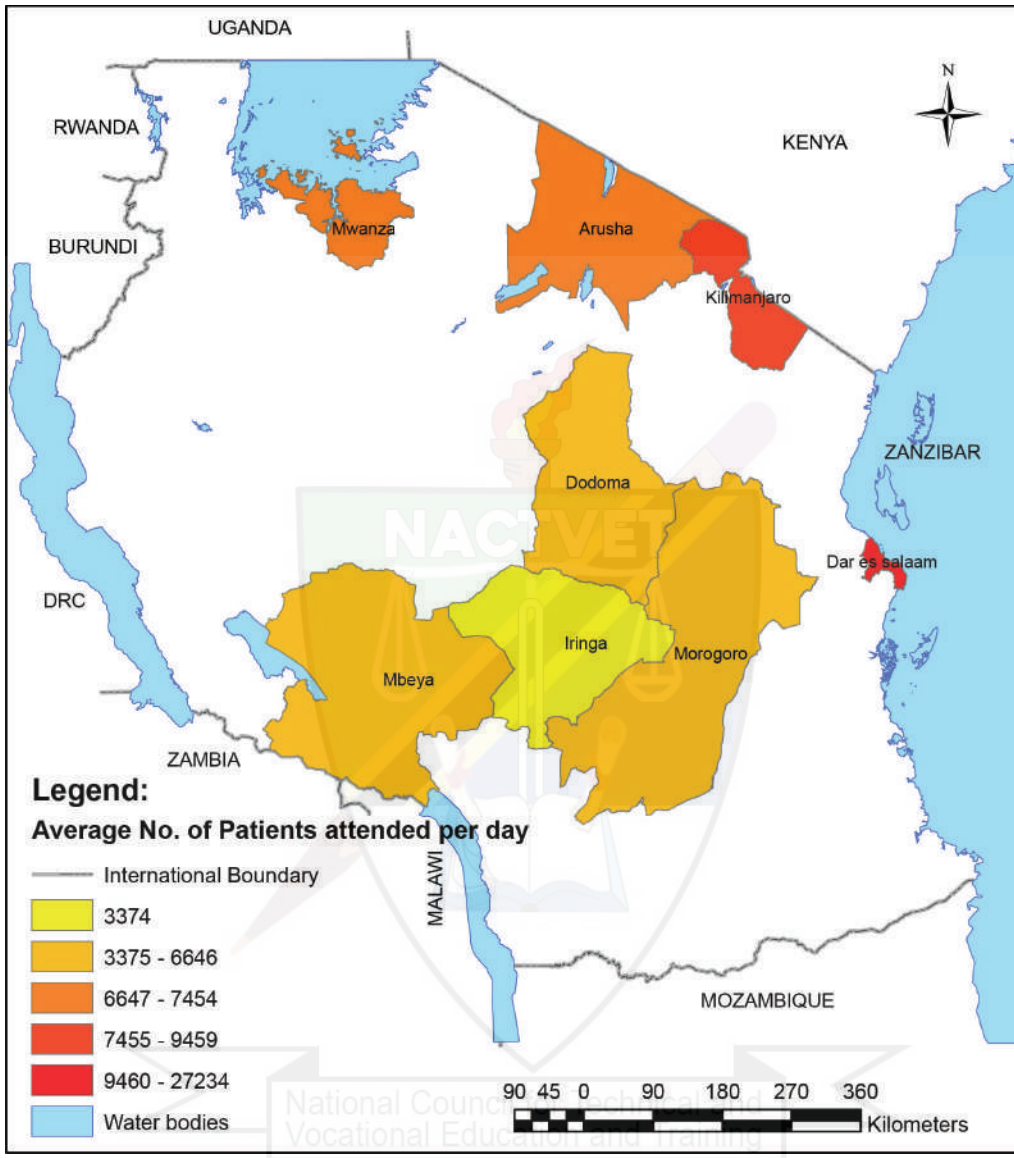


Figure 4: Distribution of Patients attended by Regions

As shown in Table 13, the Iringa region has the fewest (5%) placements available among the studied areas, while Dar es Salaam alone contributes to more than 40% of all available clinical placements. Dar es Salaam, Kilimanjaro and Mwanza constitute more than 60% of available placements, this can be attributed to the fact that these regions are home to

national referral hospitals such as Muhimbili, KCMC and Bugando, which also admit patients from the neighbouring regions (Figure 3), for example, Kilimanjaro Christian Medical Center (KCMC) does not only serve Kilimanjaro region but also Tanga and Arusha regions. Similarly, Bugando Medical Center serves Mwanza, Kagera, Geita, Mara, Simiyu and Shinyanga regions. This implies that these three regions may offer more opportunities for practical training and exposure for healthcare students.

According to guidelines issued by the Tanzania Nurses and Midwifery Council and the Ministry of Health, students should be placed within 15 – 30 km from their healthcare training facility. However, while these conditions may normally be met, with the exception of Arusha, the number of opportunities for clinical placements are fewer than the number of students (degree and non-degree) (Table 13).

In comparison to the other surveyed regions, Arusha has a better balance between healthcare training facilities, and the corresponding number of students. This implies that there could be an opportunity to invest in health training institutes to help fill this current gap. However, in Dar es Salaam, Dodoma and Mwanza there are significant larger numbers of students than available clinical placement opportunities.

Detailed information on placement opportunities for each region is illustrated in Table 13. The overall number of students stands at 45,615 compared to 10,227 available opportunities for clinical placements. The underutilized placements in Dar es Salaam are due to restricted opportunities for students to take up places in military hospitals which do not accept students due to security reasons and some specialized/private consultant hospitals that only accept a limited number of students compared to available clinical placement opportunities, for example, Ocean Road Cancer Institute only accepts 15 students compared to 50 clinical placements available. Similarly, Regional Hospitals such as Mwananyamala and Temeke accept fewer students than apparently available clinical placements due to the high fees they charge for placements.

Table 13: Clinical Placement Capacity

Region	Number Clinical Placements Available	Number Accepted for Clinical Placements	Available Openings	Students' Population
Arusha	857	373	484	355
Dar es Salaam	4,167	2,029	2,138	16,924
Dodoma	831	1,386	-555	8,142
Iringa	547	678	-131	1198
Kilimanjaro	1,183	1,486	-303	4,769
Mbeya	784	1,046	-262	4,163
Morogoro	779	1,008	-229	3,257
Mwanza	1,079	1,769	-690	6,807
Total	**10,227**	**9,779**	**451**	**45,615**

The opportunity to undertake a work placement at a healthcare facility is vital for the sector's future workforce and the need to address these challenges in the demand and supply of places is becoming increasingly important.

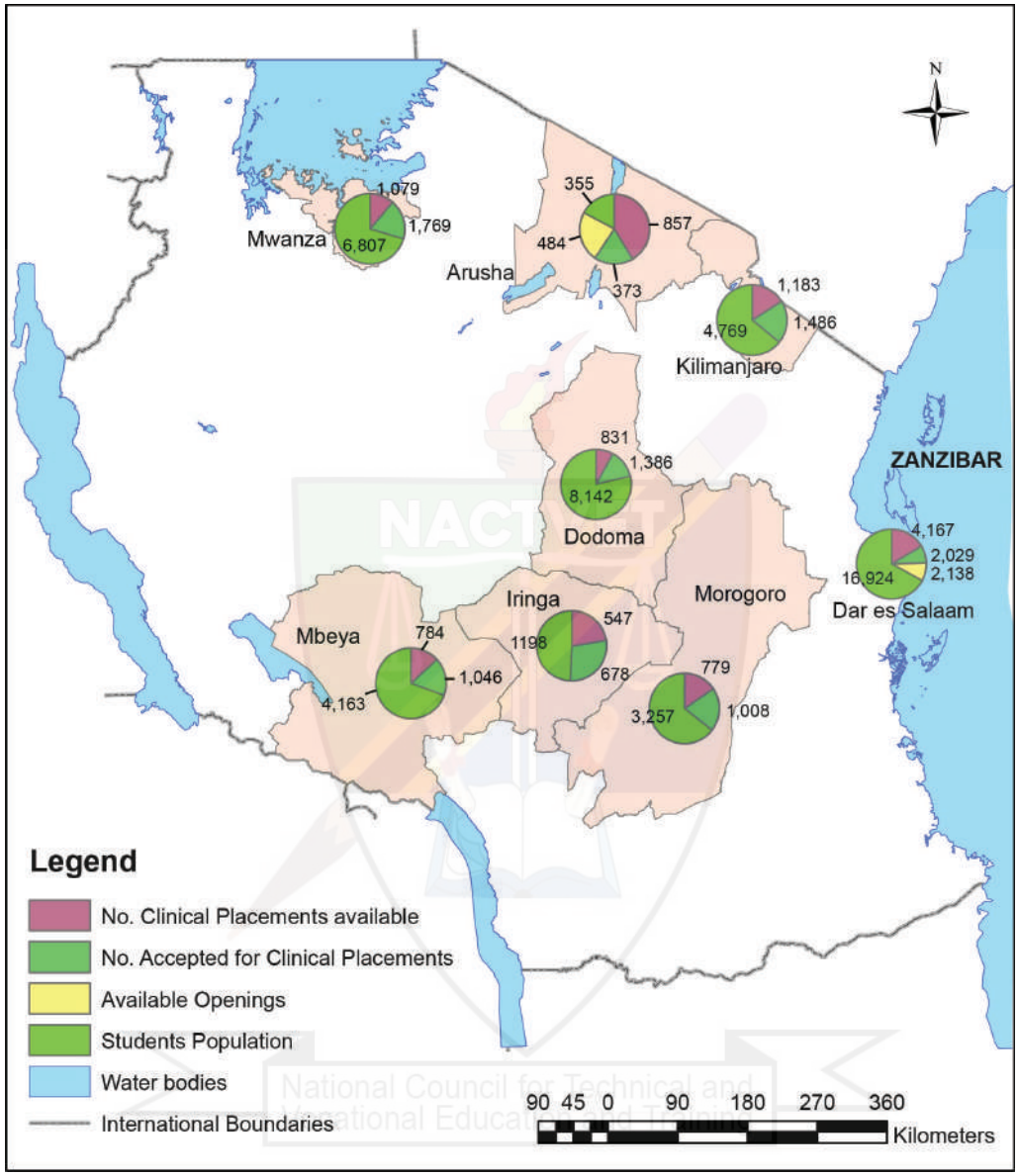


Figure 5: Distribution of Clinical Placements

More than 50% of surveyed facilities were prepared to accept students for practical training across all of the sector's different surveyed types and ownership arrangements. However, it was found that FBO and private-owned health centres were less enthusiastic about accepting

students, with 41% not accepting trainees (Table 14). A willingness to accept students was most prevalent amongst government owned facilities, which demonstrates the critical role government plays in both the provision of health care and the training that supplies the sector.

Table 14: Percentage of Health Facilities Accepting Students

TYPE of Facility	Government (298)		Private (124)		Faith-Based Organization (FBO) (91)	
	Yes	No	Yes	No	Yes	No
Health Center	74%	26%	59%	41%	54%	46%
District Hospital	67%	33%	66%	34%	94%	6%
Regional Referral hospital	85%	15%	77%	23%	100%	0%
Specialized Hospital	100%	0%	71%	29%	100%	0%
National and Referral Hospital	100%	0%			100%	0%

It was further established that some specialized hospitals, predominantly privately owned, do not accept certificate and diploma students. National referral hospitals accept students for healthcare training institutions, although with fewer numbers, thus limiting the capacity of placements. National referral hospitals accepted more degree level students than those of certificate and diploma.

Table 15 : Percentage of Students accepted for Clinical Placements by HF

HF Type	Certificate (%)	Diploma (%)	Degree (%)	Postgraduate (%)
Health Center (339)	58	60	17	3
District Hospital (117)	67	72	28	9
Regional Referral hospital (39)	67	79	49	31
Specialized Hospital (11)	27	64	55	36
National and Referral Hospital (7)	71	100	100	86

The development and growth of qualified health centres and districts hospitals will enhance student placement opportunities by providing a wider geographical spread of qualified healthcare facilities, with closer links to training institutions. This means that if more health facilities are

equipped with enough staff and equipment, placement opportunities at health centres and district hospitals would significantly increase (Table 15).

4.6 Reasons for not accepting Trainees

The problems associated with the shortage of practical training placements are exacerbated by some facilities that do not accept trainees. There is a range of explanations for why these centres choose not to support workplace learning activities, including the lack of effective communication between training institutions and healthcare facilities. It was, for example, observed that about half of facilities that do not take trainees referenced that they had received no requests from training institutions, this appeared to be particularly the case for relatively newer facilities. Some hospitals, primarily owned by the military, only accept students under strict classified conditions, while some consultant hospitals have no provision for receiving trainees. Lack of available staff to attend trainees, especially in health centres, was mentioned as an important barrier to providing placements. Other reasons included; lack of equipment, the remoteness of some facilities in relation to training institutions. These reasons are summarised in Figure 6.

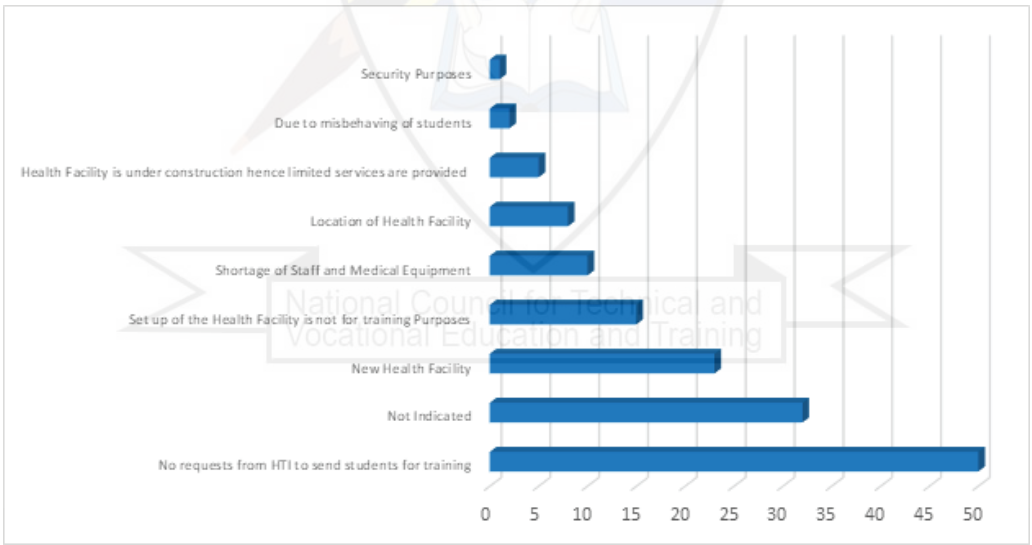


Figure 6. Reasons for not accepting Trainees

4.6.1 Placements in Most Qualified Regional Hospitals

In Figure 7, we ccompare acceptance rates of students to clinical placement/training across the qualified regional hospital subsector. As alluded to before, regional referral hospitals offer good conditions for practical placements. While Dar es Salaam has the most healthcare facilities and, as a result, is expected to provide more opportunities for students' practical training, not all these facilities are best placed to offer work placements, for example, Amana RRH receives the most students and is usually overcrowded compared to its student capacity. On the other hand, Mwananyamala RRH and Temeke RRH receive fewer students than available clinical placements. More widely, Dodoma RRH and Morogoro RRH receive more students than their carrying capacities. These findings call for the need to establish an RHH sub-sector system that will help to identify and better align training opportunities.

Whilst the capacity development of health centers to allow them to train students from Level 5 to Level 6 is important, there should be a mechanisms that will allow diploma students, especially those in Semester II to be trained in RRH in order to provide a broader exposure to different healthcare facilities. As most RRH are qualified and provide diverse training opportunities, it is recommended that regulation that require each trainees, especially at diploma level, to pass through RRH, is introduced.

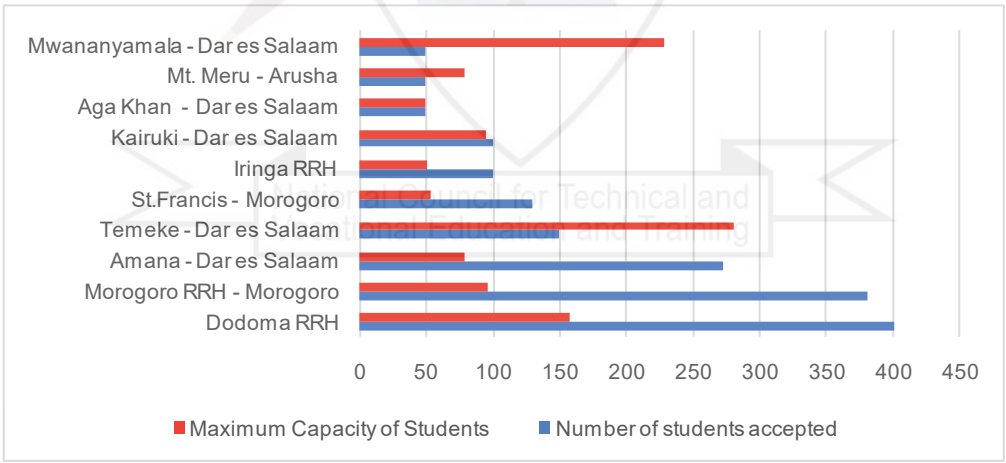


Figure 7: Placements in Most Qualified Regional Hospitals

4.6.2 Student Placements in National and Specialized Hospitals

National hospitals and specialized hospitals offer the best exposure to trainees in terms of types and number of cases at varying levels of complexities. However, on a practical level it is not always easy to access placements in this sub-sector, hospitals are few and often distant from healthcare training institutions. Literature also suggests that, while national and specialized hospitals expose trainees to new and complex cases, they may restrict their, especially diploma students', opportunity to develop an understanding of the standard procedures, that are the mainstay for more than 70% of medical cases treated by ordinary general-purpose healthcare practitioners. Most of these standard procedures are learned in lower level health facilities such as health centres and district hospitals.

As seen in Figure 8, the number of students accepted by Bugando Medical Center, Mirembe, RRH - Mbeya, KCMC is higher than the available placement opportunities. However, Muhimbili National Hospital takes fewer students than expected, resulting in clinical placement opportunities in both campuses (MNH and Mloganzila) being more than the current number of accepted students. This could be because MNH prefers to accept degree, internship and postgraduate students rather than larger cohorts of students following certificate and diploma level courses. Kibong'oto Infectious Diseases Hospital (National Tuberculosis Hospital), which is dedicated to the treatment of tuberculosis, only accepts 40 trainees, primarily specializing in radiography, medical laboratory, clinical medicine, pharmaceutical sciences and health records systems, medical internships and post-graduate study. Ocean Road Cancer Institute, Dar es Salaam, is a specialized hospital for the treatment of cancer patients. The institute receives students at diploma, degree and post-graduate levels. Due to its specialized nature, the hospital receives only 15 students per year.

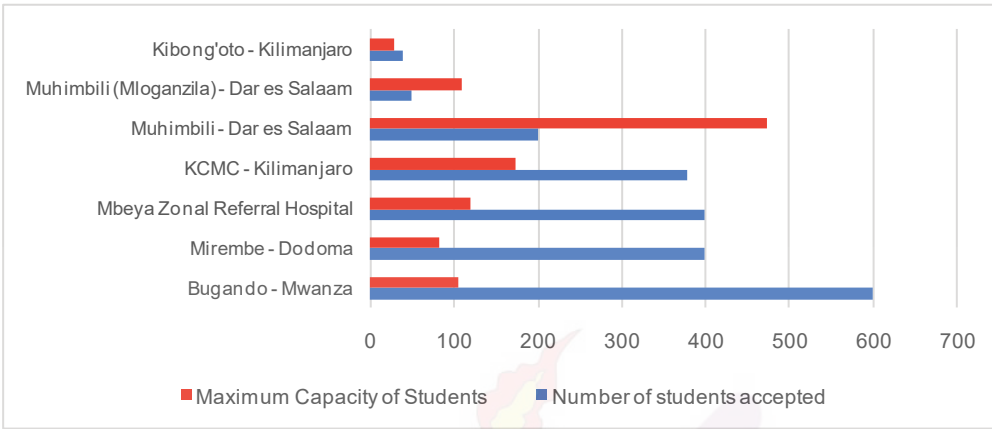


Figure 8: Student Placements in National and Specialized Hospitals

4.6.3 Clinical Placements in Unqualified Health Facilities

As previously identified in this study, some of the surveyed healthcare facilities do not meet with defined sector standards and have been described as 'unqualified'. Nonetheless, some of these unqualified health facilities still accept practical trainees, for example, most health centers do not qualify but are still expected to provide clinical placement opportunities. It was observed that training institutions respond negatively to placing students at unqualified healthcare facilities, as shown in Figure 9. This demonstrates the importance of capacity building efforts to ensure that health centres are improved to provide more opportunities for the quality training of healthcare professionals.

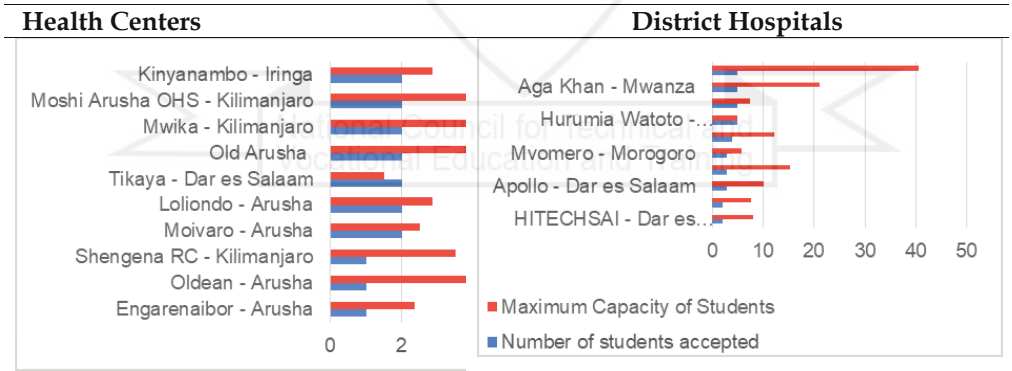


Figure 9: Clinical Placement in Unqualified HC and DH

4.6.4 Types of diseases and Students Placements

As indicated in Fig 10, health centers and districts hospitals commonly handle communicable diseases cases. These include UTI, lower respiratory infections and diarrhea, while most non-communicable diseases, such as diabetes, are mostly handled by regional and referral hospitals. A general observation from the sector is that at lower levels of healthcare facilities, communicable and acute diseases are more observable than non-communicable and chronic diseases.

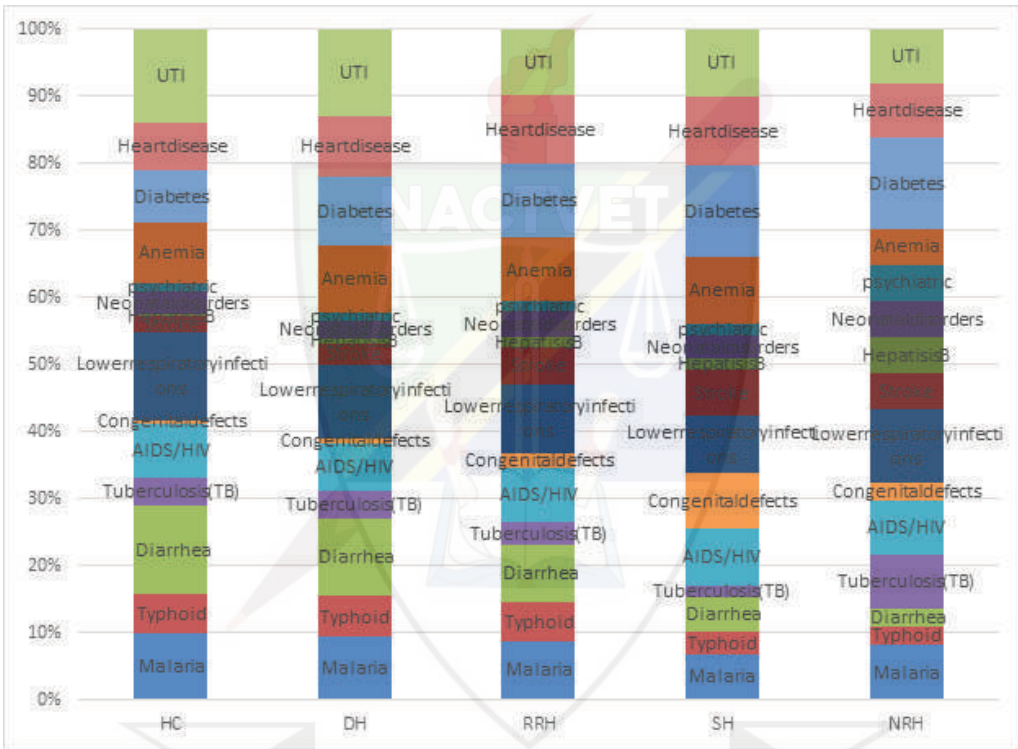


Figure 10: Percentage distribution of Common Outpatient Diseases

Due to the current arrangement where students are placed at healthcare facilities based on the level of their study rather than their specialisation, there is a need to consider the types of skills and knowledge that ought to be acquired during clinical placements at each level of healthcare facility. This means trainees should be placed according to their skills needs i.e. whether they need to train on acute and communicable diseases or

chronic and non-communicable diseases trainees. This type of planning would improve the quality of clinical placements through mapping opportunities to specific training requirements.

4.7 Agreement Signed between Healthcare facilitiess and Health Training Institutions

To ensure that students from training institutes have guaranteed placements, memorandum of understanding (MoU) or legal contracts should be signed between them and healthcare facilities. Typically, training institutions and healthcare facilities develop agreements based on letters requesting placements or establishing a formal agreement. Unfortunately, this study reveals that only 11% of surveyed healthcare facilities signed MoU with training institutions, and with legal contracts, on average, only being used by 2% (Table 16). Weak, poorly defined and informal agreements between training institutions and healthcare facilities pose a risk to the quality of placements and lead to the potential of student overcrowding.

Safety and liability are often cited as reasons why there are limited inpatient clinical placements. Additionally, healthcare facilities that provide acute care sometimes do not want the additional work and liability that students bring, especially as current staff are often already overworked.

To address these types of issues, it is important that relationships between health training institutions and a hospital-based clinical sites are built on some sort of long term legal agreement (recommend that it is valid for three years). The findings from the study also indicate that training institutes must ensure that their learners have a strong understanding of health and safety and liability requirements before they undertake their placements.

Table 16: Percentage distribution of Agreement Signed between HFs and HTIs

Type of HF	Legal Contract (%)	Letter (%)	MoU (%)	No (%)
Health Center	3	87	3	7
District Hospital	1	67	18	14
Regional Referral hospital	3	63	31	3
Specialized Hospital	0	44	22	33
National and Referral Hospital	0	29	57	14
Total	2	78	11	9

4.8 Clinical Placement Cost

The most frequent barriers to accessing work based opportunities are linked to the lack of placements. This is due to both a lack of places and the stiff competition between programs/institutions seeking clinical placements for their student, which is exacerbated by the increasing number of students resulting from the opening of new health training institutions.

These challenges are further exacerbated by the process of securing work placements often being time-intensive, competitive, and expensive. The managing of students' practical training comes at a cost to healthcare facilities which requires them to charge a placement fee. These costs can be seen as a significant additional barrier to the development of sufficient work placement opportunities. Findings indicate that most health centres do not receive compensation for placement while the most Government owned regional referral hospitals receive payments for the same (Table 17a).

Table 17 (a): Health Facilities Accepting Payment for each Student for Clinical Placement

Type of HF	FBO (Faith-Based Organization)		Government		Private	
	Yes	No	Yes	No	Yes	No
Health Center	2%	98%	15%	85%	11%	89%
District Hospital	44%	56%	37%	63%	22%	78%
Regional Referral hospital	0%	100%	77%	23%	23%	77%
Specialized Hospital	0%	100%	33%	67%	14%	86%
National and Referral Hospital	50%	50%	80%	20%		
Grand Total	20%	80%	23%	77%	16%	84%

This study has further established (Table 17b) that specialized hospitals charge the highest placement costs for each student . Specialized government owned hospitals charge, on average, about TZS 50,000 while privately owned charge an average of TZS 300,000. District and regional hospitals both charge an average of TZS 38,000 per student (Table 17b). These findings imply that there is a need to harmonize and standardise the fees charged for students placement in the health-care facilities.

Table 17(b): Clinical Placement Cost

Type of HF	Faith Based Organization (FBO)	Government	Private	Average
Health Center	30,000	39,714	72,857	44,884
District Hospital	42,500	36,176	33,571	38,250
Regional Referral hospital		39,500	35,000	38,000
Specialized Hospital		50,000	300,000	175,000
National and Referral Hospital	40,000	40,000		40,000
Average	**41,667**	**38,955**	**61,000**	

4.9 Spatial distance between Health Training Institutions and Health Facilities

Results presented in Figure 11 show that most training institutions surveyed are within twenty (20) kilometres from healthcare facilities. Those institutes observed to be further than 20km were in Morogoro and a few in Iringa and Dodoma.

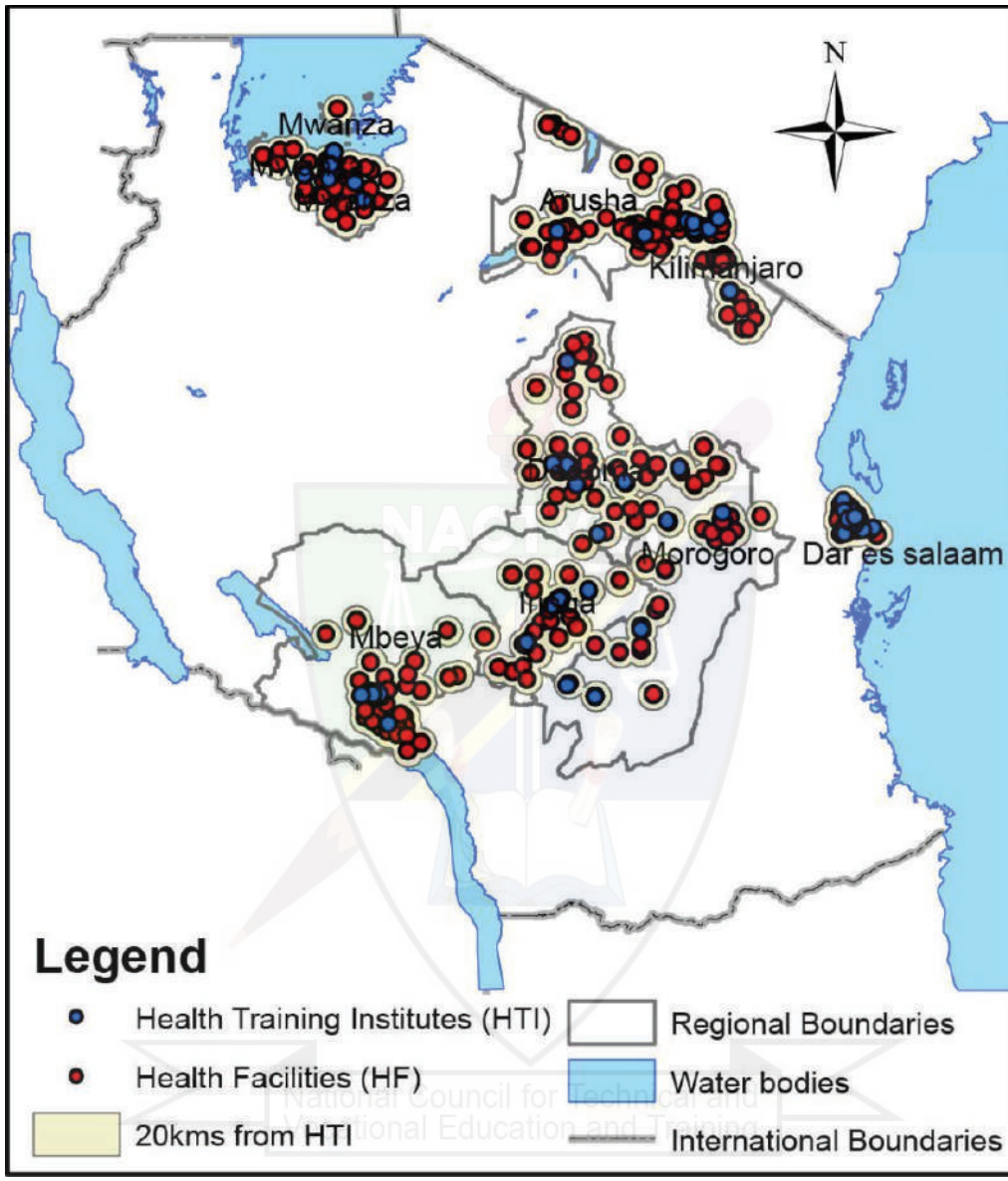


Figure 11: Spatial distance between HTI and HF

While it is helpful to understand the proximity of healthcare facilities to training institutes, the availability of quality placements in these facilities is the true determinant of the access to practical training. For example, while in Dar es Salaam almost all training institutions are within 20kms

from healthcare facilities, student enrollment is higher than the available placement opportunities. This overcrowding can lead to many students traveling significant distances to clinical placements as they to balance heavy study commitments.

4.10 Availability of Clinical Placements for Health-care Students in the Surveyed Regions

The Government has set out an ambitious growth program for the number of students undertaking health professional education programs. To meet this demand, there is a widely acknowledged need to increase the number of available clinical placements. In the subsequent section, we use quantitative placement data to compare the availability of clinical placements to student enrollments (Degree and Non-degree).

4.11 Students Enrollment in the Health and Allied Sciences

As mentioned earlier, we use the student - patient ratio to determine the optimal placement of students in the health facilities. Table 18 presents the expected (apparent) number of students that can be accommodated by healthcare facilities in the surveyed regions, which is also compared with the actual number of students accepted by those facilities. Figures for student enrollments (total population) were obtained through aggregating non-degree and degree data. Enrollment numbers for non-degree courses was established through an online survey to all healthcare training institutions. Whereas, data on degree student enrolments was obtained from the Tanzania Commission for Universities (TCU).

The comparison of current number of student enrollments (total healthcare trainees) to available clinical opportunities in healthcare facilities, show that the student population (45,615) is more than four-times (10,227) the available capacity of healthcare facilities to provide clinical placements in the surveyed regions. This gap suggests a resulting overcrowding of students in the healthcare training sector with the consequent negative impact of skills attainment.

Table 18: Current Enrollment of Degree and Non-Degree

Region	Non-Degree	Degree	Total	Available Placement
Arusha	355	-	355	857
Dar es Salaam	9,464	7460	16,924	4,167
Dodoma	3,350	4792	8142	831
Iringa	1,095	103	1198	547
Kilimanjaro	2,962	1807	4,769	1,183
Mbeya	3,401	762	4163	784
Morogoro	1,114	2143	3257	779
Mwanza	4,049	2758	6807	1,079

4.12 Optimal clinical placements for Health-care Students

This study shows, with the exception of Arusha region, that the surveyed regions have a deficit of practical training placements. Dar es Salaam has only a quarter of the placement opportunities needed compared with the number of students enrolled by training institutions. Other regions such as Dodoma have only 10 per cent placements compared to the number of students enrolled in those specific regions (Figure 12). This gap between the demand and supply of placements implies that there should be the introduction of incentives for investment in new healthcare facilities and training institutes in other regions, along with the capacity building of training institutions in areas with high student populations, including through teaching hospitals on training institutions/college campuses.

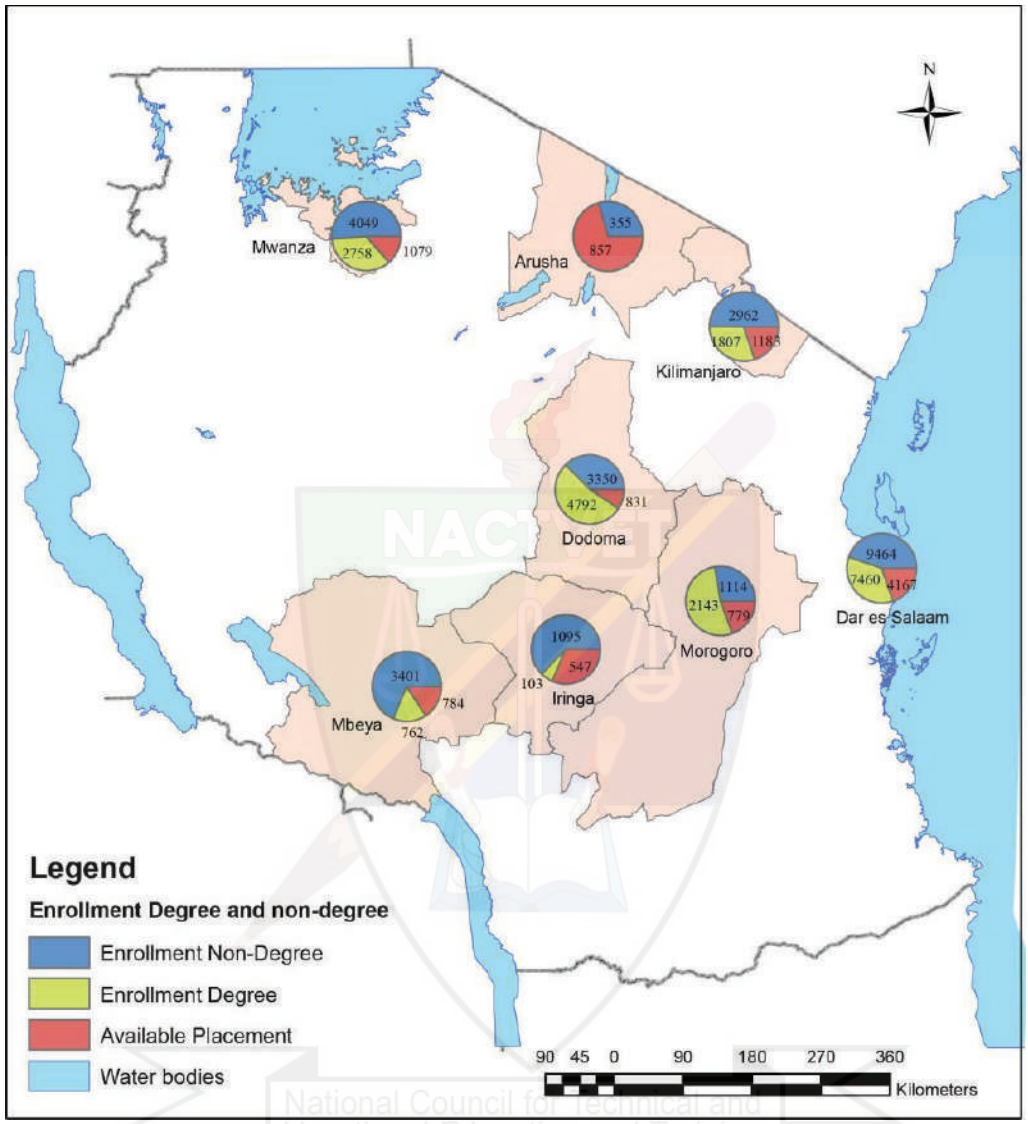


Figure 12: Students Enrollment and Clinical Placements

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions and implications

The Government of Tanzania has successfully invested in developing the nation's healthcare sector, which has resulted in an associated need to train more healthcare professionals. The training of sector technicians brings NACTVET and healthcare facilities together, the former as a regulator of skills development and the latter as a provider of work placements for students.

There is a risk that in areas with higher numbers of healthcare students, than placements, that student overcrowding could limit the quality and effectiveness training delivered through workplace experience. However, the limiting of student admissions will restrict the supply of healthcare professionals, which would adversely impact on the government's capacity building plans for the sector. This critical challenge calls for the mapping of available hospitals and health centres that can support effective training of students.

The study found that more than half of the sector's facilities are government owned, with about a quarter of all healthcare facilities, in the surveyed regions, being in Dar es Salaam and Iringa, whilst, Morogoro and Mbeya had the least number of facilities. Two thirds of surveyed health centres do not qualify against sector standards in terms of available human resources, including the number of doctors. Regardless of the type of institution, five times more patients attend qualified facilities than unqualified. In terms of the health centre, sub sector, qualified centres receive four times more patients per day than unqualified. Most non-qualified health centres have no doctors and clinical officers. The lack of well-trained health workers in healthcare facilities reduces the chances of students interacting with well-trained staff during practical experiences. In the absence of a qualifyied health centre, health training institutions are forced to place students in the district or regional hospital, resulting in the overcrowding of student placements beyond capacity.

Iringa region has the fewest available placements amongst the studied regions, while Dar es Salaam alone contributes to more than 40% of all available clinical placements, with Dar es Salaam, Kilimanjaro and Mwanza constitute more than 60% of placements available in the studied regions. The current availability of placements suggests that Arusha presents a better opportunity for investing in healthcare training institutes than other surveyed regions. Dar es Salaam, Dodoma and Mwanza have the highest number of students in comparison to available clinical placement opportunities. The results show that the student population (45,615) is more than four times (10,230) the available capacity of healthcare facilities to provide clinical placement in the surveyed regions.

The study clearly demonstrates the importance of the Government's role in the provision of healthcare services and training. Government facilities, that constitute most of the provision in the surveyed regions, accepts students for practical training, while half of surveyed FBO and private-owned health centres do not accept trainees. The majority of facilities that do not take trainees indicated that it was due to a lack of proper communication between training institutions and healthcare facilities. The lack of staff to supervise trainees, especially in health centres, was also cited as a barrier for clinical placements.

Arusha region has more placement opportunities than the number of students, whilst Dar es Salaam has only a quarter of the placement opportunities needed compared with the number of students enrolled by training institutions. This gap between students and placements is replicated in other regions, such as Dodoma which only has 10 per cent of placements compared to the number of student enrollments. .

Parking lot: most health training programmes under NACTVET use a curricula developed by MoHCDGEC which synchronizes teaching and assessment across the sector. This results in the healthcare training institutes having relatively similar training calendars to ensure that the required teaching and practical/clinical/field experiences are conducted before examinations (Continuous Assessment Tests and End of Semesters Exams). It is likely that this shared academic calendar could also contribute to overcrowding.

5.2 Recommendations

Based on the above conclusions, this study makes the following recommendations;

(i) Investment in the Health Sector

There is a need for significant reforms and investments in health training institutions and healthcare facilities to establish a closer alignment between the number of trainees and the sector's capacity to host work placements. It is proposed that training institutions in areas with a high population and student supply, can be motivated through tax incentives or public-private partnerships to develop campus-based training hospital. This investment will allow these institutions' learners to access a practical work experience, whilst freeing opportunities in existing healthcare facilities. This report also recommends the importance of institutional level systems that help to identify workplace training opportunities. It is also important that health training institutions ensure that their learners have a strong understanding of health and safety issues before they undertake their placements.

(ii) Improvement of Quality of Existing Health Facilities

Improving the quality of existing healthcare facilities, including those currently defined as unqualified, especially in the health centre sub-sector, will automatically increase clinical placement opportunities. This process will necessitate investment to allow for the deployment of enough staff and equipment in the health centres to build their capacity to supervise quality placements. This investment would have the additional impact of reducing the current stress resulting from the large number of students placed in the district and regional hospitals.

(iv) Registration of Technical Institutions

The registration process of healthcare technical training institutions should consider the availability of healthcare facilities with appropriate student placement opportunities. This would promote the establishment of training institutions in areas/regions with sufficient placement opportunities, such as the Arusha region, whilst reducing the pressure on existing places. This more equitable distribution of placements to learners would promote the quality of the sector's training.

(v) Clinical Placement Guideline

There would be value in introducing placement guidelines, including in the use of legal agreements to guarantee the number of available placements. It is also recommended that training institutes establish agreements with a range of healthcare facilities to allow students the opportunity to access different workplace experiences as required by their specialism.

It is also important that these guidelines are developed to reflect the reforms and improvements being conducted in Tanzania's healthcare system. For example, the guidelines should include some oversight on the type and level of facilities students are placed in.

(vi) Clinical Placement Cost

In order to address challenges of accessing workplace training resulting from placement costs, there is a need to harmonize and standardise fees charged by healthcare facilities.

(vi) Practical training timing should be adjusted across institutions

If the curriculum timetable for practical training is differentiated by levels and types of training, including degree and non-degree, there could be a more optimal utilisation of placements. There is no reason why placements couldn't be more sensibly spread out throughout the academic calendar, this would help to reduce overcrowding and increase the quality of work experience opportunities.

(vii) Building of real-time interactive info database on Clinical Placements

It is recommended that more efficient sector planning could be supported through the development and utilization of a real-time database which provides updates on critical information relating to placements. This will inform decisions regarding the registration of healthcare training institutions, student admissions, institutional planning and mapping of student specialisms.

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APPENDIX I. HEALTH CARE FACILITIES ASSESSMENT QUESTIONNAIRE

About NACTVET

The National Council for Technical and Vocational Education and Training (NACTVET) is mandated by the Act, Cap.129 to register and accredit technical institutions and their training programmes in Tanzania. The Council is therefore mandated to ensure that the quality of education and training required for the awards is met and maintained throughout the duration of the delivery of the course.

What is the survey about?

This survey is about assessment of adequacy of Health Facilities (Hospitals and Health Centers) in supporting training of Health Professionals. Your responses are very important in helping NACTVET regulate and plan for improvement of training of Middle Cadre Health Workers in Tanzania.

1. Name of the health facility …….

2.Location: a. Name of the Ward …….

b. Name of the District…….

c. Name of the Region…….

c. GPS Point……..

3. Type of the health facility (select appropriate the most appropriate) _

a. Dispensary

b. Health Center

c. District Hospital

d. Regional Hospital

d. Referral Hospital

e. Consultant Hospital

4. How many Wards does the hospital/health center have ……... (Number)

5. What type of what Wards does the hospital/health center have? (List)

a…….

b…….

c……

d……

e……

6. What is the average number of patients are registered per day?.....(Number)

7. On average, how many patients are admitted per day…….. (Number)
8. How many functioning beds are in the hospital/health center ……(Number)
9. How many of the following staff does hospital/health center have?
   a. Medical Doctors……(Number)
   b. Nurses……(Number)
   c. Others……(Number)

10. What are the common diseases affecting majority of patients in this area……(List).
11. Do you accept medical trainees/ students?
   a. Yes……if yes, go to question 12
   2. No……. if no, go to question 13
12. Which category of medical trainees/students do you accept (Tick correct responses)
   a. Certificate
   b. Diploma
   c. Degree
13. Under which programme are trainees/students (Tick correct responses)
   a. Laboratory
   b. Dental
   c. Radiology
   d. Clinical
   e. Pharmacy
   f. Environmental Sciences
   g. Nursing and Midwifery
   h. Health Records System
   i. Others (Specify)

14. Give reasons why trainees/are no accepted here……
15. Name the colleges whose students conduct practical training in your hospital/health center? (Please mention) .....
16. Do you have any legal agreement (MoU) with colleges whose students conduct practical training in your hospital/health center?

a. Yes
b. No

17. If yes in (15) above, please mention colleges……

18. How many trainees/students from colleges and universities are accepted at once……(Number)

Thank you for your time

Appendix 2. Health Training Institutions Assessment Questionnaire

About NACTVET

The National Council for Technical and Vocational Education and Training (NACTVET) is mandated by the Act, Cap.129 to register and accredit technical institutions and their training programmes in Tanzania. The Council is therefore mandated to ensure that the quality of education and training required for the awards is met and maintained throughout the duration of the delivery of the course

Information required

NACTVET is soliciting information relating to health facilities availability that support students clinical and practical teaching and learning to improve curriculum delivery and assessment. As your institution/college is a key in this endeavor. Please fill in the questions contains in this form there in accurately. Your responses are very important in helping NACTVET to regulate and plan for improvement of training of Middle Cadre Health Workers in Tanzania.

1. Name of the institution and address:
……
2. District:……
3. Region:……..
4. GPS coordinates (Latitude and longitude):
……
5. What is current Students Enrolment (Total number of students enrolled?) ……
6. What is total number of class rooms?
……
7. What is the Capacity of each Classroom?
……
8. What is the Average Class Size (Number of Students Per Class)?
……...
9. Indicate the Number of Skills Labs…….
10. Please indicate the Capacity of Skills Laboratories:
……
11. Number of Medical Labs: ……
12. What is the Capacity of Medical Labs:.....?

13. Number of Compounding Labs:
…….....
14. What is the capacity of compounding laboratories:
……?