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Distribution of primary health care facilities in Mtwara District, Tanzania: availability and accessibility of services

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Abstract
Background: Access to health care services is a significant factor to health seeking practices that contributes to a healthy population. Improving health care accessibility is an important health priority in low-income countries. The objective of this study was to determine distribution of health care facilities and identify the high priority areas, which require more services in Mtwara, southern Tanzania.
Methods: This study was carried in Mtwara Rural district of southern Tanzania and involved health care facilities. A hand held global positioning system was used to geo-reference the coordinates of all facilities. A questionnaire with both closed and open-ended questions was used to gather information from patients who attended the respective facilities. Interviews with district health officials and facility in-charges were conducted.
Results: There were 38 health in the district. Most of them were located within southern part of the district. The majority of facilities (97%) were government owned. On average each facility was serving 2,400 population. Malaria management, reproductive and child health services, family planning and integrated management of childhood illnesses were offered by all health facilities in the district. Prevention of mother to child transmission of HIV was offered by 34 (89.5%) facilities. Tuberculosis services were offered by only 3 facilities while voluntary counselling and testing of HIV and anti-retroviral treatment services were available in 15 and 10 health facilities, respectively. Only 4 facilities had laboratory and inpatients services. The majority of the staff included Medical Attendants (39%), Nurse Midwives (34%), and Clinical Officers (20%). Assistant Medical Officers and Nursing Officers each accounted for 2% of the total staff. There were no Medical Officers, laboratory technicians or pharmaceutical technicians in the district. A total of 408 health facility clients (≥18yrs) were interviewed. Factors influencing the choice of a health facility were the availability of special services, medicine and qualified human resources.
Conclusion: The majority of facilities in Mtwara are government and there is disparity in the distribution of the facilities. Availability of medicines and qualified human resources were the major factors on the preference for accessing health care services.

Keywords: health care facility, service, access, availability, Tanzania

Introduction

Access to adequate healthcare remains a challenge for about 1.3 billion people worldwide and to the majority of people in developing countries. The degree of accessibility of health care facilities is one of the most significant indicators for measuring the efficiency of a health care system in any country (Kara & Egresi, 2013). Many factors affect a population's ability to access appropriate levels of health care. According to both (Penchansky & Thomas, 1981) and (Oliver & Mossialos, 2004), these factors are grouped into three categories: availability, acceptability and affordability. The factors depend on a multitude of supply- and demand-side factors (Healy et al 2004). Supply-side factors are related to availability which include the distribution of facilities, waiting times, unfavourable services, and human resources and capital (Bower *et al.*, 2003; Turnock, 2009). The demand-side result from predisposing, enabling, and needs factors including socio-demographics, past experiences with healthcare, perceptions regarding health and illness, income levels and scope, and extent of health insurance coverage (Allin *et al.*, 2009). The supply

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and demand sides can be assessed along by availability of the existing healthcare services that meet clients' needs; affordability looks if the prices of services fit the clients' income and ability to pay; accessibility of the location of the services is in line with the location of clients; accommodation of the organization of healthcare services meets the clients' expectations and acceptability of the characteristics of providers match with those of the clients.

Geographical accessibility is frequently stated as spatial or physical availability of composite relationship among spatial separation of the population and allocation of health care facilities (Black *et. al*., 2004). While it is known that distance to health care services affects situation/condition of public health population adversely, there remains inadequate quantitative information concerning this effect (Guagliardo, 2004). Major barriers to access health services include long distance to a health facility, shortage of transport and nonexistence of functioning referral system (Kahabuka *et al.*, 2011; Hanson *et al.*, 2017). In Tanzania, most of the population is expected to live within 5 km from a health facility. However, there are still geographical inequalities in access to health services. The remoteness of these facilities also makes medicine and medical supplies distribution and referral of patients difficult. Accessibility to health care is concerned with the ability of a population to obtain a specified set of health care services, with the concept of "specific" having the potential to vary depending on the policy focus or impact of disease (Oliver & Mossialos, 2004).

Despite the assurance of the government of Tanzania to improve health and wellbeing of the population, equitable provision of health care services is still a challenge. Health service consumers have the need to identify or be referred to the most suitable, as well as nearest health service. Studies have shown a regular decline in accessibility to health facilities with increasing distance to health care facilities (Al-Taiar *et al*. 2010). Adeyemo (2005) noted that there is a limit to the distance, which people are ready to travel in order to use health services. The author further stated that attendance at a health facility is a function of both type of services available at the facility and the distance to other medical facilities providing similar service.

One of the key goals for health care facility planning is to attain the unbiased geographical allocation of health care resources. By having an equitable distribution of health care resources two key areas for facility planning need to be accomplished. These are cost containment by decreasing oversupply and equity of access by increasing supply to underserved areas (Yang et al. 2006). In addition, unbiased geographical distribution of health care supplies is a component of social integrity in health sector. However, there has been a great concern about the affordability of care as well as a disrepair of spatial accessibility of health care facilities (Guagliardo, 2004). Analysing the relationship between location of health facility and services can assist in controlling and minimizing diseases. It can be used for better planning with more effective healthcare facility utilization. This study was carried out to determine the geographical distribution of primary health facility and factors affecting accessibility to healthcare services in Mtwara District in southern Tanzania.

Materials and Methods

Study area

This study was carried out in Mtwara rural district in southern Tanzania. The district is located between 10°16'0" South and 40°11'0" East. The district has a total population of 204,770. The district has single rainy season that starts from November/December to April/May with a peak in January. Temperatures fluctuate from 27° in December to 23°C in July. The relative humidity is high, ranging from 87% in March to 79% in October. Mtwara is predominately agricultural like most districts of Tanzania. The main engagement (92%) of the populations is crop farming – major crops been cassava, sorghum, millet and cashewnut (URT, 1997). The district is served by 38 health facilities (4 health centres and 34 dispensaries). It has no district hospital but the Ligula Regional Hospital serves as the first referral level.

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Study design and data collection

All public and private health facilities in the district were considered in the study. The catchment area and population coverage capacity of each facility was identified through the secondary data on district reports. A hand held global positioning system (GPS) was used to geo-reference the geographical locations of 38 health facilities, and coordinates of all health facilities were collected. Secondary data were collected from various documents including facility processing files, District Health Management Information Systems and district evaluations and supervision reports.

At least 10 clients were interviewed per facility during their visit time. A questionnaire with both closed and open ended questions was used to determine client's preference on choice of healthcare facility, to gather information about means that patients use to access the facility, time used to reach the facility and the general view on their satisfaction of health services obtained. In depth interviews were administered to district health officials including the District Medical Officer (DMO), District Health Secretary (DHS), Health Management Information System focal person, District Nursing Officer (DNO), Health Facility supervision officer and Head of transport and logistics. An interview guide was used to collect information on health services offered to the entire district and provision of supportive supervision to the health facilities. Health facility in-charges were interviewed for the purpose of establishing details of each facility, service offered, human resources capacity, catchment area and population served.

Data analysis

Collected data including geo-coordinates of all health facilities, HF type, ownership and ward, human resource, type of services offered and population served were entered on the created database, in which tables were designed using MySQL database. A geodatabase was generated using ArcCatalog (ArcInfo) and used for generation of point maps.

Ethical Consideration

This study received ethical approval from the University of Dar es Salaam. Permission to conduct the study at health facilities was sought from Mtwara District authorities. During the course of data collection, consented respondents were assured of the confidentiality of the information collected.

Results

Geographical distribution of health facilities

The distribution by ownership shows that majority of facilities (97%) are government owned. The results of this study have shown a random distribution of healthcare facilities although it is not uniform throughout the district. Most of the health facilities were located in the southern part of the district. There was no single health facility in the western part of the district (Figure 1).

Accessibility of healthcare facilities and services

It was found that malaria management, reproductive and child health (RCH) services, family planning and integrated management of childhood illnesses (IMCI) were offered by all health facilities in the district. Prevention of mother to child transmission of HIV was offered by 34 (89.5%) facilities. Tuberculosis services were offered by only 3 facilities, Voluntary Counselling and Testing of HIV and Anti-retroviral Treatment by 15 and 10 health facilities, respectively Only 4 facilities (health centres) had laboratory and inpatients services (Table 1).

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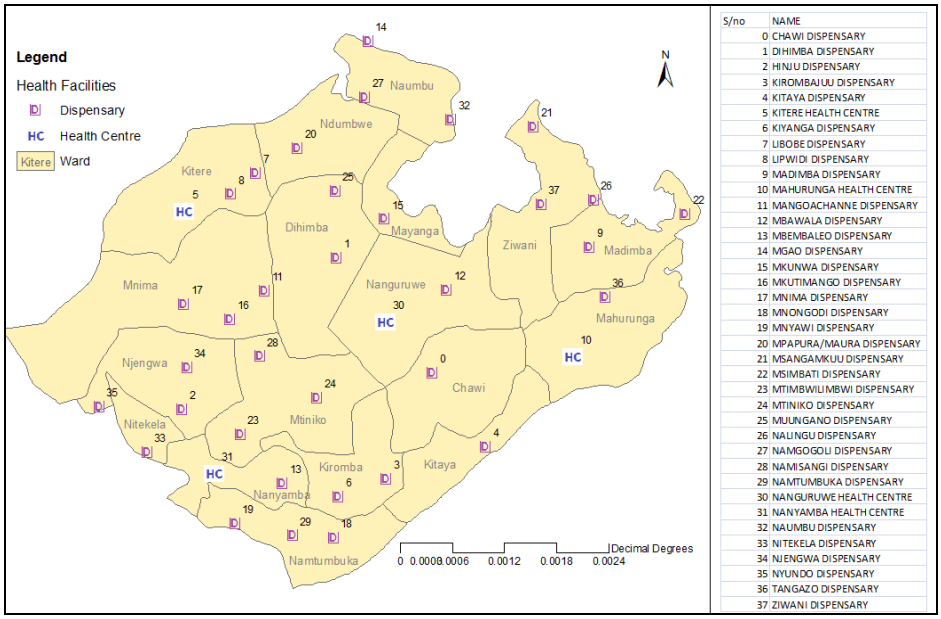

S/no	NAME
0	CHAWI DISPENSARY
1	DIHIMBA DISPENSARY
2	HINJU DISPENSARY
3	KIROMBAJUU DISPENSARY
4	KITAYA DISPENSARY
5	KITERE HEALTH CENTRE
6	KIYANGA DISPENSARY
7	LIBOBE DISPENSARY
8	LIPWIDI DISPENSARY
9	MADIMBA DISPENSARY
10	MAHURUNGA HEALTH CENTRE
11	MANGOACHANNE DISPENSARY
12	MBAWALA DISPENSARY
13	MBEMBALEO DISPENSARY
14	MGAO DISPENSARY
15	MKUNWA DISPENSARY
16	MKUTIMANGO DISPENSARY
17	MNIMA DISPENSARY
18	MNONGODI DISPENSARY
19	MNYAWI DISPENSARY
20	MPAPURA/MAURA DISPENSARY
21	MSANGAMKUU DISPENSARY
22	MSIMBATI DISPENSARY
23	MTIMBWILIMBWI DISPENSARY
24	MTINIKO DISPENSARY
25	MUUNGANO DISPENSARY
26	NALINGU DISPENSARY
27	NAMGOGOLI DISPENSARY
28	NAMISANGI DISPENSARY
29	NAMTUMBUKA DISPENSARY
30	NANGURUWE HEALTH CENTRE
31	NANYAMBA HEALTH CENTRE
32	NAUMBU DISPENSARY
33	NITEKELA DISPENSARY
34	NJENGWA DISPENSARY
35	NYUNDO DISPENSARY
36	TANGAZO DISPENSARY
37	ZIWANI DISPENSARY

Figure 1: Map Showing the Distribution of Healthcare Facilities in Mtwara Rural District

Villages and population served by each facility was determined and found that the 38 health facilities were serving a total of 114 villages with a total population of 274,420. This translate to one facility serving three villages and a population of 7,222 people. These findings indicate that the majority of Mtwara rural population can access a health facility within short distances, assuming all other factors are considered.

Table 1: Service Offered by Health Facilities

Service type	No. health facilities	Percentage
Inpatient	4	10.5
Malaria	38	100
Reproductive and Child Health	38	100
Family planning	38	100
Integrated Management of Childhood Illnesses	38	100
Tuberculosis	3	7.9
Laboratory	4	10.5
Anti-retroviral therapy	10	26.3
Prevention of Mother to Child Transmission	34	89.5
Voluntary Counselling and Testing	15	39.5

Human resource

There was a total of 231 health workers in the health facilities in the district. The majority were Medical Attendants, followed by Laboratory assistants (Table 2). None of the facility had either a Medical Officer, Pharmacist/Pharmaceutical technician or laboratory technician.

Community preference of healthcare facility

A total of 408 individuals (≥18yrs) seeking health care were interviewed. Of these, 320 (78.4%) were females and 88 (21.6%) males. Factors mentioned to influence the choice of a health facility were the availability of special services, medicine and qualified human resources. For instance, availability of ART services, made clients to travelling long distances in search of the service. The respondents were aware of the health facilities with regular tendencies of stock-out of medicines. The "stock-out" phenomenon of essential drugs and supplies was the main factor that discouraged seeking of services from such facilities.

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Table 2: Human resource distribution by type of facility

Cadre	Dispensary		Health Centre	
	No of staff	%	No. of staff	%
Assistant Medical Officer	0	0	3	2.34
Clinical Officer	26	25.24	3	2.34
Assistant Clinical Officer	0	0	0	0
Nursing Officer	0	0	3	2.34
Nurse midwife	35	33.98	14	10.94
Medical Attendant	42	40.78	49	38.28
Laboratory Assistant	0	0	56	43.75
Laboratory technician/Technologist	0	0	0	0
Pharmaceutical Technician	0	0	0	0
Total staff	103	25.24	128	
Average number of staff per facility	4		10	

Human resource shortage and under-skills were also factors that community considered in selecting a health facility. Moreover, staff-client interactions caused a preference of certain staff hence the choice of health facility. In this study shortage of human resources was observed as one of the factors that affected the overall availability and accessibility of health service and contributed to the long waiting and service times

Discussion

The results of this study have shown a random distribution of healthcare facilities although it was not uniform throughout the district. The health care facilities in Mtwara District agglomerate in the southern part of the district. Such unequal distribution of health facilities in developing countries has been reported from a number of studies (Alabi, 2011; Kibon & Ahmed, 2013). Like in our study, a study in Turkey has also reported that most health facilities were located in one part of the Büyükçekmece district, where the population was relatively denser (Kara & Egresi, 2013). Although in our study we could not be establish the reasons for most facilities to be concentrated in the southern part of the district, elsewhere in the world the most important factors that influence the distribution of health facilities include population income and education level (Senturk *et al*., 2011).

It has been described that low-income countries suffer from lack of or insufficient healthcare infrastructure which tend to be concentrated in the cities and major towns while vast rural areas remain uncovered by health services (Kara & Egresi, 2013). In Tanzania, the geographical accessibility of the primary health facilities is reported to be at about 90% of people living within five kilometres. However, there is great variation among districts. Besides, land terrain, poor infrastructure and lack of reliable transport poses serious challenges to expecting mothers and very sick patients to access health services when they need them (MoHSW, 2007a). These findings indicate that the majority of Mtwara rural population can access a health facility within short distances, assuming all other factors are considered.

Like in Mtwara, the majority of the health facility in other districts in Tanzania are government owned. In Tanzania, 69% of all facilities are government-owned while only 8% are owned by civil society organizations, 6% are parastatal organizations and 17% are privately owned (NIMR, 2011). The fewer private health facilities in Mtwara is likely to be associated with the level of economic status of the population. Mtwara is among the poorest regions in Tanzania. The findings of this study indicate that the majority of Mtwara rural population can access a health facility with an average of 2,400 population per village. Generally in Tanzania, without considering a type of health facility, an average of 1.5 health facilities serves a population of 10,000 people (MoHSW, 2007b; NIMR, 2011; Mboera *et al.,* 2015). However, the density ranged

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from less than one per 10,000 in Sengerema and Kigoma Urban districts to 3.1 per 10,000 in Kibaha district (Mboera et al., 2015).

Like elsewhere in Tanzania, the majority of the health facilities in Mtwara Rural District offer malaria management, reproductive and child health services, family planning and integrated management of childhood illnesses and HIV/AIDS services. Recent national data indicate that about half (54%) of all health facilities in Tanzania offer HIV testing and counselling services (HTC). In a national survey, among health facilities proving antenatal care services, 39% were offering Prevention of Mother to Child Transmission (PMTCT) with antiretroviral (ARV) prophylaxis services (NIMR, 2011). The number of health facilities offering PMTCT in Mtwara was higher than the national average. PMTCT services are critically important in the prevention of spread of HIV. National statistics indicate that the majority of facilities offering HIV care and treatment are in Dar es Salaam (13.8%) followed by Iringa (7.2%), Arusha (7.1%), Kilimanjaro and Mwanza (6.7%) and are few in Kigoma, Singida, Mtwara and Manyara (Somi *et al*., 2009). Similarly, findings of this study indicate that in Mtwara district, HIV Counselling and Testing and Anti-retroviral Treatment were offered by 39.5% and 26.3%, respectively. This is quite a comparatively low coverage.

Similar to our findings, the availability of medicine including ART and skilled human resource were among the main reasons for a choice of a facility. Other studies of health facilities services in rural area of Tanzania have shown that people are willing to travel long distances to reach facilities perceived to provide services of better quality (Hanson *et al*., 2017). This is a major equity issue indicating that quality health care is less accessible to the economically disadvantaged population who cannot afford travelling costs to access quality care at higher level hospital (Kahabuka *et al.*, 2011). Elsewhere, access barriers to health care have included distance to health facilities, low quality of services, cost of access, lack of information, and socio-cultural norms (Ensor & Cooper, 2004; Osubor *et al*., 2006; Kiguli *et al.*, 2009; Parkhurst & Ssengooba, 2009). On the contrary, in South Africa, routine availability of medicine was shown to be the best strategy for improving public sector health services. It was shown that communities were prepared to tolerate poor quality public sector service characteristics such as a long waiting time, poor staff attitudes and the lack of direct access to doctors if they were guaranteed that they will receive the medicines they need (Honda *et al.*, 2015).

Human resource for health was inadequate in almost all health facilities in Mtwara. Situation of health workers was found to be worse among clinicians, nurses, pharmaceutical technicians and laboratory technicians. Inadequacy of qualified health providers is common in Tanzania. Overall, in Tanzania, there are 7.2 core health professionals per 10,000 populations, including 0.4 physicians, 1.7 non-physician clinicians (assistant medical officers and clinical officers), 1.1 registered nurses, and 3.9 registered midwives (Mboera *et al.*, 2015). Despite the low human resource capacity in the district, on average Mtwara region has recently been described to have a relatively better health intervention coverage, higher than expected on the basis of their health system strength (Kumalija *et al*., 2015).

In conclusion, the distribution by ownership shows that majority of facilities in Mtwara are government an there is disparity in the distribution of the facilities. There was no health facility in the western part of the district, hence the uneven accessibility of health services. Availability of medicines and qualified human resources were among the major factors on the preference for accessing health care services.

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