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Access and Challenges of Health Facilities amongst Agro-pastoralist Communities in Handeni District, Tanzania

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Abstract

This study examines high incidence of under-five mortality among agro-pastoralists resulting from lack of access to healthcare facilities. A proportional sampling method was adopted, and descriptive statistics and binary logistic regression were used in data analysis. The results revealed low dependence of agro-pastoralists on formal healthcare facilities, which could be explained by prevalence of informal healthcare facilities in villages where they reside. Education, income, accessibility, and duration of stay in a particular area accounted for the choice of healthcare facilities. Level of education and income determined preference for formal health facilities, possibly due to influence of education on understanding benefits of treatment in formal health facilities and income to meet associated costs. Accessibility of health facility influenced the decision to patronize formal health facilities. This was evident in villages which were connected to reliable road networks. Additionally, the length of time one resides in a particular area played a role in adhering to traditional values influencing the choice of informal healthcare facilities. The government and private sector should invest in rural road networks and promote education among agro-pastoralists on importance of using formal healthcare facilities and rational use of household income to improve accessibility to formal health facilities.

Keywords

Health; agro-pastoralists; formal health facilities; informal health facilities; traditional healers

Introduction and Background

Agro-pastoral farming system is a practice of agriculture that includes both the growing of crops and rearing of livestock (Tsegaye et al., 2013). Both activities need large acreage, which creates pressure on other land uses (Rufino et al., 2013). According to Boureima and Flury (2016), vast land in sub-Saharan Africa has been used for agro-pastoral activities even for areas which were initially earmarked for other uses, such as settlements and reserves. Interactions between agro-pastoral and non agro-pastoral activities have resulted in social problems such as land use conflict and poor access to formal health facilities (FHFs) and services.

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Studies have found that agro-pastoralist communities in remote areas have difficulty accessing FHFs resulting in the communities patronizing informal health facilities (IHFs) (Duba et al., 2001; Caulfield et al., 2016). However, Cheikhyoussef et al. (2011) argue that traditional knowledge of plant species as medicines and traditional views on causes of diseases compel agro-pastoralists to rely more on traditional treatments. However, this has resulted in severe health issues such as diarrhoea which need FHFs intervention (Shidhaye et al., 2015). Therefore, identifying causes of health problems and related treatment at FHFs is important among agro-pastoral communities. Further, it is also important for women who are usually responsible for caring of under-five children and older persons within agro-pastoralists households, to attend treatment at FHFs (Charlton & Rose, 2001).

Health services play an important role in promoting population's health and livelihoods of communities. According to Montenegro et al. (2011), health services results in improved community health status and its members regardless of age, gender, location and occupational background. Access and utilization of health services ensure healthy society and results in minimal health problems such as reduced incidences of under-five mortality and resources which could otherwise be used for productive activities (Enwerem et al., 2014). In a situation where residents have challenges accessing health services, they are likely to seek traditional healers or traditional birth attendants or delay presenting themselves to appropriate health facilities. However, Minstry et al. (2016) point out that delays in seeking FHFs result in late diagnosis, and delayed treatment, delivery support and vaccination services. It has to be noted that laboratory test available in FHFs are basic for diagnosing health problems and recommending appropriate treatment (English et al., 2009). Moreover, inadequate formal health services and treatments can result in people suffering from common and preventable diseases (American Diabetes Association, 2015).

The nature of agro-pastoralists' activities requires them to live in remote locations where there is adequate land for farming, and grazing. Unfortunately, these locations are far away from the nearest FHFs. Thus, households opt for informal health facilities, including traditional birth attendants during delivery. It is reported that traditional healers and traditional birth attendants are not trained in western medicine and as a consequence, leading to the death of the pregnant mother and her baby (Kayombo, 2013; Minstry et al., 2016). Patients who sought treatment from IHFs before resorting to FHFs experience more health complications (Dawood et al., 2017). The under-five children from agro-pastoralist households are mostly affected by this practice (Atwine et al., 2015).

According to the National Bureau of Statistics (NBS, 2015), Handeni District has a high rate (84.8%) of under-five mortality compared with 60.8% and 41.5% recorded in Muheza and Rombo Districts, respectively. The high rate of under-five mortality recorded in Handeni District might be explained by the health seeking behavior of agro-pastoralists, which are specific to their norms and cultural values. The values, practices and nomadic lifestyle of agro-pastoralists, among other reasons, make it difficult for them to access and use FHFs in a timely manner. In addition, the available options of health facilities, accessibility and delivery of health services may compound the problem. It is in this context that this paper examined options of health facilities, access and challenges of formal health service delivery in the study area, Handeni District, Tanga Region in Northeast Tanzania. The following are the research questions answered by this paper: 1) What options of health facilities exist in the study area? 2) What factors account for the choice of a certain health facilities among agro-pastoralists? And 3) what are the challenges affecting access to FHFs and implication of health service delivery among agro-pastoralists?

Study Area and Research Context

The study was conducted in Handeni District, Tanga Region located in North-Eastern part of Tanzania. According to Tanzania's 2012 Population and Housing Census, Handeni covers 355 702 km^2 and has a total population of 276,646 (URT, 2012). The major economic activities in the district include livestock farming, hunting and gathering, fishing, forestry resource and subsistence farming (Tanga City Council Report, 2012). The district experiences coastal climate with high temperatures (27°C to 30°C) and high humidity, while the mean annual precipitation is 800 mm. to 1500 mm. Agro-pastoralists in the study area were previously traditional full time pastoralists, but they have slowly begun to live a sedentary life (Bee, Diyamett & Towo, 2002). Also, due to climate change, agro-pastoralists in Handeni District have adopted seasonal migration (nomadic) which sometimes leads them to live in more remote areas (Botterli, 2015). They are also characterized by traditional values and practices of which power is centered in the hierarchy of age set and division of labor which all together have an influence on household decisions.

Available health options in a particular community are among determinants of access to health facilities. According to Muiya and Kamau (2013), health services are categorized as formal and informal health facilities (FHFs and IHFs). The FHFs are those which are certified and registered by regulatory authorities while the IHFs are not. The Handeni District has formal public and private hospitals which are located in the district headquarters and IHFs are dominant in the rural areas. According to Boex et al. (2015), the government had taken initiatives to ensure availability of health facilities such as village dispensaries, clinics, pharmacies and antenatal care in rural areas. Lemire (2016) pointed out that, while government's efforts could ease the people's access to the FHFs, the majority of agro-pastoralists seek the services of traditional birth attendants. This situation threatens survival of expectant mothers and their babies. The preference for IHFs despite the effort of the government to promote FHFs, may explain the high mortality rate recorded in Handeni District. This raises an empirical question:

1) What types of health facilities exist in the study area? Are the available formal health facilities accessible to agro-pastoralist communities?

Studies have also reported that indigenous knowledge about biodiversity of medicinal plants, cost, friendly staff and perceived experience of birth attendants and education are determinants of the choice of IHFs (Ibrahim & Ibrahim, 1998; Shehu et al., 2016). Although these factors could be true, these studies were carried out in communities other than agro-pastoralists whose lifestyles may deny community members access to health services, not because they have indigenous knowledge on certain plant species but probably because of inaccessibility to FHFs. Given that Tanzanian agro-pastoralists are considered vulnerable communities (United Nation Children and Education Fund [UNICEF], 2016), this paper answers the following research question:

2) What factors account for the choice of a certain health facility among agro-pastoralists?

Understanding these factors will help policy makers to come up with appropriate interventions to increase the choice of health facilities among agro-pastoralists and improve their health.

Under-five children lack adequate protection due to agro-pastoralists' nomadic life style. Living in remote areas limits access to FHFs since such areas are located away from formal healthcare services (Mrisho et al., 2009). Male household heads are more mobile than females who take care of their children, with inadequate resources to access FHFs. Treatment and cost of medicines at FHFs as well as lack of certain medicines at formal health facilities are cited as common challenges which often affect under-five children (Acacio et al., 2015).

Poor access to health services is considered to be among factors responsible for high under-five mortality among agro-pastoralist communities. Therefore, the study intends to answer the following question:

3) What are the challenges affecting access to FHFs and implication of health service delivery among agro-pastoralist?

Understanding challenges affecting access to FHFs and the complication related to service delivery will improve timely service delivery and the health of the vulnerable agro-pastoralists.

Theoretical background

Different theoretical models explain access to health facilities. These include health services models, interaction model of client health behavior, health belief model, equity of access model, among others. In this paper, a slightly modified Kohn and White health services model is used to describe the theoretical framework for a multi-variety analysis.

The model was developed by Kohn and White in 1976 (Simon, 2007) to understand macro level of health services systems. According to this model, health care process is determined by a number of attributes. Although factors such as the structure and supply of services, as well as guidelines underlining a given health system are different, they regulate individuals using the services. Figure 1 shows two sets of factors, agro-pastoralists' life styles and their psychobiological system, that determine both morbidity and access to health facilities. Collectively, they involve things such as education, income, cultural values, behavior and mental phenomena. Factors influencing health services use may not affect all the people at the same time and level, leading to difference in attendances to health facilities. Health access is influenced by location, cost element, cultural values and trust given to traditional healers (Chauhan et al., 2015). Factors influencing health services sometimes challenge attainment of health services by driving people to explore different health options. Factors influencing use of health facilities are not uniform; hence, sometimes people use formal, informal or combine both formal and IHFs. The paper considers a combination of different health care systems and its impacts particularly on the health of under five children.

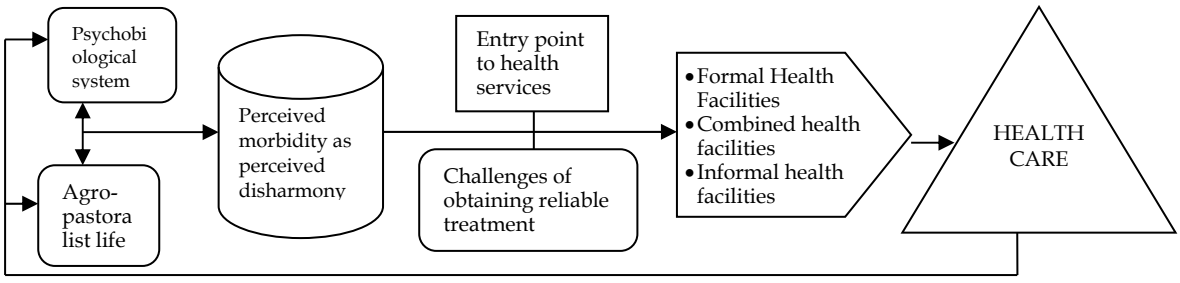

Figure 1: Source: Modified Kohn & White in 1976's Health Services Model

Methodology

The study uses a cross-sectional research design whereby data was collected at a single point in time. This design has been recommended by several scholars for example; Babbie (1990); Bailey; (1998); Bryman (2004) and Delice (2010) due to its cost and time effectiveness in data collection. Handeni District was considered as the study area due to the observed high (84.8%) rate of the under-five mortality, but also being among the districts in Tanzania with high number of agro-pastoralists (URT, 2015: Mwamfupe, 2015). Furthermore, purposive sampling technique was used in selection of wards and villages involved in the study. A sample of 160 households was selected for the study and was obtained through proportionate stratified sampling. Through this technique, four villages, Kibaya, Msomera, Malezi and Kilimilang'ombe with 1,024, 1,000, 713, and 400 households, respectively were sampled. A proportion for each village was calculated by dividing the total number of village households to the overall total households for all the villages. The selected sample was considered relevant since all the villages had the same interest, values and traditional practices. Also, the sample size was considered adequate since scholars (Bailey, 1994; Gray, 2014) argue that a sample of 30 or more cases is suitable for studies in which statistical data analysis can be done.

Data was collected using a structured questionnaire. In order to test validity of the questionnaire, it was pre-tested in Bangu Village in Handeni District by interviewing 20 households. A review of the questionnaire was done whereby some questions were added while ambiguous statements were omitted. Later, the amended version of the questionnaire was used for the actual data collection.

For the first and third research questions, data was analyzed using descriptive statistics whereby frequencies and percentages were computed. The focus was to identify health facilities available in the study area, challenges affecting access to FHFs and implications of health services delivery to agro-pastoralists.

A binary logistic regression model was used to address the second research question on factors influencing choice of health facilities in the study area. The model used is shown in the equation below:

$$\text{Log}\,[Pi / (1\text{-}Pi)] = \beta o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots + \beta_9 X_9 + \varepsilon$$

Where;

Log [Pi / (1-Pi)] = Natural logarithm of the odds for choice of health facilities. The dummy for the dependent variable (choice of health facilities in the study area) was coded as 1 = formal health facilities, 0 = informal health facilities.

Pi = the probability that formal health facility would be chosen

βo = Constant

ε = error term

β_1 to β_9 = Logistic regression coefficients of the predictor variables. Independent variables in the model are as follows:

X_1= accessibility (1= Permanent roads, 0 = seasonal roads)

X_2 = sex (1 = male, 0 = female)

X_3= age (in years)

X_4 = education (1= formal education, 0 = informal education)

X_5 = household number of children (ratio)

X_6 = years lived in the area (ratio)

X_7 = use of household resources to meet treatment costs (Yes =1, No = 0)

X_8 = Marital status (1 = married, 0 = not in union)

X_9 = household annual income (ratio)

Results

Demographic Characteristics

Demographic characteristics such as age, sex, education, marital status, are considered important variables in research since selection of services like health facilities can vary with respect to these variables (Konya, 2016). A majority of the respondents in this study were in the 30-44 age group (55%), followed by those in the 18-29 age group (28.1%). The individuals in these age categories were considered mature enough to be involved in common agro-pastoral activities. The majority of the respondents were females (61.2%) (Table 1). This was because most males were either out grazing their livestock or farming.

Table 1: Demographic characteristics of respondents (n =160)

Demographic Attributes	Number	Percent (%)
Age of household head (years)		
18-29	45	28.1
30-44	88	55.0
45-54	22	13.8
55+	5	3.1
Sex		
Male	62	38.8
Female	98	61.2
Marital status		
Married	130	81.2
Not in union	30	18.8
Education of household head		
Formal education level	91	56.9
Informal education level	69	43.1
Household size (number of persons per household)		
2-8	125	78.1
9-15	32	20.0
16-22	2	1.3
23-29	1	0.6
Household number of Children		
1-5	101	63.1
6-10	56	35.0
11-15	2	1.3
16-17	1	0.6

Source: Field survey, 2014

Those who had formal education accounted for 56.9% (Table 1). The numbers of children in the households were categorized into four age groups (1-5, 6-10, 11-15 and 16-17 (Table 1). The average number of children per household was six (6). This was slightly higher compared with the national average of 5.4 (URT, 2010). Worth noting here is that, the majority (63.1%) of the households had children aged between 1 and 5. Therefore, it implies that more attention is required in the study area since this age group is classified as a vulnerable group (URT, 2015) as health problems are inevitable.

Table 2: Respondents' level of education by sex (n=160)

Level of education	Male		Female	
	Number	Percent	Number	Percent
Formal education	38	69.1	53	50.5
Informal education	17	30.9	52	49.5

Source: Field survey 2014

Table 2 shows that 69.1% and 50.5% of male and female respondents had formal education respectively. Further, the results show that 49.5% and 30.9% of male and female respondents had informal education, respectively.

Available Options of Health Facilities

The study examined the available options of health facilities in order to establish whether health service delivery was adequate before providing recommendations. The results are presented in Figure 2 with options of health facilities categorized into formal and informal. The FHFs included village dispensaries (12%), clinics (12%), antenatal care (8%) and pharmacy (14%). On the other hand, IHF included Traditional Birth Attendants (29%) and Traditional healers (25.0%), who were dominant in the rural area across the study area. Despite the dominance of IHF in the rural areas, respondents pointed out that occasionally they sought medical treatment at district and private hospitals located at the district headquarters.

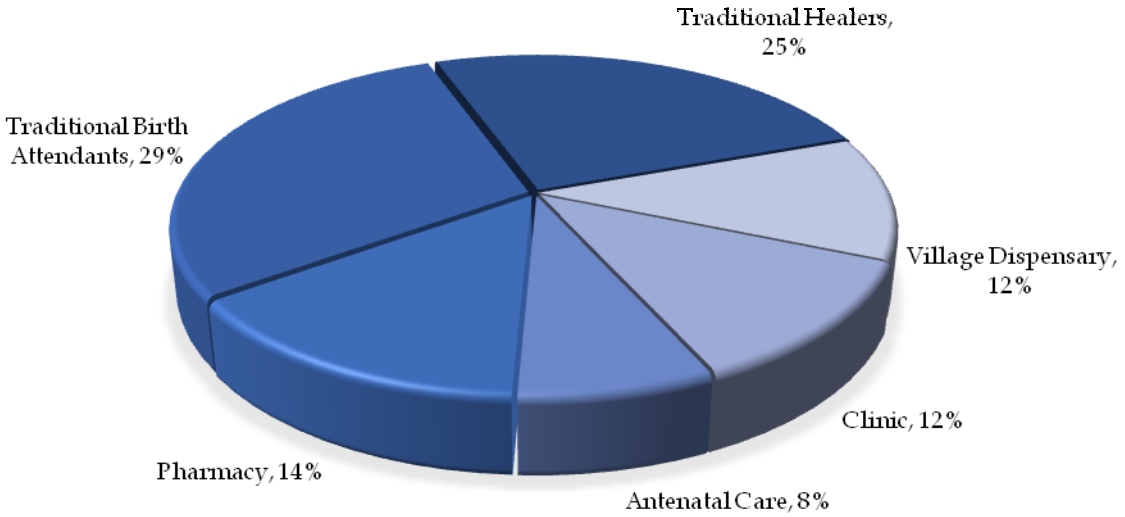

Figure 2: Available options of health facilities in the study area (n = 591)

Utilized Health Facilities in the Study Area

There are variations among villagers in accessing healthcare facilities. For instance, in Msomera village where there is a dispensary and clinic, only 23.12% and 21.87% of the respondents attended those facilities respectively, while 28.1% of all respondents in Kibaya village with no formal health facilities sought the help of traditional healers. Interestingly, the findings show that all respondents (100%) from the study areas visited traditional birth attendants (Table 3).

Table 3: Health facilities and services used in the study area (n=160)

		Formal Health Facilities					Informal health Facilities	
Ward	**Village**	**Village dispensary**	**Clinic**	**Antenatal Care**	**Pharmacy**	**District &private Hospital**	**TBAs**	**Traditional healers**
Misima	Kibaya	20(12.50)	9(5.63)	9(5.63)	30(18.75)	11(6.87)	52(32.50)	45(28.12)
	Msomera	37(23.12)*	35(21.87)*	10(6.25)	30(18.75)	7(4.37)	51(31.90)	42(26.25)
Chanika	Malezi	14(8.75)	13(8.13)	18(11.25)*	36(22.5)*	5(3.12)	36(22.50)	33(20.62)
	Kilng'ombe	9(5.63)	8(5.00)	5(3.12)	9(5.63)	1(0.63)	21(13.10)	19(11.88)
Total		**80(50.0)**	**65(40.63)**	**42(26.25)**	**105(65.63)**	**24(15.00)**	**160(100.0)**	**139(86.85)**

Source: Field survey 2014
*Key: * FHFs available in the study area. IHFs were all available*
Number of attendance are shown outside the bracket
Percent (%) of attendance to health services are shown inside the bracket

Choice of Formal Health Facilities

The choice of health facilities was examined in this study in order to establish the tendency of agro-pastoralists to use formal or informal health facilities and implication on their health. Binary logistic regression model was used to estimate the probability of a binary response based on several independent variables. Table 4 shows the results of binary logistic regression which was used to examine the choice of FHFs or IHFs (formal = 1; while informal = 0). The Omnibus Test of the model coefficient gives an overall indication of how well the model performs. It is referred to as goodness of fit test (Pallant, 2007). A highly significant value $p \leq 0.05$ is needed and in this case, the value was $p \leq 0.05$. The chi-square value reported in this study was 33.686 with 9 degrees of freedom. For the Hosmer Lemeshow Goodness of fit test, poor fit is indicated by a significant value $p \leq 0.05$, so to support the model, a *p*-value greater than 0.05 is needed. In this study, the chi-square value for the Hosmer Lemeshow test was 5.634 with a *p*-value of 0.688. This value is larger than 0.05 which supports the model. The Nagelkerke R Square value indicates the amount of variation in the dependent variable explained by the model ranging from 0 to 1. The two values are 0.190 and 0.275, suggesting that between 19.0% and 27.5% of variability in the outcome variable is explained by a set of predictors. Binary logistic regression results indicated that some of independent variables had influence on the choice of FHFs or IHFs.

The findings in Table 4 show that permanent road, level of education, years living in the study area and household annual income had significant influence on the choice of formal health facilities and services.

Table 4: Logistic Regression Predicting Likelihood of Choosing Formal Health Facilities (n=160)

Variables entered in the model	**ß**	**S. E**	**Wald**	**p-value**	**Odds ratio**
Accessibility					
Permanent road	0.487	0.245	3.941	0.047	1.627
Seasonal Road[(a)]					
Sex					
Male	0.307	0.476	0.417	0.518	1.359
Female [(a)]					
Education					
Formal education	0.154	0.059	6.843	0.009	1.166
Informal education [(a)]					
Age (Cont)	0.009	0.028	0.090	0.764	1.009

Household number of children (Cont)	-0.010	0.085	0.140	0.906	0.004
Years lived in the study area (Cont)	-0.509	0.192	7.00	0.008	0.182
Use of HH resources for treatment					
Yes	0.006	0.199	0.001	0.975	1.006
No[(a)]					
Marital status					
Married	-0.015	0.187	2.013	0.531	0.087
Not in union[(a)]					
Annual income (Cont)	0.005	0.000	5.388	0.020	1.005
Constant	3.285	1.247	6.936	0.008	26.698

Note: (a) = Reference category

Based on the results of the logistic regression in Table 4, the findings showed that permanent roads were the strongest predictor among agro pastoralists to choose FHFs, recording an odds ratio of 1.627, ß=0.487, $p<0.05$. This indicates that those residing close to permanent roads were over 1.6 times more likely to choose formal health facilities than those who did not have access to permanent roads, controlling for all other factors in the model. The variable permanent road suggests reliability of road from rural to district town where formal health facilities are mainly located. This means households in areas with permanent roads location have increased access and thus more likely to attend FHFs. Given the fact that the study was carried out in rural areas with relatively poor road infrastructures, this is one of the reasons that may explain why the majority of agro pastoralist did not seek treatment at FHFs, which are mostly located in the district town. The results further indicate that education had a significant influence on the choice of health facility with an odd ratio of 1.166, ß=0.154 at $p< 0.05$. The findings imply that household heads with formal education are 1.2 times more likely to use FHFs than those with no formal education.

Table 4 shows the odd ration of 0.182, β= -0.509 at $p<0.05$ for years the agro-pastoralists lived in an area which was less than 1, indicating that for every additional year of living in an area, the agro pastoralists were 0.182 times less likely to report seeking the services of FHFs. Income had a positive relationship and significant influence on the choice of health services (β=0.005) at $p<0.05$ (Table 4). The odds ratio of 1.005 suggests that an annual income increase of 1 Tanzania shilling in the agro pastoralist households increases the likelihood of attending FHFs by 1.005 times.

Challenges of Accessing FHFs

Table 5: Distance in kilometers (km) to health services within and outside the study area

Villages / Health services	Distance (Km)			
	Kibaya	**Msomera**	**Malezi**	**Kilimilang'ombe**
District & Private hospital	16.3	40.0	17.1	20.1
Village dispensary	1.4	1.4	1.4	1.1
Pharmacy	0.5	0.6	0.4	0.3
Clinic	1.2	0.8	1.6	1.2
Antenatal care	0.5	0.6	0.2	0.2
Traditional Birth Attendants	1.9	1.7	0.5	2.0
Traditional healers	0.5	0.4	0.3	0.4

Source: Field survey 2014

Uses of basic services amongst others health services are not free of challenges, the most important being cost and distance to FHFs. Table 5 shows the distance to these health facilities are 16.3 km, 40.0 km, 17.1 km and 20.1 km from Kibaya, Msomera, Malezi and

Kilimilang'ombe villages, respectively. Distance from villages to FHFs at the District headquarters hinders residents in the study area to access FHFs. Other factors include high costs whereby more than a half (59%) of the respondents did not access formal services because they could not afford the cost of treatment. The majority (70.6%) of the respondents reported shortage of medicines at formal health facilities as a barrier.

Table 6: Issues challenging access to FHFs (n = 160)

Factors influencing choice of formal services	Disagree		Undecided		Agree	
	Number	%	Number	%	Number	%
Unaffordable costs	95	40.0	1	0.6	64	59.4
Medicines are not available at FHFs	36	22.5	11	6.9	113	70.6
Laboratory services reliability	114	71.2	9	5.6	37	23.1
Mobility life style hinders access to available FHFs	33	20.6	24	15.0	103	64.4
Health care personnel are corrupt	25	15.6	29	18.1	103	66.2
It consumes a lot of time to visit the nearest health facility	17	10.6	16	10.0	127	79.4

Source: Field survey 2014, FHFs = Formal health facilities

Factors such as state of mobility which features among agro-pastoralists' life style was pointed out by 64.4% of the respondents (Table 6) as a challenge affecting access to FHFs, and that it was pushing agro-pastoralists away from established FHFs. Corruption was mentioned by 66.2% of the respondents among factors affecting access to FHFs. Apparently, this impedes poor rural dwellers' access to FHFs.

Table 7: Roads condition

Village	Permanent		Seasonal	
	Number	%	Number	%
Kibaya	37	52.9	15	16.7
Msomera	10	14.3	41	45.6
Malezi	20	28.6	16	17.8
Kilimilang'ombe	3	4.3	18	20.0
Total	**70**	**100.0**	**90**	**100.0**

Source: Field survey 2014

The condition of village roads was determined whether an individual could have year-long access to FHFs at the District headquarters. Table 7 shows 52.9% of residents from Kibaya village were permanently connected to the district headquarters by the main road throughout the year, while 45.6% of the respondents from Msomera village experienced poor connectivity.

Discussion

The purpose of this study was to examine options of healthcare facilities, access and challenges of formal health service delivery among agro-pastoralist communities. It was found IHFs were available in the villages of the study area while FHFs were located in the district headquarters. The findings indicate FHFs were not readily accessible to the agro-pastoralist communities. For instance, only 8.75% of the respondents from Malezi village sought the services of the village dispensary as opposed to 20.62% from the same village who patronized the traditional healer (Table 3). Additionally, more than 90% of respondents use IHFs, particularly traditional birth attendants during child delivery. The intensive use of

traditional treatment increases the vulnerability of the under-five children. This supports Downie's (2012) observation that delivery by traditional birth attendants is the biggest contributor to causes of under-five mortality cases.

This study identified the following factors that determined the choice of health facilities: indigenous culture and practices of a particular place, respondents' education level and income. For indigenous culture and practices of a particular place, it was found that people dwelling in a particular area for a long period of time tended to seek traditional treatments, influenced by knowledge and cultural values attached to the health services in an area and ignore formal health services. These practices can have consequences on the health of rural population. However, further studies on influence of cultural dimensions are essential in exploring cultural values in relation to the use of health facilities.

The study also found, low level of education affect both male and female access to FHFs. According to Acharya et al. (2010), education is crucial in influencing decisions related to choice of health facilities and services as well as mobilization and management of household resources to fight against diseases. As shown in Table 2, nearly half of the respondents (49.5%) had no formal education. It should be borne in mind that education is essential in making decision; without education, people can decide wrongly and later suffer the consequences of poor decision. For example, Yaya et al. (2017) concluded that participants with formal education were about twice as much likely to seek FHFs compared with those without. Thus, it is clear that more than half of residents in the study area had poor awareness and understanding of relevance of seeking health services from FHFs. The study suggests investing in education in the study area may influence agro-pastoralist communities to attend to FHFs for treatment hence reducing their health problems.

In addition, it was shown that treatments at the FHFs at the district headquarters had placed some financial pressure on the households (Tables 5 & 6) such as travelling expenses, as well as treatment, accommodation and meal costs. These costs were incurred mainly by expecting mothers and their assistants because expecting mothers may not necessarily give birth on the same day of their admission. Thus, livestock owned by these agro-pastoralist households can be sold to meet treatment costs. The current study emphasizes on awareness creation among agro-pastoralists so that they can see rationality of using household resources in order to overcome barriers such as travelling and treatment costs.

The study also found that dependency on traditional knowledge is risky since some diseases may need specialized diagnosis which could lead to appropriate treatment. This is consistent with Christina et al. (2013) observation that, in some cases, inappropriate treatment was associated with poor diagnosis and interpretation of diseases which led to health complications. Eshete et al. (2016) noted that traditional treatments were accompanied by a cultural based interpretation of the causes of diseases.

Logistics and distance to formal health facility was another issue. There was an average distance of 23.2 km to the nearest FHFs (Table 5). According to Kadobera et al. (2012) population living more than 1 km from healthcare services experienced 17% increased mortality risk. Long distance, coupled with the nature of roads from rural areas to the location of FHFs, contributed to persistent health problems among agro-pastoralists in the study area. Long distance and unreliable road network to formal health facilities caused delay and hence late treatment. In such a situation, expecting mothers and other patients, particularly under five children, suffer and sometimes it leads to loss of life which basically could have been prevented if they had approached the nearest FHFs. Therefore, establishment of FHFs and ensuring service availability within the study area could facilitate

access to reliable services and treatment. The study emphasized those children from households living more than 5 km away from formal health facility were at greater risk given that rural roads were not passable during certain times of the year.

In addition, seasonality of the village roads posed challenges to access FHFs at the district headquarters. For example, Table 3 shows that only 4.37% of the respondents from Msomera village were accessing FHFs at district headquarters. This is because of poor village road conditions during certain times of the year. Thus, village roads need improvement as to facilitate access to the FHFs which may contribute to reducing health problems in the study area, specifically for under five children.

Generally, the findings imply that improved access to health services, greater investment in education, quality of formal services and minimizing corruption and bureaucracy in formal health system will motivate residents in the study area to patronize FHFs. Furthermore, accessibility of formal health facilities will have desirable health effects on agro-pastoralists. Mobility which is seen as a challenge to access FHFs should be handled by establishing FHFs within the study area.

Conclusion and Recommendations

This study found that IHFs were available across the villages in the study area while FHFs were concentrated at the district headquarters. Additionally, the IHFs were preferred by the agro-pastoralists for logistical and traditional reasons. The study recommends conducting awareness creation campaigns in the study area on the relevance of using FHFs that can help in reducing health problems among agro-pastoralists.

In addition, level of education and income were the key factors accounting for the choice of FHFs. Therefore, strengthening awareness and empowering women in decision making and allowing them to use household resources in fighting diseases can help the communities access FHFs, hence reducing their health problems. Accessibility to the area was a variable influencing choice of FHFs. Agro-pastoralists living in villages adjacent to the main road heading to the district headquarters were found to access FHFs more than those who reside in villages located in interior part of the study area. Therefore, the study recommends that the government and Non-Governmental Organizations should collaborate and establish FHFs within the study area. Also, it is recommended that traditional birth attendants should be guided to assist accompanying expectant mothers to FHFs rather than encouraging them to help the mothers deliver at their places. Necessary efforts should be taken to ensure all villages are connected to the main road with reliable feeder roads. This will help access and attainment of basic services offered at FHFs.

Further, the study found that extended stay in an area is likely to tune people to indigenous cultural values, practices and knowledge, which motivate them to rely on IHFs as an alternative to FHFs. Thus, there is a need to harmonize cultural values, practices and uses of FHFs. Dangers associated of not having or missing vaccinations due to the communities' preference for traditional medication need to be examined and addressed. The study recommends future works to look at the role of culture on household power dynamics and uses of FHFs or IHFs among the agro-pastoralist communities.

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