

# Public Knowledge, Perceptions and Practices in Relation to Infectious and other Communicable Diseases in Tanzania: Lessons Learnt from Babati District

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## Abstract

**Background:** We report public knowledge, perceptions and practices on selected infectious diseases in Tanzania using a study done in Babati district, and identify policy related messages in light of health promotion strategies instituted for communicable disease control. **Methods:** Data were gathered through semi-structured interviews with individual household members and focus group discussions with other residents in several villages; in-depth interviews with health workers, local government leaders, and district health managers. **Results:** Many villagers associated malaria transmission with people's exposure to intense sunrays; TB and brucellosis with people drinking raw-milk, animal blood and meat; sharing a bed or utensils with TB/brucellosis patients; TB with smoking or inhaling cigarette smoke; leprosy with witchcraft; and lymphatic filariasis and schistosomiasis with people contacting dirty-water or through sexual intercourse. Occasional shortage of drugs and laboratory services, lack of reliable transport facilities, low public use of latrines, unaffordable bednet prices, and common sale of counterfeit drugs by unregulated retailers were perceived to perpetuate the existence and widespread communicable diseases. Use of traditional medicines to treat these diseases was reported to be a common practice. **Conclusion:** Culturally rooted knowledge and beliefs about diseases influence people's health care seeking practices and may perpetuate prevalence and transmission of diseases. There should be educational policy program considerations among the strategies aimed at effective disease control.

**Key words:** Communicable diseases; psycho-social, health care-seeking behaviour; Tanzania

## Introduction

Globally, communicable diseases including those of infectious nature remain a health systems challenge in many low income countries despite dramatic progress made so far at global level to reduce their prevalence and contribution to loss of life. [1] However, variations exist in the prevalence and distribution of such diseases measured in terms of their morbidity and mortality impacts between and even within countries. Many records continue showing that sub-Saharan Africa (SSA) has the greatest burden of infectious diseases and childhood illnesses. [2] Infectious diseases alone do account for at least 69% of deaths in Africa. [3] Looking at the burden of each selected disease separately, particularly those the present paper pays attention to, records show that Human African Trypanosomiasis (HAT) accounts for about 60 million people who are at risk, and this disease is restricted in tropical Africa. [4] Schistosomiasis is estimated to affect millions of people whereby about 207 million are infected with schistosomes, and among these 90% live in SSA. [5] Lymphatic filariasis (LF) is a threat to 1.3 billion people worldwide and of the over 120 million people who are already infected, the majority live in SSA. [6] Meanwhile, records indicate that 120 million people in 37 countries are at

risk of Onchocerciasis, and among the 37 million individuals currently infected, 99% live in Africa. [7]

Human brucellosis is a global problem as well since it is distributed all over the world in both developed and developing nations. [8] Meanwhile, the United Nations evaluations show that globally an average 35.3 million people were living with HIV in 2012, SSA being the region most affected, followed closely by and south-eastern Asia. [9] Among the factors continuing to be widely documented regarding the prevalence of the identified diseases is low public awareness/knowledge of the nature and methods for effective control of such diseases [6], and this together with the chronic weakness of most African health systems, policies and a generally low national investments in healthcare training and service delivery, make the control of such diseases difficult. [3] Knowledge or awareness about particular diseases among those mentioned may vary from one individual or community to another. Sometimes, the degree of awareness/knowledge about disease depends on the extent to which people have experienced such diseases, or are exposed to the campaigns available against such diseases. [10]

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Evidence shows that people's perceptions about disease risks such as transmission and health consequences do influence their attitudes and health seeking actions/behaviours towards the diseases concerned. [11] Thus, assessing the knowledge of the individuals or members of the general public about diseases and their control methods would help the interventionists or analysts see how far the observed knowledge corresponds to biomedical concepts. The typical questions in the assessment process may include one's knowledge about the causes and symptoms of the illness under study. [10]

Diseases like human brucellosis that prevails in areas where animal grazing is dominant may not be widely known of their existence, symptoms, modes of transmission, control. [12] Despite their serious health and socio-economic consequences, less known diseases may also not even be prioritized by researchers [8], and one of the neglected diseases in majority of developing countries is the human brucellosis. This disease is caused by bacteria, and usually manifests itself as an acute febrile illness which may persist and progress to a chronically incapacitating disease with severe complications. [12] More concerted measures for a significant reduction if not elimination of infectious and other communicable diseases continue being suggested. [13] As a leading global health department, the World Health Organization (WHO) has set a target of ending some of the seemingly neglected tropical diseases by the year 2020, and apart from malaria, other diseases targeted include HAT, schistosomiasis, LF and Onchocerciasis. [6]

Experts have suggested that the burden of disease in general is a function of factors in the social realm and this means there is need to look at the social dimensions of health and disease while planning for particular disease focused interventions. While this fact remains, it is sad that it is commonly ignored in practice [14], and as a result most of the disease focused interventions established tend to be sub-optimally utilized. [15-16] In Africa, as in other developing countries, it is common for the people living in particular community settings to associate specific diseases with mystical factors or natural factors, and this contributes to late treatment seeking behaviour which at times end up with undesired negative health outcomes. [17] Thus, understanding the social perceptions of health and disease within the cultural context is one of good ideas because people's beliefs and perceptions do shape their behaviours and ability to adopt or cope with the existing health interventions. [18-19]

Today around the world, the issue of individual and public beliefs, perceptions and general knowledge of disease continues being recognized to play an important role on influencing the effectiveness of the disease control strategies including preventive health programmes. [16,20] The evidence that gaps in knowledge on diseases and disease control measures remain in many least developed countries and that in both developed and developing countries,

variations still exist regarding knowledge on the existence, magnitude and impacts of various diseases is vast. [8] From Guatemala, studies found families holding modern beliefs being more likely to contact modern health providers than the families holding other beliefs [21]; malaria was one of the common diseases, yet people had different knowledge and perceptions about its nature and different practices towards its control. [22] From Nigeria and several other West African countries, studies reveal existence of inadequate community knowledge about onchocerciasis. [23] In Baringo district, Kenya, about 40% of the household members interviewed were found associating malaria with aetiological factors like wild vegetables, dirty water, and fresh un-boiled milk. [24] Another study also in Kenya found the majority of the caretakers of children under five years knowing mosquitoes as the malaria-transmitting vectors, but about 50% of the responses associating malaria with cold weather. [25] In Tanzania evidence reveals community knowledge and perceptions as an important factor influencing people's health seeking behaviour. [26]

Moreover, a study undertaken in Kilombero and Ulanga districts, Tanzania found some community members associating Onchocerciasis infections with rivers by perceiving that this disease could be avoided if people were not taking a bath using river water or drinking the river water (William Kisoka, NIMR, per comm.). Even for malaria a few studies in Tanzania have recognised local explanations for symptoms of this disease possibly leading to the attribution of different causes for the disease and driving some people to seek different treatments. [27] In the northeast of Tanzania, for instance, one study found some household members believing that malaria could be transmitted through contact with contaminated water and as well as climatic changes. [28] Meanwhile, other researchers found in different regions of Tanzania local people associating severe malaria illness conditions with witchcraft or superstitious beliefs. [21,26]

Thus, this paper reports a study carried out between 2002 and 2003 to assess community knowledge and perceptions about malaria, leprosy, schistosomiasis, onchocerciasis, TB, LF, HIV and AIDS, human brucellosis, and HAT. The ultimate aim of this sub-study was to find out the possible implications of the prevailing knowledge and perceptions on such diseases and their practices in terms of health seeking behaviour. Except for human brucellosis, the rest of the mentioned diseases were included in the study because they were in the list of priority diseases for control by the WHO Special Programme for Research and Training in Tropical Diseases (TDR). The major study, part of which was published before examined districts' needs, priority setting, and achievements in relation to TDR diseases and health sector reform in Tanzania. [29,30-31]

## Methodology

### *Study Design, Areas and Population*

Both the major study and present sub-study were exploratory in nature and adopted a multiple-case-embedded design whereby evidence was drawn from different categories of study participants [32], in four districts among which is the Babati district. [29] Among the stakeholders involved were the common village residents and their leaders both at village and ward levels, district health managers, and health facility-based health service workers (HWs). Socio-economically, Babati district is predominantly occupied by subsistence farmers and nomadic pastoralists. [29]

### *Inclusion criteria and Sampling Techniques*

The Babati district (currently in Manayara Region) was one of the six districts of Arusha Region in northern Tanzania at the time of the present study. It is one of the four districts selected for the major study and the reasons for their selection are documented elsewhere. [29] But briefly, the district was one of the districts that started implementing the national basket funding system insisting community participation in health problem identification and health priority setting. [29] Also, various national health statistics records indicated the prevalence of various infections in the district, and these include schistosomiasis, malaria, HAT, TB, leprosy and human brucellosis.

As household members were among the targeted communities, a simple random sampling technique was employed to select a total of 42 heads of households in four randomly selected villages (10 households per village, except in one village where 12 persons were covered). We used a multistage sampling approach whereby after identifying each study districts, a random selection of four wards from different divisions in the district, then one village selected randomly per ward, then a hamlet and finally a household were done. Two dispensaries and 2 health centres (HCs) were covered. At each of these places, 2 key HWs were identified to represent others at that level. Also, three members of the District Council Health Management Team (CHMT), at least 4 members of ward development committee (WDC) and at least 4 from village development committee (VDC) were identified. Additional details on the sampling approaches adopted in selecting the study sub-samples are detailed elsewhere. [29-31]

It was found unnecessary to cover sample size of the households per district for these major reasons: one, the experience obtained from the tools pre-testing and pilot survey phases in preparation for this study whereby it was found that the researcher could stay with a participant by not less than 40 minutes because of some seemingly sensitive or interesting topics talked about; the responses/answers coming out from each of the successive participants were quite similar and recurrent, hence prompting the researchers to find no need for having a large sample size; the study

purpose was not to come up with statistical comparisons of the answers/results on the issues under study, but a general understanding on community members' knowledge and perceptions. This was a relevant approach since ethnographic and other social studies may allow a sample of even less than sixty percent of the individuals/cases [33], although the validity and shortcomings of this approach is discussed at the end of this paper.

### *Study Themes/Questions*

The key study issues were related to participants' knowledge and perceptions or views about the existence of the specified TDR priority diseases under study in their areas as mentioned above; community health seeking behaviour towards such TDR diseases and any other diseases of public health importance as identified by the study participants; availability and/or shortages of health care services for such diseases; and potential mechanisms for such disease control. The knowledge was assessed in terms of one's reported awareness of whether a particular disease existed in their areas or other places in Babati district and the ability of such individuals to identify the symptoms, signs and causes/nature of the disease.

### *Data Collection Techniques*

A mixture of data collection techniques was employed. The methods used include (a) semi-structured interviews (SSI) with heads of households at village level; (b) In-depth interviews (IDI) with HWs; (c) Focus group discussions (FGDs) with local government leaders at village and ward levels; and (d) IDIs with local government leaders. The latter leaders include those responsible for community health development affairs and in particular these were members of community development committees (finance, planning, social security, water and health), and at village level they are called village development committees (VDC). At ward level, the latter kinds of leaders are known as members of ward development committees (WDC). Other techniques include (e) IDI with members of the district CHMT, and (f) Researchers direct observations in the study fields. Data quality was ensured through close supervision and daily review of the data collected to avoid losing memory of what had been done [32] and making corrections or searching more information to fill the gaps where possible and necessary.

### *Data management and analysis*

In terms of quantitative data, those coded from the SSI with household members were handled (both for entry, cleaning and analysis) using the EPI6 software package. As only 42 individual household members participated in SSI, no detailed statistical analysis was performed to relate or compare the types of the responses obtained with the characteristics of the individual respondents. As for qualitative data, the key points from open-ended questions in the SSI were also taken as they seemed to be useful and

this was done manually (no use of software). Same method was applied when dealing with the field notes taken during the IDI and group discussions and this involved a qualitative content analysis approach. Under this approach, the data were organized in such a way that the main contents were summarized according to how they featured in the views expressed by the study participants and in so far they seemed to answer the specific study questions for achieving the study objectives. Field notes from interviews, observations, and group discussions, were validated by analysing the transcripts made out of the audio-taped cassettes for the FGD and IDIs.

### ***Ethical considerations***

The overall study was approved at national level by the Medical Research Coordinating Committee (MRCC) under the MoH through National Institute for Medical Research (NIMR) Secretariat. Procedures of seeking informed consent from the regional, district, ward, village, and health facility authorities, as well as from all the categories of the study population mentioned above were followed. [29] Among the issues covered, the approached individuals were asked to sign an informed consent form if they were voluntarily willing to participate in the study, after being explained about their freedom to decide participation and withdrawal from the study if they wished to, without pressure or any negative consequences should they decline from enrolling or continuing with the study. They also received explanation regarding the purpose of the study and their ability of the research team to comply with keeping any information that seemed to require being confidential at the stage of present study results dissemination.

## **Results**

### ***Sources of care and health seeking behaviour of the residents and reasons***

Reports from all categories of the study participants indicated the common belief driven health seeking behaviour in the local community settings. According to the CHMT members and members of the WDCs and VDCs, community knowledge on symptoms, signs and causes of some of the infectious and communicable diseases was low. Same view was shared by the SSI respondents and FGDs held at community level. In all the different categories of the study participants, lack of awareness of health problems was claimed to have drive some residents consult traditional health practitioners before contacting formal HWs at modern health facilities. Among the traditional health providers who were consulted are the herbalists and spiritual healers (mainly the witchdoctors). All the different categories of the study population were of the claim that diseases of communicable or infectious nature remained to exist partly due to the shortage of essential drugs and inadequate laboratory services for essential diagnoses as well as facilities for blood

transfusion at health facility levels. On the other hand, the long distance travelled to reach the nearby health facilities discouraged people to contact modern facilities. However, testimonies were given about some people who despite their living within a walking distance to the nearest health facility also consulted the traditional health practitioners first or totally rather than contacting the modern facilities. This was experienced for various health conditions including those under the present study as well as those related to maternal health such as childbirth.

### ***Health care supply related shortages influencing people's health seeking behaviour***

On the issue of drug shortages was said to be related to the demand exceeding the supply, particularly when a particular health facility is found to attract even the residents living outside of the facility's catchment area. According to some of the members of the VDC and WDCs, drug kits provided by the government to a particular health facility each month sometimes do end before the time planned for the new kits to be supplied. In both the FGDs and interviews, the lack or shortage of essential medicines and laboratory facilities was claimed as a major disappointment to communities, especially those living in the peripheral areas far away from modern health facilities.

According to staff at Magara government dispensary, it was not uncommon for patients to be referred to Magugu Health Centre (25km away) or Babati District Hospital (also located at more than 25km away) for laboratory examination and other prescriptions. Similarly, experience was shared about villages like Matufa whereby people had to travel far away up to Magugu HC and those living in villages like Endacham had to contact Bonga HC for laboratory services. This made life hard for the patients who could find no means of transport other than having to walk. In this way, opting for self-medication using local herbs or contacting traditional health practitioners was not uncommon. This added another inconvenience apart from the acute shortage of clinical staff and nurses.

Staff shortages was reported to result into a significant number of the clients missing the desired services or the patients concerned having to wait long times for the services. The participants from other villages gave an example of the pregnant women living in remote settings who were dying on their way to seek care at modern health facilities and this is after they had walked long distances helplessly after missing a reliable means of transport. Meanwhile, concerns were expressed by community members (including their leaders) regarding the: (a) local traders who occasionally stocked the expired drugs; (b) use of donkey carts to carry patients (including the pregnant women who were in labour) to and from health facilities. This evidence was confirmed by the research team during the data collection period e.g. on from Magara village to Magugu HC.

During rain seasons, the only means of transport used by then by the residents of the latter village/ward apart from walking was either bicycles or donkey carts.

**Knowledge and perceptions about malaria and a few other infectious diseases**

There seemed variations in the degree of knowledge among different categories of the stakeholders involved in the present study. Table 1 shows summary statistics of the frequency of the SSI household respondents' views on whether the identified diseases existed in Babati district.

**Table 1 Frequency of SSI household respondents' perceptions about burden of selected diseases in their village areas or other places in Babati district**

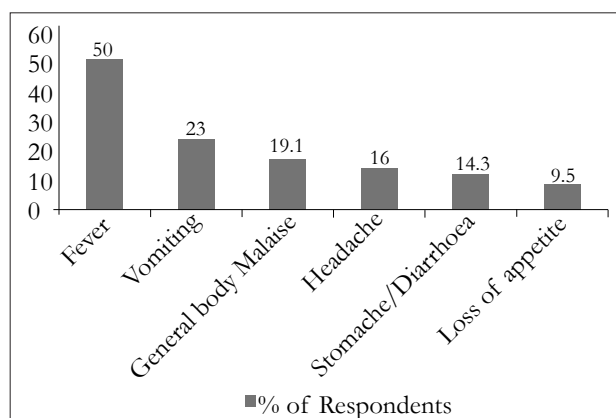
| Disease                 | Q. To the best of your knowledge is (e.g. malaria) a problem in Babati district including this village where you live? (N=42) |        |                |
|-------------------------|---|--------|----------------|
|                         | Yes (%)   | No (%) | Don't Know (%) |
| Malaria                 | 100   | 0      | 0              |
| Tuberculosis (TB)       | 66.7  | 0      | 33.3           |
| Leprosy                 | 38.1  | 0      | 61.9           |
| Schistosomiasis         | 38.1  | 9.5    | 52.4           |
| African Trypanosomiasis | 11.9  | 0      | 88.1           |
| Onchocerciasis          | 0   | 0      | 100            |
| Lymphatic Filariasis    | 19  | 0      | 81             |

As shown in Table 1, only Onchocerciasis was viewed by all as non-existent, the rest lowly or highly rated. Nevertheless, awareness of the existence of a particular disease did not reflect one's knowledge of the symptoms and signs associated with such a disease.

**Malaria**

Of all the 42 household members involved in SSI, 92.9% (n=39) perceived malaria to be the most disturbing and burdening. However, knowledge on symptoms and signs of malaria was low and varied among respondents.

The leading conditions mentioned were fever, headache, vomiting, general body malaise, stomach-ache which is sometimes accompanied by diarrhoea, and loss of appetite. Some of these conditions, for instance, fever and headache, were treated with traditional herbs through self medication or consultation with other locally experienced people. Anaemia, visual difficulties, and jaundice each were identified by only one person (<3%) among the household SSI respondents (Figure 1).



**Figure 1 Knowledge on symptoms and signs with malaria among heads of interviewed in Babati District, Tanzania (N=42)**

Sixty nine percent (n=29) of the SSI respondents mentioned mosquitoes as the main vector. However, they could not all specify that female mosquito species was actually responsible. The remaining respondents associated malaria transmission with mosquito bites meanwhile believing that malaria could affect people who drank dirty water or water contaminated with mosquitoes. At Magugu ward level, the members of WDC during a FGD also identified malaria as the leading communicable disease in their area. They also perceived malaria as being contributed by the presence of stagnant waters in the rice farms found in rift valley with climatic conditions supporting mosquito breeding. Moreover, they believed that the mosquitoes breeding in those sites could eventually bite the farmers cultivating rice even during day times as they do at evening and night hours while people are sleeping in their huts. As for methods potential for malaria prevention, apart from use of insecticide-treated bednets (ITNs) mentioned by 59.5% (n=25) of the SSI respondents and other conventional methods commonly known, 21.4% (n=9) of the respondents in the SSI could mention boiling water as one of the preventive methods. Opinions were given about ITN use not being as effective as expected because the majority of rural household members could not afford to pay even for the so-considered discounted ITN prices under the National Discount Voucher Scheme. However, this point was criticized by CHMT members and frontline HWs in that the residents especially men were spending their family money on taking local brews and leaving their families helpless on health needs.

Opinions were also given about the physical living environment supporting mosquito breeding sites in many places, as indicated by stagnant waters, petty and large dry pot holes on the ground in the streets near the residential houses. Poverty was also perceived as a barrier since people were said to be still living in houses built of mud walls, un-cemented floors and roofed with grass or palm thatches, lacking ventilation and no mosquito gauzes. These features were confirmed by the observations made by the study team.

The team also found a considerable number of the residents living with animals such as goats, sheep, donkeys, cows and chicken in the same houses. According to the village health workers (VHWs) involved in the FGDs with villagers, this was a great constraint to effective malaria control through community sensitization on adopting certain preventive measures.

### **Tuberculosis**

TB even though was perceived by about 67% of the SSI respondents to exist in the study areas, 47.6% (n=20) of such respondents had no idea about its symptoms and signs. Among the only 21 who expressed to know the conditions for TB, 57.1% (n=12) and 38.1% (n=8) did mention coughing blood, loss of weight and emaciation; whereas each of the following conditions were stated by only one respondent each: chest pain, rise of shoulders, and tightening of chest. The main factors perceived to cause TB were also investigated and the responses obtained from the respondents out of all 42 interviewed were related to such behaviours as sharing containers when taking beer, local brews or other drinks, eating raw (un-boiled) meat e.g. beef, and drinking raw milk. Other conditions pinpointed by only 7.1% (n=3) respondents each include: sharing the same cigarette or inhaling the smoke from a cigarette smoker, sharing food containers, and sleeping in dirty environments. At least two respondents identified the inhaling of air exhaled by a TB patient and performing heavy duties as the causative agents of TB: Others mentioned by only one respondent each include: stepping on sputum, carrying heavy loads, and living with livestock in the same and poorly ventilated house. Four respondents did not know the nature or causes of TB.

In all of the four villages it was viewed by several village members including their local leaders that TB prevailed partly because of low community knowledge of this disease and modes of its transmission. Also, sharing utensils was seen as a culturally rooted behaviour whereby eating on the same plates/bowls and sharing drinks using same vessel or straws was positively perceived and valued to illustrate as a kind of brotherhood and trust in each other's health. Some of the participants suggested the need for TB patients to be put in quarantine, and in order to justify this point, one participant complained during a FGD at one village as follows: *"A patient coughs and spits around others, what do you expect!"* The suggestion of keeping the TB patients in quarantine was strongly criticised by other community leaders, as one statement reflects: *"You can't tell a husband with TB to sleep separately from his wife, or to stay away from his family, it is impossible!"* It was interesting to hear from critics in the same groups arguing that keeping patients in quarantine could be a violation of human rights.

Commenting on the issue of cultural values, one of the ward health officers remarked: *"Even those under drug dose, or who have just completed treatment do continue sharing utensils with other people"*. Majority of the participants in all the study

villages admitted that the long-rooted cultural behaviour of sharing a residential house with animals and drinking raw milk or raw meat and blood among most of the indigenous Maasai and Barbaig (Iraqw) ethnic groups were risky factors exposing such people to TB infections since the animals which such people kept were among the chief carrier agents. This view was consistent to that of the professional health workers at health facility and CHMT level.

FGD participants at Gidas ward viewed that the persistence of TB in most areas of Babati district could be attributed to a general lack of laboratory diagnostic facilities and poor community compliance with drug intake. Poor adherence to TB prescriptions was perceived to have been partly contributed by the occasional TB drug stock-outs at the designated health facilities. This forced the patients confirmed or suspected of TB to travel as far as 15 km to up to Bonga HC or Babati district hospital for medical check up and treatment. Those who found this to cause inconvenience to them decided to stay at home by trying self-medication or contacting traditional health practitioners. It was added that even when the dispensary in-charge in liaison with the ward government authority were prepared to follow TB and other essential drugs from Babati district hospital at moments of emergency shortages at the dispensary, the problem of transport remained a limiting factor. In contrast, the district medical officer (DMO) and other CHMT members claimed that TB and Leprosy were delivered through a special national vertical programme, namely the National TB/Leprosy Control Programme (NLTP). This programme ensured that essential drugs were sufficiently available in stock and regularly distributed to all health facilities, a point that was not embraced by all community leaders and their subordinates. However, the district officers did not deny the reports about the existence of transport difficulties in some remote areas.

### **Leprosy**

As shown in Table 1, the majority of the SSI household respondents were unaware if leprosy existed in their areas, although they were aware of some of the leprosy conditions when they were asked to express their knowledge. Only 11.9% individuals interviewed at household level stated to be totally unaware while those claiming to be aware identified either one or several of the following conditions: losing fingers (finger cuts), having sores/rushes on the skin. Similar conditions were stated by majority of the community level FGDs members. Furthermore, the following conditions were mentioned by at least one individual household respondent: paralysing, failure to get healed when injured, and having swollen hands. Skin contact with a leprosy patient or eating with a leprosy patient was mentioned by at least one and at most three SSI household respondents.

With regard to transmission of the infections, some community members showed to believe that leprosy was transmittable between people by superstitious or magic powers. In Magara ward, the villagers lamented: *"If you come*

into conflict with a person coming from an [...] tribe (name reserved) in [...] district (name reserved), then you have no way of escaping from getting leprosy. Those people are very wicked since once they look at you with their sharp eyes, you automatically get leprosy” (a member of the village health committee). It was added: “If you eat food and after you have finished you forget or fail to wash your hands properly by leaving some oily substances on your fingers and suddenly the ‘X’ people come to notice this with their sharp and powerfully harmful eyes, my friend you are in trouble of getting leprosy on the spot” (a member of village government). The rest of the participants in the group discussion session supported the latter two points by seeming to nod and murmur in Kiswahili, *Ndiyo, Ndiyo; Sawa, Sawa* meaning, ‘Yes, Yes; Sure, Sure! In attempt to verify that they knew what they were talking about leprosy, the research team were shown one person in one of the study villages who recovered from leprosy, by showing that person to have a skin colour changed and some of his fingers being absent.

### ***Onchocerciasis***

It was interesting to find that 100% of the respondents in SSI with householders and FGD members at village level in all the study localities reported to have heard about onchocerciasis either through other people or the national radio. However, neither any one of them said to know the symptoms, signs, causes, and control measures for this disease, nor knew whether this disease really existed in their localities and other areas of Babati. Even after the researchers had explained about the main features of this disease, including unrelenting itching, chronic skin changes, visual impairment or complete blindness, none of the individual household members in all villages seemed to be familiar with any person suffering or who have ever suffered from the disease. Instead, some of them insisted that the blindness was caused by dust or other infections (e.g. trachoma), kitchen firewood soot and was common among the very old people. The same experience was expressed by the FGD members in all the study villages, as well as among the ward level officers. Even the district health officers’ report had no data on this disease in the district.

### ***Lymphatic Filariasis***

Although the majority of the household respondents and community members were unsure on whether this disease existed in Babati district (Table 1), some seemed to know of its conditions. Those reporting to know, acknowledged feedback from the community HWs who were employed temporarily by the National LF Elimination Programme (NLFEP), the NLEFP Officers and Radio Tanzania (today TBC-2). Among the SSI household respondents, at least 64.3% (n=27) and 4.8% (n=2) recognised a patient living with elephantiasis and hydrocele, respectively. Five heads of households perceived hydrocele as being acquired by people who had used to live along the coast of the Indian Ocean in Tanzania or Kenya. As for the causes, most 80.9% (n=34) of the SSI household respondents recognised mosquitoes

as the vector, but could not identify the mosquito species responsible. One village member in Magara village believed that walking bare-footed was a risk factor for contracting filarial worms.

Village and ward level leaders/officers in Gidas ward FGDs collectively did not find LF being common in their areas. Despite indicating to know at least two residents living with lymphoedema in their ward, they perceived that such people were infected elsewhere outside Babati district. Knowledge about the real causes of the disease was also almost non-existent among these members. In Bonga village, for example, one member of VDC asked: “Is it true what we hear that doing sex with a person with hydrocele contributes to transmitting the disease to another person?” Several FGD members in Magara village perceived lymphoedema to be signified by water swelling in a person’s legs and caused by a person contacting the water containing the vectors that transmit LF. They believed that the people at most risk were those living and working in rice growing fields. According to CHMT members, no case had been recorded on LF in Babati district.

### ***Human African Trypanosomiasis***

As shown (Table 1) only a few (11.9%) of the SSI household respondents reported to be aware of existence of this disease in their district. These respondents could associate HAT conditions such as ‘falling asleep all the times, high fever, getting confused and urinating blood’ with the disease. However, these conditions were mentioned by less than five respondents, each. Knowledge about how the disease is transmitted varied among the respondents (as among the FGD members at community level): tsetse flies as a vector when biting people and animals were recognised by 26.2% (n=11) respondents while mosquitoes biting people were perceived by 7.2% (n=3) as contributing agents. At least one person perceived that people with tendency of staying outside of their houses where they are burnt with direct intensive sunrays, or over-eating could also cause the disease.

In Magara ward, the FGD members at village and ward levels expressed to be sure that trypanosomiasis prevailed in their place, and could mention that tsetse flies (known as *ndorobo* in Kiswahili) were the vector causing this disease. The commonness of this disease was also reported by the Matufa VDC members and the Magugu HC staff. These like their fellows from other villages/wards identified the areas around the Tarangire National Park and in bushy areas of Kokomay near the rift valley hills and caves to be the most endemic. Concerns were expressed about patients having been referred to Haydom Lutheran Hospital near Tarangire National Park for services due to lack of such services at the nearby dispensaries and HCs. The majority of the FGD participants in all the four villages visited as well as their leaders at ward levels argued that one could notice the condition of this disease to the affected persons who seem to experience long time of falling asleep uncontrollably, sometimes accompanied by periodic fever episodes.

### ***Schistosomiasis***

Symptoms and signs of this disease were not known by 33.3% (n=14) of the individual household SSI respondents. Those indicating to know the tracer conditions mentioned include the following: urinating blood, as stated by 54.8% (n=23) respondents and feeling pain during urination, as stated by 7.2% respondents. Other conditions mentioned by at least one person each, include: 'people becoming mad', and 'excreting stool containing blood during rainy seasons'. Regarding what cause(s) the disease, the elements mentioned include: contact with un-boiled dirty water dwelt by snails, as indicated by 30.9% (n=13) respondents, while at least one person mentioned one of the following conditions: entering into sexual intercourse with a person with this disease; skin contact with a snail; and skin contact with water containing frog's eggs.

Some FGD members claimed that schistosomiasis existed in their areas for many years, but the trend showed that it has been greatly controlled to the extent that it was nearly reaching elimination: "*Schistosomiasis existed since 1974, but has almost ceased because the government intervened and advised people to shift and reside in other places, although other areas in this district still have it*" (Matufa village). Other FGD members perceived this disease was perpetuated by people's unhealthy behaviours, including urinating or defecating haphazardly in the surroundings and this happened mainly among the families with no latrines, leading to urine and stool widely spreading in the residential surroundings or farmlands. The following WDC members argued while commenting on this issue: "*You know, people do not use latrines because they see that using water to wash their hands after a long-call signifies filthy. I don't know if it is a matter of not understanding or what! They prefer to go to the fields for a long call because that way they can use plant leaves to clean themselves*". This testimony was confirmed by reports from the Ward Councillor who added that even some of the families with latrines do not use such latrines at all while such facilities were just built to avoid being penalized by the health/government authorities if they were found with none, by paying a fine.

Apart from schistosoma infections, the FGD participants and their leaders at the WDC in Bonga ward added that people in that area were frequently facing diarrhoea by giving out bloody stool. They also claimed that helminthes were a common and serious problem in their areas and apparently throughout Babati district. This situation was perceived to be perpetuated by the poor sanitation and hygiene behaviour of the residents, as perceived by the frontline HWs found at the Bonga HC. The FGD members in Matufa village challenged the view that most households in their village had no even low-cost and simple structured latrines primarily due to unhygienic behaviours. Their reaction was that the health and government authorities were supposed to appreciate that the soil/ground covering that area was predominantly clay in nature, with a raised water table whereby pit latrines do

collapse a few days after being constructed. The respondents added that the majority of the residents were too poor to construct permanent and modern latrines. Meanwhile, FGD members from all four villages/wards perceived that low community use of latrines not only contributed to the transmission and prevalence of schistosomiasis, but also was the major cause for the outbreaks of cholera and prevalence of intestinal worms in many areas in the district. In Magara ward, FGD members recognized that typhoid was also highly prevalent in their area along with Schistosomiasis mainly due to some people commonly defecating along the slopes of the Mbulu hills, part of the rift valley near the Magara village while they were on their way from Mbulu district to and from Magara dispensary for medical services.

### **Other problems considered are a priority in the study communities**

#### ***Human Brucellosis***

It was interesting to find majority of the community members, like the professional staff, knowing this disease to be a zoonotic one. All the different categories of the study participants perceived the disease to be highly prevalent in the district, and were aware that the high number of flocks of cattle and other animals living with people in the same homestead were the primary cause of the existence and prevalence of this life-threatening disease. Use of local traditional medicines including herbal medicines was reported to be commonly used as a treatment for brucellosis, but for prevention, none of the responses indicated to state the need for and availability of the vaccines.

#### ***HIV and AIDS***

This was mostly feared as increasingly becoming a common and rapidly growing pandemic, threatening to individuals and general public. It was interesting to hear most of the participants in all methods employed in the present study to collect the data arguing that the increasing HIV infections could undermine the efforts in place for controlling other diseases of public health significance. HIV infections were perceived to be widely transmitted by businessmen and other people living in towns who occasionally visit the villages with persuasive money to bribe easily the money thirsty people at the risk of health. Screening was perceived to be an important service for establishing the magnitude of the infections and prevalence of HIV: "*I think in five years to come the situation is going to be serious because people who were born here and later left for school or business purposes in towns come back with HIV and spread it in the community. I think if community members are screened, over 400 at [...] HC only (name reserved) could be found HIV positive*" (a stated FGD member). Unsafe sexual practices partly contributed by excessive drinking of alcohol during such events as wedding ceremonies and public and religious holidays, and users of illicit drugs were mentioned as risk factors of HIV infections/transmission as perceived by the FGD members in one ward.



## Discussion and Conclusions

### *Community knowledge of communicable diseases*

The effective community participation (CP) in the war against communicable diseases requires adequate public understanding of the diseases affecting such communities. Of the key findings from this study, we have seen that the study participants at local community levels were familiar with at least some of the infectious diseases including their causes and possible health outcomes, and saw malaria and HIV/AIDS as the most life threatening diseases. However, the immediate observations indicate that the majority of community members had low knowledge about the nature, causes, symptoms and signs, mode of transmission of such diseases as Onchocerciasis, leprosy, LF, and partly human brucellosis.

In particular, diseases like schistosomiasis and leprosy were perceived by some community members to be associated with poor personal hygiene practices, leprosy with supernatural powers like witchcraft and envy from bad hearted people, and LF transmission with coming into sexual intercourse with the a person living with the disease. We have also noted some misconceptions people still had regarding malaria causes and modes of transmission, for example, associating malaria infections with contacting or drinking dirty water. These findings are consistent with reports from elsewhere in East Africa [34], verifying what was observed before in other countries. [16] This implies that designing hygiene related promotional messages to educate and sensitize the public on particular diseases may be a potential measure. Thus, more needed to be done to enhance people's knowledge on these diseases, otherwise it would remain difficult for the health authorities to effectively engage communities in the control (including timely prevention and appropriate treatment) of the diseases in question. Research on the status of knowledge and perceptions about diseases should continue as part of monitoring and evaluation of health education programs. According to experts, disease control programmes including those related to personal and community hygiene may change people's behaviours, especially if they are supported by local research and use of locally appropriate channels of communication repeatedly and for an extended time. [35]

It was interesting to find communities appreciating the duty of village/community health volunteers/HWs, vertical health programme officers and mass media institutions for having informed the communities on specific disease issues. This is good news for disease control programmes. Therefore, health professionals including managers, service providers and researchers should not always doubt much or at all when getting feedback from those generally considered to be lay individuals in the community on the existence and burden of particular health problems. The tendency to underrate lay people's knowledge on nature, causes, and methods of controlling particular diseases may be wrong, as experts have

observed. For instance, one study in South Africa found that the answers obtained from the rural residents using a verbal autopsy data collection technique provided similar results to clinical records about deaths caused by various diseases. [36] A similar study in Tanga region, Tanzania found that 75% out of about 2300 school children who had been asked whether they had urinary Schistosomiasis were correct in their self-diagnosis after a microscopic cross-examination. Moreover, the association of blood in urine with Schistosomiasis based on microscopic examinations was consistently validated by reports from studies in other countries e.g. Malawi, Zimbabwe, DRC and Zambia. [37] As for zoonotic diseases, health study reports verify the existence of, for instance, human brucellosis that was highly acknowledged to exist in Babati and widely known among the local communities as in many other parts of Tanzania where livestock is widely kept. [38]

### *Health seeking behaviour and availability of health care services*

Community and health facility based stakeholders viewing that shortage of essential supplies such as drugs, laboratory facilities as well as health service personnel had contributed to disappoint the target users of the services especially those from remote villages makes sense. This is because the same has been, and continues being, a public outcry even in other districts where the same study was carried out. [30-31] Nevertheless, it is good to be aware that even when the facilities may be in place with committed HWs, some community members may not use them at all or adequately if they have little (or no) knowledge or if they negatively perceive certain diseases or service providers. Theories and empirical evidence verify the significance of people's beliefs, knowledge, and perceptions about diseases in shaping their health behaviours or practices [39]. Indeed the beliefs expressed by the community members in the present study reveal the same truth.

It is surprising that some communities regarded their neighbouring tribesmen to cause leprosy to other people they hated. Given this myth, tendency of the community members to consult traditional healers in attempt to seek spiritual power and particularly superstitious power as a way of treating this disease could not be uncommon. These facts bring us to the inference that the health education programmes were yet to be effective in changing the mindset of such communities. We have also noted from the present study that some ward leaders doubted whether the community members who behaved un-hygienically including misusing toilets did not really know the consequences of their behaviour. Possibly such people knew how bad it was but decided to respect their traditional beliefs and values including those of sharing eating materials (e.g. drinks and utensils) as well as living in the same huts with their tamed animals. This study is an eye opener to further studies to explore the manner and extent to which perceptions and traditional beliefs and practices shape people's health in Tanzanian communities, and how

effective interventions could help reduce the burden of specific diseases at community levels. That is why in 2006, during its 38th Assembly, the WHO recommended her member countries to ensure that the control of malaria, for example, should be an integral element of the primary health care system in their countries, emphasis being that the programme authorities concerned had to understand the socio-cultural and economic determinants of diseases. [40]

The concern raised by peripheral villagers about the accessibility barriers to health care facilities due to either the long travel distance or lack of means of transport especially during the rain seasons implies that the reported communicable diseases might prevail if the basic services for controlling them continued being inaccessible. That is why experts continue identifying the need of supporting use of community based HWs including VHWs who could help reaching at least the simple basic services to people living in remote settings underserved by the existing formal health care system [41], as well as the national and district government authorities continuing to provide financial and other kind of support to outreach services performed by skilled health facility based HWs who are sometimes assisted by community health volunteers. [42, 43]

### Strengths and limitations of the Study

In spite of the many interesting findings presented and discussed above, the present study lacked a detailed statistical analysis due to, as earlier mentioned, a small sample size effect. [29,30] We appreciate that a larger sample size of the study households and HWs could have provided a large amount of the data to be used for at least a detailed statistical analysis comparing the views expressed by the individual household SSI respondents with different socio-economic characteristics and experiences. Also, the present study did not go deeper to assess possible scenarios whereby professionals and lay persons might be sharing similar or different concerns/perceptions about certain diseases. This would have helped the health program officers or disease interventionists to take a full advantage of any coincidental perceptions when designing and implementing particular interventions required to be highly/widely acceptable to the society concerned. This paper also reports the findings from a study that was undertaken long time ago, hence some of the issues observed might have changed now. This means, the conclusion presented below should be taken cautiously. Nevertheless, the study still provides useful evidence justifying the need for systematic disease surveillance activities to be done regularly by involving local communities and using the surveillance data to improve the recording and reporting of the traditionally prioritized diseases and the previously neglected while being important from public health viewpoint.

### Authors' contributions

GMM conceived the study, participated in all stages of the study, lead the research team, wrote the research report

as well as the first and final versions of this manuscript (MS). VKB and MLK participated in the refinement of the instruments, data collection, transcription of FGDs and IDIs, and commenting on this MS. Prof. KJN assisted GMM in research project leadership, with guidance from Dr Erick Blas from WHO Geneva, and drafting the research proposal, collection of data and their analysis, report writing and commenting on the present MS.

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### Declaration

The authors declare no conflict of interest in relation to presentation of this manuscript.

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