KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING RIFT VALLEY FEVER AMONG COMMUNITY MEMBERS, HEALTH AND VETERINARY WORKERS IN KONGWA AND KILOMBERO DISTRICTS, TANZANIA

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KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING RIFT VALLEY FEVER DISEASE AMONG COMMUNITY MEMBERS, HEALTH AND VETERINARY WORKERS IN KONGWA AND KILOMBERO DISTRICTS, TANZANIA 2012

By

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CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance of dissertation entitled, "***Knowledge, Attitudes and Practices regarding Rift Valley Fever Among Community members, Health and Veterinary workers in Kongwa and Kilombero districts, Tanzania"*** in fulfillment of the requirements for the Award of Degree of Master of Science in Applied Epidemiology of the Muhimbili University of Health and Allied Sciences".

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DECLARATION

AND

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I, Sikudhani Shabani Sasita, I hereby declare that this thesis is my original work I did with the help of my supervisors with the exception of the references to other people's publications which I have acknowledged in this research. I therefore declare that this thesis work has not been presented wholly or partly for the Award of any degree or academic honour elsewhere.

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ABSTRACT

Background: Rift valley fever (RVF) is an acute febrile viral disease caused by Rift Valley Fever virus, transmitted by *Aedes* mosquitoes and other blood sucking insects. It is a global re-emerging zoonotic disease with rapid socio-economic and public health impact. A large RVF outbreak occurred in Tanzania in 2007 and affected 52.4% (n=21) of regions with high (47%) case fatality rate. There is paucity of information on knowledge, attitudes and practices among Tanzanian community regarding RVF. A study was therefore conducted to assess knowledge, attitudes and practices regarding RVF to provide baseline information to design interventions

Objectives: This study was conducted with the aim to assess knowledge of, determine health seeking practice, describe attitudes towards, and determine perception of risk of RVF among community members, health and veterinary workers in Kongwa and Kilombero districts.

Material and Methods: A cross sectional survey was conducted among head of households, health and veterinary workers in Kilombero and Kongwa districts in November 2011. Administered questionnaire and focus group discussions were used to collect data from household members and in depth interview from health and veterinary workers. Multi stage sampling was used to obtain participants. Knowledge and attitudes questions were scored and the mean score analysed using SPSS version 17, INVIVO version 8 used for qualitative data.

Results: A total of 463 community members recruited in this study. Their mean (SD) age was 39.8 (14.4) ranging, 18-87 years. Of these, female were 51.4% and 51% lived in Kongwa district. Majority 87.3% were peasants, 61.8% completed primary education, and 79.0% were married. Out of 463, 452 (97.5%) they had heard about RVF. Mean (SD) knowledge score was 3.1 (2.6) ranging min-max, 0-15.

Of the 452, 369 (81.6%) were not aware of the vectors spreading RVF while 298 (65.9%) did not know its symptoms in animals. Regarding RVF infection in humans, 330 (73.7%) knew about consuming the meat of a dead or sick animal; furthermore 318 (70.4%) were not aware of symptoms. Community's attitude towards RVF was high, with a mean score 24.9 (3.7) ranging, 7-35 scores. Majority 337 (74.6%)

reported seeking care for febrile illness at health facilities. Less than half 110 (24.3%) reported the use of protective gears to handle dead animal while 15.5% were consuming dead carcasses. For 320 (70.8%) and 91 (20.1%) respondents their main source of information about RVF were radio and friends respectively.

Conclusion: The study findings indicate that, knowledge about symptoms, transmission and prevention of rift valley fever among community members was very low in this study, although attitudes are positive. Practices in this study were still risk among community members. Health planners should design RVF awareness interventions targeting to reach these communities and the public through radio and other communication channel on a regular basis.

Keywords: Rift Valley Fever, Knowledge, Attitudes and Practices, Kongwa, Kilombero, Tanzania

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ABBREVIATIONS

CCHF	Crimean Congo Haemorrhagic Fever
CDC	Centre for Diseases Control and Prevention
CFR	Case Fatality Rate
FAO	Food and Agricultural Organization
FGD	Focussed Group Discussion
MMWR	Morbidity and Mortality Weekly Report
MOHSW	Ministry of Health and Social Welfare
NABC	National Agricultural and Biosecurity Centre
NBS	National Bureau of Statistics
OPD	Out Patient Department
RVF	Rift Valley Fever
RVFV	Rift Valley Fever Virus
TFELTP	Tanzania Field Epidemiology and Training Programme
WHO	World Health Organization

DEFINITION OF TERMS

Knowledge:

Awareness of knowing cause, symptoms, mode of transmission and available prevention strategies of the Rift valley fever disease

Attitudes:

Is a favourable or unfavourable evaluation of something, positive or negative evaluation of people, object or idea (Zimbardo *et al* 1999). In this study the concept is used to refer to community member's evaluation of Rift Valley Fever and how it is perceived as a public health problem

Practices:

Conscious effort and behaviours of community members undertaking to avoid contracting the Rift valley fever

Health workers:

Medical practitioners including all cadres of clinicians and nurses

Veterinary workers:

In this study include veterinary officer, animal scientist and extension officers

Community members:

Include individuals aged 18 years and above living in Kilombero or Kongwa district

CHAPTER ONE

1.1 Background

Rift Valley Fever (RVF) is a viral vector borne zoonotic disease caused by Rift Valley Virus, a member of *Phlebovirus* genus in the family *Bunyaviridae* (Linthicum *et al* 1985, Mundel *et al* 1951, Swanepoel *et al* 1976). The disease affects both animals and human and has been associated with epizootic and epidemic in different countries and occasions. The animals acquire disease through bite of infected mosquitoes and from animal to human by direct contact with blood, body fluids or tissues of infected animal as well as the bite of infected mosquitoes. Currently there is no evidence of person to person transmission of Rift Valley Fever disease (WHO, 1982, Davies *et al* 2003, Daubeney *et a*l, 1931).

The disease occurrences follow the unusual trend of heavy rainfall leading to flooding, that provide environment for dormant eggs which naturally infected by Rift Valley Fever virus to hatch and rapidly multiply and become prominent mosquitoes populations which results to transmission of virus to animal and from animal to human (Davies *et al*, 1985, Osama 2010, NABC 2010).

The RVF disease largely affect domestic animals such as goats, sheep, cattle and camels and has been associated with abortion in pregnant animal and high mortality in young animals (Davies *et al* 2003). Moreover the RVF virus has been demonstrated to affect a wide range among wild animals including Buffalo, Rhinoceros, Kudu, Impala, Elephants, Kongoni (Evans *et al* 2008).

In human the RVFV cause Influenza like syndrome accompanied by fever and headache and occasionally leads to serious complications (Gedes *et al* 2004). About 7-26% of patients of RVF develop severe disease including haemorrhagic syndrome, encephalitis and death (Laughlin *et al* 1979, Van Valden *et al* 1977, Al Hazmi *et al* 2003, Anyangu *et al* 2009). Also 5-20% of RVF patients develop ocular complications including retinitis leading to scotomata and other visual disturbances (Al-Hazmi *et al* 2005).

Since the isolation of RVF virus in Naivasha, Kenya in 1931 the disease remained endemic in many countries of Sub Saharan Africa with social and environmental

factors contributing spread to other countries until the first episode of RVF outbreak outside Sub Saharan countries was reported in Egypt 1977 with 18,000 human cases and 600 deaths (El Akkad 1978). High morbidity and mortality of Rift Valley Fever have been reported through various outbreaks.

In the recent decade, RVF cases have been confirmed in Saudi Arabia and Yemen in 2000, marking the first documented evidence of RVF virus transmission outside the African continent (Al-Afaleq *et al* 2003, Madan *et al* 2003, AbdoSalem *et al* 2006, Al Hazmi *et a*l 2003, Anyamba *et* al 2006). The concerns have been raised that the disease could extend to parts of Asia, Europe and other countries that had never experienced the outbreaks in Africa (House *et al* 1992). The RVF outbreak in Saudi Arabia reported 889 human cases and 124 deaths and Yemen 1328 human cases and 166 deaths respectively (CDC 2000).

Tanzania had not reported RVF cases since 1978, although epidemics have been reported in neighbouring countries such as Kenya (1997/98), Malawi (1990) and Zambia (1993). The major outbreak of Rift Valley Fever in Tanzania was detected among humans in January 2007 in Manyara region which borders to Kenya. In this outbreak 309 human cases and 144 deaths (CFR= 47%) were reported from twenty five district of 10 regions with socio-economic losses in communities (Mohamed *et al* 2010).

The recurrence of RVF is now reported in many African countries, Kenya has reported 10 episodes the current being in 1998 and 2006, South Africa 9 episodes the current in 2008 and 2010, Egypt 4 episodes the current in 1999 and 2003, Somalia 4 episodes the current in 1998 and 2006 and Tanzania 5 episodes however the last two being well documented (Osama 2010)

Occurrence of large outbreaks of RVF in Egypt 1977, Kenya 1997-98 and other parts of Africa and outside Africa such as Saudi Arabia and in Yemen 2000 has increased the virological and entomological knowledge regarding the virus and vectors for RVF (Shope *et al* 1982). There is little evidence on epidemiology, ecology, risk factors for transmission and economic impacts of RVF reports and studies. However, there is a paucity of data on knowledge, attitude and practices towards RVF among

health workers, veterinarians and community members towards RVF as the key player for earlier recognition.

1.2 Statement of the Problem

Knowledge, attitudes and practices among communities regarding RVF is not fully known globally including Tanzania. There is paucity of literature regarding this component and level of awareness towards RVF has not been documented or is limited since the isolation of RVF virus in Naivasha Kenya. Majority of studies have focused on RVF virus, vaccine and forecasting model (Osama 2010). Following large outbreaks in Egypt in 1977 and Kenya in 2006/07, virological, ecological, risk factors and entomological knowledge have been documented. Similarly methods for disease prevention and its control have been published elsewhere (Shope *et al* 1982).

Studies conducted in Kenya, South Africa and Sudan have shown that direct contact with infected ruminants (slaughtering or skinning), consuming animal products (raw meat or unpasteurized milk), touching aborted foetus and mosquito bite are potential risk factors of contracting RVF disease (Anyangu *et al* 2009, El Imamm et al 2009, NCID/NHLS report 2011).

Communities behaviour of consuming uninspected carcass or dead animals and lack of awareness about the disease were pin pointed as a cause of high human cases (more than 50% reported in Dodoma and 17% in Morogoro region respectively) in the latest RVF outbreak). A Report showed that some of the inhabitants of Dodoma had a reputation of consumption of condemned meat even from known or unknown diseases (Sindato *et al* 2011). Majority of the confirmed RVF cases in humans had a history of consumption of meat from sick animals; the recent 2007 RVF outbreak resulted to 309 human cases of which 144 died (case fatality rate = 47%) of the disease (Mohamed *et al* 2010).

Apart from human loss, the outbreak resulted serious economic loss at individual and national level. More than 135,444 ruminats were affected of which 34% aborted and 37% (16,993 cattle, 20,913 goats and 12,124 sheep) died which summed worth (4.4million US$=7.6billion Tshs) loss, whereas cattle deaths estimated to be 5billion Tshs. On the other hand market of cattle dropped significantly, during the outbreak

export of cattle to Comoro island dropped by 54 %,(1,183) compared with 2,594 cattle in 2006.

In the course of control of this outbreak, the government spent 3.84million US$ to bring the disease under control including purchasing animal vaccine, public education, training of front liners and investigation (Sindato *et al* 2011).

Kongwa and Kilombero are among of districts with agro pastoral activities which are likely that potential risk factors do exist. For the purpose of early recognition, detection and notification these communities need to have correct knowledge regarding the disease. During 2007 RVF outbreak health messages were conveyed to public through various media. However the level of knowledge among community members is not known. Attitudes towards RVF and practices regarding early recognition, detection and notification and health seeking behaviour in these communities have not been properly documented too. In the presence of this information gap, this study is intended to assess knowledge, attitudes and practices regarding RVF among community members.

1.3 Purpose and rationale of the study

1.3.1 Purpose of the study

The purpose of this study is to assess knowledge, attitude and practice towards Rift Valley fever among community members, health care and veterinary workers in Kilombero and Kongwa districts in Tanzania

1.3.2 Rationale

Rift valley fever disease is a global re-emerging public and animal health problem. It is a major zoonotic threat in category A and its pathogen is potential for international spread. In the current decade, there is an increase (RVF) episodes and the disease have been confirmed beyond the Africa continent (Arabian Peninsula including Saudi Arabia and Yemen) and raised concern that it may extend to other parts of Asia, Europe and virgin areas that had never experienced outbreak.

Tanzania has experienced five (5) episodes of RVF since 1930 in interval of 10-20 years, 1947, 1957, 1977, 1997 and 2007. The recent outbreak created large socio economic impact ranging from human deaths, animal loss and drop in animal market. Few studies have been conducted on Epidemiological aspects, risk factors, entomological aspects and socio economic impact of the disease in Tanzania, However community's awareness of RVF is not well documented.

It is evident that the disease has no treatment rather than supportive therapy, therefore early recognition, detection and notification is important strategy/tool towards RVF prevention, response and control. For this strategy to be attained understanding of knowledge, attitudes and practices among community members, veterinary and health professionals is very important. It is the view of this information gap that a study of knowledge, attitudes and practices among community members, veterinary and health workers in Kongwa and Kilombero is warranted.

The results obtained from this study will provide valuable information to health planners to guide decisions for interventions, coordination and integration of prevention and control strategies of RVF before, during and after outbreaks.

1.4 Research Questions

1. What is the level of knowledge among community members in Kongwa and Kilombero districts?

2. What are the attitudes among community members in Kongwa and Kilombero districts?

3. What are the existing practices with regard to RVF prediction, emergency preparedness and health seeking patterns among community members?

4. What is RVF perceived risk of infection among community members in Kongwa and Kilombero district?

1.5 Objectives

1.5 .1 Broad Objective

To assess knowledge, attitude and practice regarding Rift valley fever disease among community members, health care workers and veterinary workers in Kilombero and Kongwa districts, Tanzania

1.5.2 Specific Objectives

1. To assess knowledge regarding cause, symptoms, transmission and prevention of RVF among health workers, veterinary workers and community members
2. To describe attitude towards RVF among health workers, veterinary workers and community members
3. To determine perceived risk of RVF among health workers and community members
4. To determine health seeking practice in the event of RVF among local population
5. To document and examine existing activities for prediction, emergency preparedness and control among health workers and veterinary worker

CHAPTER TWO

2.0 Literature review

Rift Valley fever is among of the Viral Haemorrhagic Fever diseases with Public health emergency of international concern as defined by International Health Regulation of 2005 and is identified as most global re-emerging zootic threat with rapid spread, socio-economic and public health impact. The Viral Haemorrhagic Fevers are growing threats in various parts of the world with a range of case fatality rate from 2% -90% depending on the family of virus. The RVF virus is estimated to have a case fatality rate of 50% (WHO 2007, EASAC 2008).

The animals acquire disease through bite from infected mosquitoes and from animal to human by direct contact with blood, body fluids or tissues of infected animals as well as the bites of infected mosquitoes. Currently there is no evidence of person to person transmission of Rift Valley Fever disease (WHO, 1982). The RVF virus belongs to the genus *Phlebovirus* in the family *Bunyaviridae* and known to affect both animals and humans (Daubeney *et al* 1931, Meegan *et al* 1988).

The RVF disease largely affects domestic animals such as goats, sheep, cattle and camels and has been associated with abortion in pregnant animals and high mortality in young animals. Moreover, the RVF virus has been demonstrated to affect a wide range of wild animals including Buffalo, Rhinoceros, Kudu, Impala, Elephants, Kongoni (Evans *et al* 2008).

Since the isolation of virus in Naivasha Kenya in 1931 the Rift Valley Fever remained endemic in Sub Saharan countries and subsequently reported in Zimbabwe, Zambia, Senegal, South Africa, Sudan and East African countries (Davies 2010). The transmission of RVF virus in new area was noted in Egypt 1977 where 18,000 human cases and 600 deaths were reported with heavy economic loss (El Akkad 1978)

In the recent decade transmissions of RVF virus have gone beyond the African continent for the first time and cases were confirmed in Saudi Arabia and Yemen in 2000. More than 882 human cases with 124 deaths CFR=14% from Saudi Arabia (Al-Afaleq *et al* 2003, Madan *et al* 2003,)and 1328 cases and 166 deaths

CFR=12.5% from Yemen were reported (CDC 2000, Abdo-Salem *et al* 2006). The largest ever reported RVF outbreak occurred in East Africa 1997-98 which affected Somalia and Northern part of Kenya which estimated to affect 89,000 human cases and 200-450 deaths and considerable loss of livestock (WHO 1998, Woods *et a*l 2002)

The recent outbreak of RVF in Kenya 2006 affected estimated 500 human cases with 158 deaths and the outbreak extended to Tanzania in 2007. This recent major RVF outbreak 52.4% (n=21) of Tanzania mainland regions were affected and majority 72.7%, n=11) had both animal and human infections. About 12 million cattle, 9 million goats, and 3 million sheep were affected and approximately 34% of ruminants were reported to have aborted (Sindato *et al* 2011). In human, 309 human cases and 144 deaths (CFR=47%) were reported. The CFR was higher than ever reported in Sudan 31.5% in 2007, Kenya 26.4% in 1997and 2006, Saudi Arabia 14 % in 2000 and in Egypt 3.3% in1977 (Mohamed *et* al 2010). During latest epidemic Dodoma was the mostly affected region having more than 50% of all human cases probably due to lack of awareness on RVF in the community and habit of consuming uninspected carcass and carcass of dead animals This situation could be attributed to limited community knowledge and probably patients delayed to seek appropriate medical care during the outbreak.

The study of risk factors conducted in Kenya showed that contact with sick animal, consuming or handling products from sick animals, slaughtering or skinning were significantly associated with contracting the disease (Anyangu *et al* 2009).

Another study done in Gezira revealed that 48% contracted the disease by contact of animals, 24% by consuming animal products and 17% they didn't know how they contracted it. (El Imamn *et al* 2009). Also the findings from recent outbreak occurred in South Africa in 2010, 94% of rift valley fever cases reported history of direct contact with infected ruminants (NICD/NHLS 2011) These events presumably explain the lack of knowledge among the community members on transmission route resulting acquiring the RVF disease.

Evidence from other viral haemorrhagic fever studies suggested that, knowledge regarding signs, symptoms and mode of transmission among community and health workers is still low. Study conducted among 500 OPD attendants in New Delhi India on knowledge about dengue fever, its sign and symptoms and preventive practices showed that only 103 (20.6%) persons mentioned at least two symptoms of dengue fever and 11.2% mentioned all three symptoms (Matta *et al* 2006). Another study conducted among 192 residents of Westmoreland, Jamaica regarding dengue fever revealed that only 54% had knowledge about sign and symptoms and about 47% considered dengue to be serious problem (Faisal *et al* 2010).

The study on knowledge conducted among 187 health workers in Pakistan regarding Crimean Congo Haemorrhagic Fever showed that only 57% and 45.2% of doctors and nurses had knowledge about common signs and symptoms respectively. Knowledge regarding handling and isolation of CCHF patient, 65% and 6% of nurse and auxiliary nurses had knowledge. More than 89.7% of health workers were interested to know more about viral haemorrhagic fever diseases (Lakhan *et al* 2002). The literature shows that there has been no evidence of studies done to assess knowledge, attitudes and practices regarding Rift valley fever especially in areas where RVF is prevalent.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study design

This was descriptive cross sectional study design conducted between November and December 2011

3.1.1 Quantitative component

Quantitative methodology provides comparisons and statistical aggregations of data. The purpose of collecting this information was to compare level of knowledge and attitudes among community members. Quantitative part obtained socio-demographic characteristics, knowledge, attitudes and practices of community members regarding rift valley fever disease.

3.1.2 Qualitative component

Qualitative methodology helps to understand life experiences and to reflect on the understandings and shared meaning of peoples' everyday social life and realities (Morse *et al* 1995). In this study qualitative approach has been used to collect the primary data through focus group discussions with community members and in depth interviews with health and veterinary workers to explore their perceptions, views and understanding regarding RVF.

3.2 Study areas

This study was carried out in Kongwa and Kilombero districts, Dodoma and Morogoro regions respectively. These regions represent areas that reported high numbers of RVF cases during 2007 outbreak, nearly 170 and 60 cases respectively (Sindato *et al* 2011). Kongwa district is among of the six districts of Dodoma region. It lies between 5^0 30 and 6 to the South and longitude 36 and 15^0 36 East of Greenwich meridian. The district covers an area of 4,041 km^2 and had a population size of 301,566, of which 132,838 were males and 162, 357 females (NBS 2011 projection).

Administratively the district had 3 divisions, 23 wards, 74 villages and 286 hamlets. The district had a total of 41 health facilities, 1 district hospital, 3 health centres and 37 dispensaries. Two divisions Zoissa and Kongwa with four wards namely Ugogoni, Matongoro, Hogoro and Iduo and six villages of Ugogoni, Nyerere, Banyibanyi, Matongoro, Chimotolo and Chang'ombe were involved in the study. Major economic activities in these communities were agriculture and livestock keeping and major ethnic group is Gogo

Kilombero district is among the five districts of Morogoro region located on the western side of the region. The district lies between latitude 70^0 40' and 9^0 21' south of Equator and between longitude 35^0 20' and 37^0 48' East of Greenwich. The district covers an area of 14,918 km^2 and had a total 321,611 population, of which 162,214 were males and 159,397 were females with 73,393 households (NBS Census 2002). In 2011 population was projected to be 436,772.

Administratively the district had five divisions namely Ifakara, Kidatu, Mang'ula, Mngeta and Mlimba, 23 wards, 76 villages and 360 hamlets. The district had 52 health facilities, of which 2 were hospitals, 4 health centres and 46 dispensaries. Two divisions of Ifakara and Mngeta, with four wards of Kibaoni, Lumemo,Mbingu and Mngeta and six villages of Kibaoni, Ihanga, Mahutanga, Mpofu, Mngeta and Ikule were selected for the study from this district, all sampled villages, wards and division were obtained randomly using multi stage sampling. Major economic activities are agriculture and livestock keeping and has mixed ethnic groups including Ndamba, Mbunga, Ngindo, Pogoro, Hehe, Masaai, Sukuma and Barbaigns

3.3 Study population

The population in this study were adult community members, veterinary workers (district agricultural/veterinary officer and extension officers) and health workers (district medical/health officer and in charges of health facilities) aged eighteen years and above (18+) living in Kongwa or Kilombero district for more than one (1) year before the current study.

3.4 Sample size and sample size calculation

3.4.1 Quantitative component

In order to generate sufficient information of the knowledge, attitude and practices regarding Rift valley fever among community members in Kongwa and Kilombero districts a multi stage sampling method was employed. The formula shown below was used to estimate the sample size:-

$$\mathbf{n= \frac{z^2 * p(100-p)}{\varepsilon^2}}$$

Where:

p is the expected proportion of community members with knowledge on cause/symptom or mode of transmission of RVF. The value for p which was used in this study was 50% since no previous studies were found.

ε is the margin of error set at 95%

z=1.96 which corresponds to 95% confidence interval

$$n= \frac{1.96^2 * 50(100-50)}{5^2}$$

n= 384 persons

The estimated size of the sample is 384 persons. After allowing for non response of 15%, the minimum required number of subjects to be included in the study was$384/0.85 \approx 460$ community members for both districts

3.4.2 Qualitative component

In qualitative approach, different types of respondents were purposively recruited to participate in in-depth interviews and focus group discussions. A total of four FGDs were conducted in both two districts whereby 40 adult community members participated. For every district two focus group discussions were conducted and each FGD had a maximum number of ten participants composed of peasants and animal keepers. Sex of participants were taken into account during FGDs, in Kongwa FGDs

were conducted at Ugogoni and Hogoro villages, also Mngeta and Kibaoni villages in Kilombero district. A total of 12 key informants (veterinary and health workers) seven from Kongwa and five in Kilombero participated in in-depth interviews

3.5 Sampling technique

Multistage random sampling was used to select study subjects in the community.

Step 1: A purposive sampling method was used whereby Dodoma and Morogoro regions were chosen. This was because the regions had high number of Rift Valley Fever cases following 2007 outbreak, more than 150 cases and 50 cases were reported in Dodoma and Morogoro regions respectively (Sindato *et al* 2011).

Step 2: A list of six (6) districts from Dodoma region and five (5) districts from Morogoro were obtained and one district (1) was selected randomly from each region, in which Kongwa and Kilombero were selected.

Step 3: A sampling frame of three (3) divisions from Kongwa and five (5) divisions from Kilombero were listed and two divisions were selected randomly from each district. Zoissa and Kongwa divisions; Ifakara and Mungeta divisions were selected to represent Kongwa and Kilombero districts respectively

Step 4: All wards in each selected division were obtained stratified into rural and urban settings; one (1) was selected randomly from rural and urban area, hence making two wards from each division. A total of four wards were selected from each district

Step 5: A sampling frame of all villages from rural and urban wards were obtained and written on piece of paper then three (3) villages were drawn randomly by simple random sampling method.

Step 6: From each randomly selected village, a list of hamlets were obtained and names were written on paper with total number of households. Half number (50%) of available hamlets was randomly selected and households summed up.

Step 7: A total of thirty nine (39) households were selected systematically from selected hamlets with Total number of households N, K^{th} =n/N was determined by

number of households in selected hamlets. A head of household was obtained for interview; a total of 238 and 225 community members were drawn from Kongwa and Kilombero districts.

3.6 Pre testing

A total of twenty five (25) subjects were involved in pre testing before the commencement of data collection, pre testing of household questionnaire was conducted at Disunyara village, Kilangalanga ward in Mlandizi Township Authority to check questions validity and to gauge how the questions were understood by different individuals. Socio-demographic and knowledge section of the questionnaires were modified on the basis of the result of the pre test

3.7 Data collection techniques

3.7.1 Quantitative component

Face to face interviews were conducted to collect information from head of households. Prior to interview the informed consent was obtained from study participants. After the consent, trained Research assistant or researcher sat in private environment of the household and carried out interview. Structured questionnaire was used collect demographic characteristics, knowledge, attitudes and practices responses from individual participant; an interview lasted between 30 and 45 minutes depending on fast ability to respond posed questions.

3.7.2 Qualitative component

Focused group discussions were used to collect data from community members who did not take part in face to face interview, village chairpersons or village executive officers assisted the researcher to identify peasantry and animal husbandry households then participants recruited randomly. FGDs were conducted to explore individual's attitudes, perception, knowledge and practices. A total of 40 adult participants both peasants and animal keepers, male and female aged 18+ years were involved in focus group discussions. Four FGDs were conducted instead of six planned (because there was no new information being generated); each focus group discussion had a maximum number of 10 participants. Before the discussion the

moderator introduced to participants, explained the purpose of the study and sought informed consents from participants. Participants were informed about tape recorder and permission to be recorded was obtained as the researcher could not be faster enough to put all words in writings. The sessions were conducted in or near village offices. Maximum time of FGDs lasted between 45 and 90 minutes. FGD guide with questions addressing risk perception, attitudes, practices related to RVF guided the discussion.

In depth interview was used to collect information from health and veterinary professionals. This was carried out among key informants from health and veterinary departments (district medical/health officers and in charge of health facilities in study areas also district veterinary/agricultural officers and extension officers were involved) who conveniently selected with the base of directly dealing with animals or human. Furthermore they have the authorities of reporting any event of suspected outbreak in their settings. Appointments were sought from key informants before the date of interview and interview sessions were audio recorded after obtaining permission form study participants and interviews lasted for an average of 45 minutes.

3.8 Data collection instruments

3.8.1 Quantitative component

Structured questionnaire with closed questions translated into Swahili language was used to collect data The questionnaire was divided into five (5) sub sections aimed at capturing demographic characteristics of respondents (age, sex, education level, marital status, religion and occupation), knowledge (transmission, symptoms and prevention), attitudes, perception and practices. Knowledge section comprised 30 questions, attitudes 7 questions, perception 9 questions and practice section9 questions. The questionnaire was administered by the researcher assisted by four trained research assistants.

3.9 Data management, processing and analysis

3.9.1 Quantitative component

Before data collection, four (4) research assistants were recruited and trained for one day on the purpose of the study, methods of data collection and how to fill the questionnaires. Training was carried out by investigator to ensure quality field operation. The researcher and research assistants conducted pre testing of questionnaire before actual data collection to have common understanding of the instrument. During field operation, at the end of each day of data collection all questionnaires were handled over and reviewed by principal investigator to ensure that all variables are correctly filled. After the exercise of data collection raw data from household questionnaire was entered into the computer by the investigator cleaned and analysed using SPPS version 17.

Knowledge measurement

Knowledge scale was used in measuring knowledge, whereby each item was scored 1 for correct response and 0 for incorrect response then scores were added. There were 30 items in this part based on vector and symptoms in animal, transmission and symptoms in human and preventive measures. Score varied from 0 – 30 points and a cut off points was based on mean knowledge score and classified as:

High knowledge	(75-100%)	24-30 scores
Moderate knowledge	(50-74%)	15-23 scores
Low knowledge	(< 50%)	0-14 scores

Attitudes measurement

Attitudes were measured using a five point Likert scale system. There were 7 statements regarding rift valley risk perception, perceived severity, consequences and preparedness which were positively and negatively worded. The rating scale was measured as follows:

Type of statement Strongly agree		Agree	Not sure	Disagree	Strongly disagre
Positive	5	4	3	2	1
Negative	1	2	3	4	5

The score varied from 7 to 35 points, individual responses were summed up for total attitude score. The mean attitudes score was calculated and attitudes classified as Positive and Negative:

Positive attitudes 19-35 scores

Negative attitudes 7-18 scores

Perceived risk measurement

Perceived risk was measured in category of high, low and no risk. Eight (8) statements were provided and coded as 1 for no risk, 2 low risk and 3 for high risk. Individual answers were added for total risk score and risk score was calculated and classified as risk and no risk.

Statistical Package of Social Sciences (SPSS) software, version 17 was used in analysis. Frequency tables of demographic characteristics, knowledge, attitudes and practices were tabulated. *Chi* square test and 95% Confidence interval was applied to test relationship between RVF awareness, attitudes and perceived risk V/s socio demographic variables to measure association. In this analysis a p-value of less than 0.05 was considered to be statistical significant.

3.9.2 Qualitative component

Data collected from FGDs through tape recording and note taking was transcribed in full text, coded and analysed according to themes using INVIVO8. All tapes were stored safely in such that was only accessed by investigators and planned to be destroyed 24 months after the study.

3.10 Ethical issues

Participation for this study was voluntary, written informed consent was obtained from each individual participant before the commencement of face to face interview or focus group discussion, in circumstance that participant was illiterate a tick(✓)consent was sought. The study was cleared by Muhimbili University of Health and Allied Sciences Institution Review Board and permission to conduct the study was sought from Kongwa and Kilombero districts authorities.

3.11 Limitation, validity and reliability of the study

Triangulation of methods of data collection both quantitative and qualitative enriches the quality of data findings; on the other hand pre testing of questionnaire before the actual data collection was purposely done to check validity of questions and modified to improve the accuracy or quality of data. The study was conducted only in districts that experienced RVF outbreak and was carried out four years after the outbreak. The results may not be generalized to districts which didn't experience the epidemic; also recall time was too long and might introduce recall bias. However, most of participants could remember most issues that happened during 2007 RVF outbreak due to scale of its impacts.

CHAPTER FOUR

4.0 RESULTS

4.1 Quantitative results

Table 1 shows socio demographic characteristics of study participants. All 463 community members accepted to participate in the study from Kongwa and Kilombero districts, of these 238 (51.4%) and 225 (48.6%) were living in Kongwa and Kilombero districts respectively. Their mean (SD) age was 39.8 (14.4) years ranging from 18 to 87 years and female constituted 238 (51.4%) of all respondents. Majority of respondents 148 (32.0%) were in age group between 30 and 39 years of age. Peasantry was the major occupation activity 404 (87.3%) followed by animal keeping 27 (5.8%). Majority 419 (90.5%) were Christians, 286 (61.8%) had completed primary education and 366 (79.0%) were married.

Table 1: Socio-demographic characteristics of study participants in study areas by sex (N=463)

Variable	Sex		Total
	Male N=225	Female N=238	N=463
District			
Kongwa	114 (50.7)	124 (52.1)	238 (51.4)
Kilombero	111 (49.3)	114 (47.9)	225 (48.6)
Education level			
Illiterate	63 (28.0)	87 (36.6)	150 (32.4)
Primary completed	145 (64.4)	141 (59.2)	286 (61.8)
Secondary +	17 (7.6)	10 (4.2)	27 (5.8)
Marital status			
Married	199 (88.4)	167 (70.2)	366 (79.0)
Single	21 (9.3)	22 (9.2)	43 (9.3)
Divorced	4 (1.8)	25 (10.5)	29 (6.3)
Widow	1 (0.4)	24 (10.1)	25 (5.4)
Age group (years)			
18-29	48 (21.3)	69 (29.0)	117 (25.3)
30-39	65 (28.9)	83 (34.9)	148 (32.0)
40-49	50 (22.2)	41 (17.2)	91 (19.7)
50-59	21(9.3)	26(10.9)	47(10.2)
60+	41 (18.2)	19 (8.0)	60 (13.0)
Occupation			
Petty trader	7 (3.1)	16 (6.7)	23 (5.0)
Peasants	194 (86.2)	210 (88.2)	404 (87.3)
Animal keeper	19 (8.4)	8 (3.4)	27 (5.8)
Employed	5 (2.2)	4 (1.7)	9 (1.9)
Religion			
Islam	19 (8.4)	18 (7.6)	37 (8.0)
Christianity	202 (89.8)	217 (91.2)	419 (90.5)

Out of 463 participants, 133 (28.7%) of the study respondents were involved in animal keeping (cattle, goats and sheep) which is among of the risk activities for contracting Rift valley fever (RVF). Of the study respondents, 452 (97.6%) they had heard about Rift valley fever disease.

Table 2 shows sources of information of RVF among study respondents. Most commonly reported sources were radio 320 (70.8%), friends 91 (20.1%), community meeting 65 (14.4%) and health/veterinary workers 36 (8.0%). About (65.4%) of Kongwa respondents had heard through radio compared to (76.7%) of Kilombero ($p<0.008$). On the other hand, proportions reported community meeting, veterinary/health personnel and health campaign were high in Kongwa relative to Kilombero district.

Table 2: Sources of information on Rift valley fever reported by study respondents

Source of information	**Total N=452**	**Kongwa N=237**	**Kilombero N=215**	**P value**
Radio	320 (70.8)	155 (65.4)	165 (76.7)	0.008
Friends	91 (20.1)	44 (18.6)	47 (21.9)	0.383
Community meetings	65 (14.4)	51 (21.6)	14 (6.5)	0.000
Veterinary/health personnel	36 (8.0)	31 (13.1)	5 (2.3)	0.000
Newspaper	19 (4.2)	10 (4.2)	9 (4.2)	1.000
TV	15 (3.3)	6 (2.5)	9 (4.2)	0.313
Health campaign	13 (2.9)	11 (4.6)	2 (0.9)	0.018

Note: Values in table are number (percent)

Table 3 shows proportion of who ever heard of RVF by respondents' characteristics. Male had higher proportions of those who heard the disease than female and there was statistically significant relationship between sex of respondents and hearing the Rift Valley Fever disease ($p<0.041$). On the other hand, proportions of study participants who were involved in animal keeping had heard the Rift valley fever disease was higher than those who were not involved in animal keeping ($p<0.033$). Other demographic characteristics were not statistically significant.

Table 3: Proportions of who ever heard of RVF by study respondent's characteristics

Characteristics	Total (N)	Number (%)	P-value
Overall	463	452 (97.5)	N/A
Animal keeping			
Yes	133	133 (100)	0.033
No	330	319 (96.7)	
Sex			
Male	225	223 (99.1)	0.041
Female	238	229 (96.2)	
Age group (Years)			
18-29	117	111 (94.9)	0.198
30-39	148	145 (98.0)	
40-49	91	90 (98.9)	
50-59	47	46 (97.6)	
60+	60	60 (100)	
Occupation			
Petty trader	16	16 (100)	0.801
Peasant	404	393 (97.3)	
Animal keeper	27	27 (100)	
Employed	16	16 (100)	

Community's knowledge regarding RVF

RVF vectors and symptoms in animal

Table 4 shows knowledge regarding the vectors transmitting RVF disease in animals. Almost 369(81.6%) of 452 who heard the disease were unable to identify any vector responsible for spreading the disease. Few 40 (8.8%) mentioned mosquito and 6.6% reported tsetse fly. False vectors such as houseflies and ticks were also reported by study respondents. Slightly higher (82.7%) proportions of respondents from Kongwa didn't know any vector responsible for RVF relative to (80.5%) of Kilombero district ($p<0.546$)

However, on correct vector (10.2%) of respondents in Kilombero knew the role of tsetse fly in RVF transmission compared to (2.5%) in Kongwa ($p<0.001$), while mosquito was reported by (10.1%) in Kongwa compared to (7.4%) in Kilombero but was not statistically significant ($p<0.312$)

Table 4: Knowledge regarding vector spreading RVF by districts (N=452)

Variable	**Total N=452**	**Kongwa N=237**	**Kilombero N=215**	**P value**
Mosquito	40 (8.8)	24 (10.1)	16 (7.4)	0.312
Housefly	7 (1.5)	0 (0.0)	7 (3.3)	0.005
Tsetse fly	28 (6.2)	6 (2.5)	22 (10.2)	0.001
Tick	4 (0.9)	4 (1.7)	0 (0.0)	0.055
I don't know	369 (81.6)	196 (82.7)	173 (80.5)	0.546

Note: Values in table are number (percent)

Table 5 shows knowledge about signs and symptoms of RVF in animals by districts. When respondents asked about symptoms of rift valley fever in animal, 298 (65.9%) didn't know any symptom however, few of them were familiar about typical symptoms. Sixteen percent, 73 (16.2 %) mentioned sudden death, 7 (1.5%) abortion and 5 (1.1 %) high deaths of lambs. Higher (75.8%) proportion of those who didn't know any symptoms were respondents of Kilombero district compared to (57%) of Kongwa ($p< 0.000$). Sudden deaths was highly (21.9%) reported in Kongwa compared to (9.8%) in Kilombero district ($p<0.000$). About (2.5%) of respondents in Kongwa were aware that abortion in pregnant animals was the typical RVF symptoms compared to (0.5%) of respondents in Kilombero, however was not statistically significant

Table 5: Knowledge about symptoms of RVF in animals by districts (n=452)

Variable	Total N=452	Kongwa N=237	Kilombero N=215	P value
Abortion in preg animals	7 (1.5)	6 (2.5)	1 (0.5)	0.085
High young animal mortality	5 (1.1)	5 (2.1)	0 (0.0)	0.033
Wasting	39 (8.6)	26 (11.0)	13 (6.0)	0.059
Sudden death	73 (16.3)	52 (21.9)	21 (9.8)	0.000
Diarrhoea	9 (2.0)	5 (2.1)	4 (1.9)	0.880
I don't know	298 (65.9)	135 (57.0)	163 (75.8)	0.000

Note: Values in table are number (percent)

Transmission in humans

Table 6 shows mode of RVF transmission in human. In this study, community members were familiar with some modes of contracting RVF disease in such a way that, 330 (73.7%) and 126 (27.9%) knew consuming meat of sick or dead animal and milk respectively may lead to RVF infection. Correct responses decreased to other form of exposures like contact with infected blood (4.0%), mosquito bite (1.3%) and (0.4%) touching aborted foetus. Assisting animal birth was not reported at all; also incorrect mode of transmission such as person to person route was reported by 12 (2.7%) of respondents. High (32.9%) proportions of respondents who knew that consuming milk of sick/infected animal can lead to RVF infection were living in Kongwa relative to (22.3%) of Kilombero district ($p<0.012$). Proportions of respondents who knew about consuming dead animal or meat from sick animals in both districts were almost similar (74%). Other risk factors showed slightly differences but were not statistically significant

Table 6: Knowledge about transmission of RVF in human by districts (n=452)

Variable	Total N=452	Kongwa N=237	Kilombero N=215	P value
Mosquito bite	6 (1.3)	3 (1.3)	3 (1.4)	0.927
Person to person	12 (2.7)	8 (3.4)	4 (1.9)	0.325
Consuming dead or sick animal	330 (73.7)	171 (73.4)	159 (74.0)	0.885
Consuming milk of sick animal	126 (27.9)	78 (32.9)	48 (22.3)	0.012
Touching aborted foetus	2 (0.4)	2 (0.8)	0 (0.0)	0.189
Contact with Infected animal blood	18 (4.0)	11 (4.6)	7 (3.3)	0.480
Assisting animal birth	0 (0.0)	0 (0.0)	0 (0.0)	.
I don't know	109 (24.1)	54 (22.8)	55 (25.6)	0.487

Note: Values in table are number (percent)

Symptoms in humans

Table 7 shows knowledge about symptoms of RVF in human by districts among community members. Awareness of RVF symptoms in human is important as may accelerate early health seeking behaviour which may reduce complications during outbreak. In this study, majority of community members 318 (70.4%) were unable to mention any RVF symptom in human. Only 70 (15.5%) reported haemorrhage, 41 (9.1%) fever, 7 (1.5%) headache, 3 (0.7%) muscle or joint pain respectively. Pain behind the eye (blurred vision) was not reported at all. Higher (76.3%) proportions of respondents who didn't know any symptom of RVF in human were living in Kilombero compared to (65.0%) respondents of Kongwa district ($p<0.009$). Haemorrhage which is among the complicationsof the disease was reported by (18.6%) of respondents in Kongwa compared to (12.1%) in Kilombero district, but was not statistically significant ($p<0.057$). There were slight differences in proportions of febrile symptoms in both districts, which were not statistically significant

Table 7: Knowledge about symptoms of RVF in human by districts (n=452)

Variable	Total N=452	Kongwa N=237	Kilombero N=215	P value
Headache	7 (1.5)	4 (1.7)	3 (1.4)	0.797
Fever	41 (9.1)	24 (10.1)	17 (7.9)	0.416
Muscle/joint pain	3 (0.7)	2 (0.8)	1 (0.5)	0.693
Wasting	7 (1.5)	3 (1.3)	4 (1.9)	0.610
Blurred vision	0 (0.0)	0 (0.0)	0 (0.0)	.
Jaundice	3 (0.7)	1 (0.4)	2 (0.9)	0.505
Haemorrhage	70 (15.5)	44 (18.6)	26 (12.1)	0.057
I don't know	318 (70.4)	154 (65.0)	164 (76.3)	0.009

Note: Values in table are number (percent)

Preventive measures

Table 8 shows knowledge of preventive measures regarding rift valley fever disease. When community members asked in what ways human can be prevented from contracting RVF, more than half 245 (54.2%) reported avoid eating dead animals or meat from sick animals, 148 (32%) thorough boiling of milk and 149 (33%) thorough cooking of meat. Responses declined to other available preventive measures such as avoid contact with infected animal (6.0%), use of protective gear (2.2%) and reduce human –animal contact (2.4%). High (39.7%) proportions of respondents knew that thorough boiling of milk reduce chance of contracting the disease compared to (25.1%) of Kilombero district ($p<0.001$). furthermore thorough cooking of meat was reported by (40.5%) of Kongwa respondents relative to (24.7%) of Kilombero ($p<0.000$). Proportions of respondents who reported avoid eating dead animal or meat of sick animals was slightly higher in Kilombero (56.3%) compared to (52.3%) in Kongwa but were not statistically significant

Table 8: Knowledge of preventive measures regarding RVF among respondents (N=452)

Variable	Total (N=452)	Kongwa N=237	Kilombero N=215	P value
Thorough boiling milk	148 (32)	94 (39.7)	54 (25.1)	0.001
Thorough cooking meat	149 (33)	96 (40.5)	53 (24.7)	0.000
Avoid eating dead carcasses	245 (54.2)	124 (52.3)	121 (56.3)	0.394
Use of protective gear	10 (2.2)	7 (1.4)	3 (3.0)	0.243
Reduce contact with animals	11 (2.4)	4 (1.7)	7 (3.3)	0.273
Use mosquito repellents	3 (0.7)	2 (0.8)	1 (0.5)	0.693
Avoid contact with infected animals	27 (6.0)	15 (6.3)	12 (5.6)	0.754

Note: Values in table are number (percent)

Overall knowledge of RVF

The mean knowledge score of the sample population was found to be 3.1 ± 2.6 (mini- max 0-15) corresponding to an average of 3 correct responses out of 30 items which was quite low. Almost all respondents (99.8%) had low level of knowledge, only one (0.2%) had moderate knowledge and none of the respondents had high knowledge level, based on cut off point of knowledge score in this study. Thus statistical association of knowledge score could not be established visa demographic characteristics. Only specific knowledge about preventive measures was found to be statistically significant with age (middle age 30-50 years) and district of residence, (X^2=9.89, p=0.042) and Kongwa (X^2=5.91, p=0.015) respectively.

Attitudes regarding RVF

Table 9 shows distribution of attitudes towards RVF among community members in Kongwa and Kilombero districts. Participants responded to seven (7) statements which had a total score of 35. There were 434 (96%) of respondents who had positive attitudes and 18(4.0%) had negative attitudes based of attitudes cut-offs point. The mean (SD) attitude score of all respondents was 24.9 (3.70) (minimum-maximum, 15-35).

Table 9: Distribution of attitudes towards RVF among community member in Kongwa and Kilombero districts, Tanzania, 2011

Attitude level		N (n=452)	Percentage
Positive		434	96.0
Negative		18	4.0
Total		452	100
Mean =24.9	SD =3.70	Min =15	Max =35

Table 10 shows percentage of the respondents by attitudes towards Rift Valley Fever in each individual statement. Majority of community members (90.3%) had positive attitudes that RVF is a serious disease, of which (67.3%) strongly agreed and 23% agreed. Majority of participants strongly agreed (68.8%) and agreed (21.2%) that rift valley fever is a threat to public health as well as economy of the community. About (63.2%) of respondents thought they were at risk of Rift Valley Fever infection. Of these (33.8%) strongly agreed and (29.4%) agreed

Less than half (39.7%) of community members believed that RVF disease was curable. However, only (16.3%) of respondents felt that rift valley fever is not curable (10.8%) strongly disagree and (5.5%) disagree and about (44%) were not sure whether was curable or not. Most of the community members (83.6%) appreciated that during the outbreak disease could affect all the people in the community not only the pastoralist (57.5%) strongly disagreed and (26.1%) disagreed. When asked if it was possible to prevent animal - human transmission,

more than half (67.5%) agreed if veterinary and health practices are to be followed, of which, (35.2%) strongly agreed and (32.3%) agreed.

More than half (56.0%) of community members showed negative attitudes towards health facility preparedness in events of RVF emergency, of which (31%) were not in position to comment and (25%) disagreed with the statement. Fewer than half (44%) felt that the health facilities were well equipped to handle an outbreak.

Table 10: Proportions of attitudes towards Rift valley fever among respondents of Kongwa and Kilombero districts for each statement (N=452)

Statement	**Strongly agree**	**Agree**	**Not sure**	**Disagree**	**Strongly disagree**
RVF is a serious disease	63.7	23.0	8.2	1.5	0
RVF is a threat to public and animal health	68.8	21.2	9.1	0.9	0
You are at risk of getting RVF	33.8	29.4	17	10.6	9.1
RVF is curable	16.4	23	43.8	5.5	10.8
RVF affect only pastoralist	4.4	2.9	9.1	26.1	57.5
Preventability from animal to human	35.2	32.3	20.6	5.8	6.2
Health facilities prepared to handle RVF outbreak	24.3	19.7	31.0	6.0	19.0

Table 11 shows percentage of participants who agreed with each attitude statement towards RVF by districts. About 408 (90.3%) of respondents felt RVF is a serious and threatening disease and more than half 286 (62.8%) agreed to be at risk of the disease. Furthermore 305 (67.5%) of respondents agreed that that there are ways in which the disease can be prevented from animals to humans.

Less than half 180 (39.4%) and 199 (44%) agreed that the diseases is curable and health facilities are well prepared to handle an event of RVF if occur respectively.

Table 11: Percentage of respondents who agreed with each attitude statement by district (N=452)

Statement	Total	Kongwa	Kilombero	P value
	N=452	N=237	N=215	
RVF is a serious disease	408 (90.3)	206 (86.9)	202 (94.0)	0.011
You are at risk of getting the RVF	286 (62.8)	142 (59.9)	144 (67.0)	0.118
RVF is a curable disease	180 (39.4)	100 (42.2)	80 (37.2)	0.278
RVF affect only pastoralist	33 (7.3)	18 (7.6)	15 (7.0)	0.807
Preventability from animal to human	305 (67.5)	151 (63.7)	154 (71.7)	0.070
Health facility preparedness	199 (44.0)	90 (46.0)	109 (41.8)	0.369
RVF is a threatening disease	407 (90.0)	211 (89.0)	196 (91.2)	0.435

Perceived risk of RVF infection

Figure1 shows perceptions of risk of RVF among study respondents in Kongwa and Kilombero districts. Perceived risk of infection through consuming dead carcass was assigned high risk by almost all respondents (96.2%) followed by consuming raw or unpasteurized milk (93.4%). Risk rating of other modes of transmission showed high proportions also. Incorrect risk perception was observed concerning person to person transmission. More than half (63.9%) of respondents said caring for RVF patient bore high risk while (21.2%) reported that caring for person infected by RVF bore no risk.

More than half (51%) perceived veterinary procedures bore high risk, while low proportion (34.7%) mentioned that the activity bore no risk. About, (60%) of respondents said mosquito bite bore high risk and (34.5%) bore no risk of RVF. Regarding animal slaughtering and skinning, more than two third (69%) of respondent said it bore high risk and (20.6%) bore no risk. Furthermore sharing of shelters with animal perceived to be a high risk practice by majority (80%) of

respondents. Actually respondents reported that this was not only a potentially risk practice for contracting RVF but also other animal related diseases.

Figure 1: Percentage of perceived risk of Rift Valley Fever infection among respondents in Kongwa and Kilombero districts, (N=452)

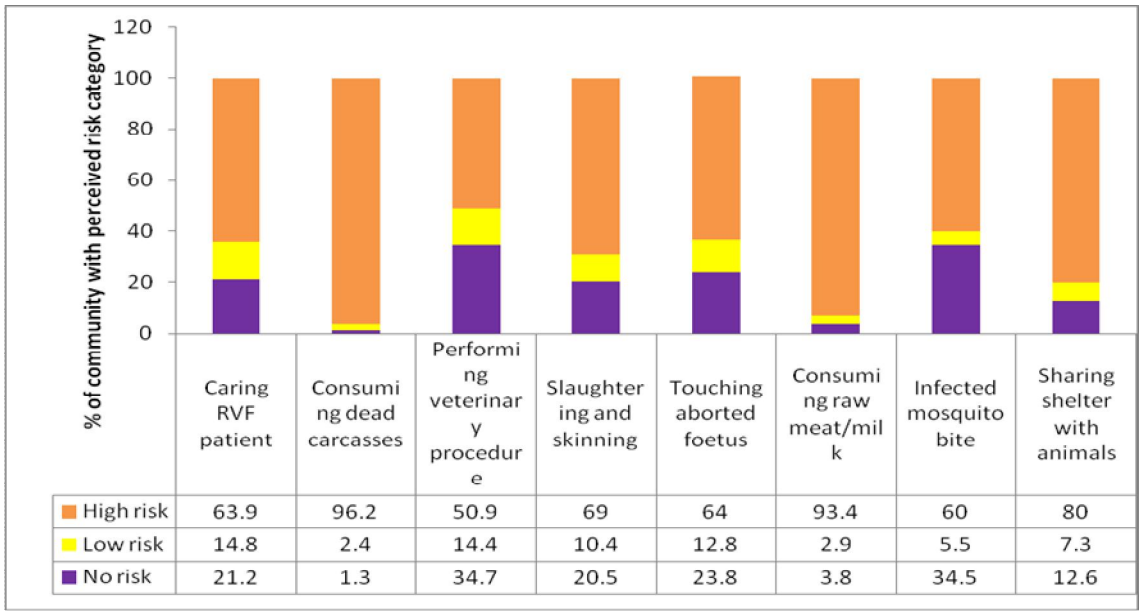

Table 12 shows distribution of perceived risk of Rift valley fever among study respondents by district. Perceived risk of rift valley fever infection varied greatly when mode of transmission in human was specified. The mean (SD) risk score was 20.3 (3.9) min-max, 8-24, about 422 (93.4%) of community members assigned risk to at least one of eight statement.

Table 12: Distribution of perceived high risk of RVF among community by districts

Statement	Kongwa	Kilombero	Total
	N=237	N=215	N=452
Caring RVF patient	181 (76.8)	108 (50.2)	289 (63.9)
Consuming dead/sick animal	227 (95.8)	208 (96.7)	435 (96.2)
Performing vet procedures	137 (57.8)	93 (43.3)	230 (50.9)
Slaughtering and skinning	175 (73.8)	137 (63.7)	312 (69.0)
Touching aborted foetus	161 (67.9)	129 (60.0)	290 (64.2)
Consuming raw meat/milk	226 (95.4)	196 (91.2)	422 (93.4)
Infected mosquito bite	144 (60.8)	127 (59.1)	271 (60.0)
Sharing shelter with animals	194 (81.9)	168 (78.1)	362 (80.1)

Table 13 shows relationship between perceived risk and demographic variables. *Chi* square test (X^2) was used to assess the difference risk rating by demographic characteristics. No statistical significant difference was observed by education level, sex, age and district of residence of respondents.

Proportion of respondents with perceived risk was higher in male (94.6%) than in females (92.1%). surprisingly respondents who had no primary school had higher proportions of perceived risk (96.6%) than other groups; this might be pastoralist who mostly lack formal education. Respondents from age group of 30 – 39 years and 60+ years had lower proportions of perceived risk than 18 – 29 years. No significant difference was observed between age groups. Respondents of Kongwa district had higher (94.9) of perceived risk than those in Kilombero district (91.6)

Table 13: Proportion of community members perceived high risk regarding RVF transmission.

Characteristics	Total (N)	Number (%)	P-value
Education level			
Illiterate	147	142 (96.6)	0.12
Primary completed	279	257 (92.1)	
Secondary+	26	23 (88.5)	
Sex			
Male	223	211 (94.6)	0.290
Female	229	211 (92.1)	
Age group (Years)			
18-29	117	111 (95.5)	0.72
30-39	148	145 (91.7)	
40-49	91	90 (93.3)	
50-59	47	46 (95.7)	
60+	60	60 (91.7)	
District			
Kongwa	237	225 (94.9)	0.158
Kilombero	215	197 (91.6)	

Practices regarding RVF

Table 14 shows practices regarding RVF among study respondents. Practices were assessed based on health seeking behaviour of community members and how they deal with animals in their natural settings.

In this study, it was found that majority of the respondents 337 (74.6%) preferred to go for care in health facility in the early experience of febrile illness such as fever, headache and muscle or joint pain. One hundred and ten (24.3%) went for care in medical shops/drug stores and 5 (1.1%) preferred to go for care to traditional healers.

As far as what the community do with dead animals, 202 (45%) of respondents were disposing/ burying, 131 (29%) informed the veterinary officers in their setting and interestingly 70 (15.5%) were skinning and eating dead animal meat.

When asked how they handled dead animals, 180 (39.8%) reported the used bare hands, nearly a quarter 110 (24.3%) used protective gears and 81 (18.0%) used local means such as tighten and pulling, use of hoes and trees/sticks. While 81 (17.9%) pointed out that they had never handled dead animals.

Among animal keepers, when respondents asked what action they took in animal abortion events and deaths of young animals, majority 74 (55.6%) preferred to inform veterinary officers, 34 (25.6%) did nothing and 21 (15.8%) consulted agro veterinary shops. About (88.2%) of respondents in Kongwa reported to visit health facility in febrile illnesses compared to (59.5%) of Kilombero ($p<0.000$). However, (39.5%) of respondents in Kilombero preferred drug shops/outlets (10.5%) and was statistically significant ($p<0.000$).

In Kongwa, (22.4%) of respondents were consuming dead animal meat compared to (7.4%) of Kilombero district. Good practice of burying dead animal was reported by (65.6%) of Kilombero respondent relative to (25.7%) of Kongwa ($p<0.000$). The proportion of respondents who used bare hands and protective gears in handling sick animals in both Kongwa and Kilombero districts was not statistically significant ($p<0.914$) and ($p<0.621$) respectively.

Table 14: Proportion of respondents regarding RVF practices in Kongwa and Kilombero district

Variable	**Total N=452**	**Kongwa N=237**	**Kilombero N=215**	**P value**
Early stage of febrile illness				
Visit health facility	337(74.5)	209(88.2)	128(59.5)	0.000
Visit drug shop/store	110 (24.3)	25(10.5)	85(39.5)	0.000
Visit traditional healer	5 (1.1)	3(1.3)	2(1.0)	0.766
What you do with dead animal?				
Skinning and eating	70 (15.5)	53(22.4)	17(7.9)	0.000
Burying	202 (44.7)	61(25.7)	141(65.6)	0.000
Informing vet. Officer	131(29.0)	96(40.5)	35(16.3)	0.000
Leave it	49 (10.8)	27(11.4)	22(10.2)	0.682
How do you handle dead animal				
Use protective gear	110 (24.3)	60(25.3)	50(23.3)	0.621
Use bare hands	180 (39.8)	95(40.1)	85(39.6)	0.914
Never handled	81 (17.9)	48(20.3)	33(15.3)	0.166
Others*	81 (18.0)	34(14.4)	47(21.8)	0.040
Experiencing animal abortion n=133		**106**	**27**	
Inform vet officer	74 (55.6)	63(59.4)	11(40.8)	0.082
Do nothing	34 (25.6)	27(25.5)	7(25.9)	0.966
Visit agro shop	21 (15.8)	12(11.3)	9(33.3)	0.005
Inform VEO	4 (3.0)	4(3.8)	0(0.0)	0.307

4.2 Qualitative results

A total of four (4) focus group discussions, two from each district and twelve (12) in-depth interviews were conducted among community members, veterinary and health professionals respectively. FGDs were conducted at Ugogoni and Hogoro villages in Kongwa also Kibaoni, and Mngeta village in Kilombero district.

4.2.1 Awareness of RFV

Disease of eating meat

Respondents openly discussed a wide range of issues about the Rift valley fever. In this study, majority of participants had heard RVF disease and they associated it with consuming meat. Many participants in FDGs they didn't understand its cause, clinical signs and symptoms in both animals and humans.

...."It is a disease caused by eating meat, like what we heard from media we have to reduce eating meat and take vegetables" (FGD1 male, Kongwa)

..Aaah!! The one contracting the Rift valley fever disease is the one taken meat from sick animal" (FGD2 female, Kongwa)

In in-depth interviews with key informants (veterinary and health professionals) knew that RVF is primarily a zoonotic disease which also affect humans. They had adequate knowledge regarding nature of the disease and causative agent of rift valley fever. Climatic change particulary unusually heavy rain fall was associated with rift valley fever outbreaks. In interviews conducted, participants narrated;-

"The way I understand as veterinary officer, RVF naturally it came from or it is normally present along the rift valley lakes, and it normally affects ruminants animals like cows, goats and sheep and it is very dangerous as it can easily affect human beings in case he/she has eaten meat of affected animal" (IDI vet, Kongwa)

……."Aaaa, the way I understand is the disease which naturally affects animals but at the same time and in some ways it can affect human beings" (*IDI, vet,Kongwa)*

Another one alleged this…..

……*"Mmhhhh, the RFV is a disease which is caused by viruses and it mostly attack and affects animals like cow, goats, sheep and even human beings can get this disease" (IDI vet, Kongwa)*

Heavy rainfall

Climate change particularly the season of unusual heavy rainfall was associated with Rift valley outbreaks

"What I can say is the availability of rain…this disease is much associated with rain season, when there is heavy rain then we always expect the rift valley fever outbreak. So it is associated with heavy rains and I don't really know the connection but what I know is when there is rain it is very likely to have this disease outbreak" (IDI planning, Kongwa)

Clinical signs and symptoms of RVF.

RVF symptoms in animals act as alarming indicator and call upon immediate response. In this study, it was found that most of the community members were not aware with the clinical features of RVF, participants explained:

"The sign of RVF in animals, is shivering and high grade fever also often runny nose" (FGD3 male, Kilombero)

"What we have heard is that, a person who can get this kind of fever is the one who normally eat meat of an animal died of the disease, so when he/she takes that meat is going to get infected, but regarding the clinical features I don't know(FGD3 male, Kilombero)

Frequency abortion and deaths of young animals was cited as potential indicator of suspected RVF outbreak by key informants

."The outbreak can be recognized and confirmed when you find out that animals especially cows or goats abort frequently and die in large numbers without specific cause but even human beings who will die after eating the animals meat" (IDI vet, Kongwa)

…*"When the animal dies, the animal gets stiffness of the muscles throughout the body, also the eyes becomes protruded and the other sign which is very important in RFV is the inability of the blood to clot..The animal will be discharging blood which is very difficult to clot" (IDI vet, Kongwa*)

Difficult to diagnosis in human

Health professionals particularly clinician pointed out some difficulties in diagnosis/ detection of RVF in human as the disease resemble to other febrile illnesses during early stages. Thoroughly history taking from patients is the way towards differential diagnosis

"For the case of human beings, there is high grade fever of unknown origin, that is to say, you can treat as malaria or any other condition that has got fever as a symptom but there will be no improvement, but when you take good history you will eventually discover the use of meat from a dead ruminant animal, so I think that is it, but sometimes you can find that high fever together with diarrhoea" (*IDI health, Kongwa*)

Risk factors of RVF

Regarding the mode of contracting the disease in human, this study revealed that majority of community members were unable to mention other exposures leading to RVF infection.

Consuming dead animals

Behaviour pertaining eating dead carcasses in these communities was highlighted.

Some peasants in group discussions reported that since they did not own animals it is sometimes hard to be sure about the safety of meat sold to them by pastoralists:

....."We are peasants, if I have no "mboga" and pastoralist bring meat, I must buy however I will not understand whether the animal was sick or suffered from what kind of disease" (FGD3 male, Kilombero)

Veterinary officers thought this practice could probably explain the spread of RVF to humans during previous outbreak:-

"If the outbreak occurs today there is also danger of spread of this disease because of the habit of most people around here, the habit of eating meat regardless of its quality or safety. Most people have the habit of eating meat from animal which have died of unknown reasons" (IDI vet, Kongwa)

"Yaah it is like that, because other people in some of the communities they do not normally care if the animal has been prepared for meal or died because of certain disease, and they don't even care whether or not the meat has been inspected. So this kind of culture may cause RVF outbreak in large places" (IDI vet, Kongwa)

4.2.2 Attitudes towards RVF

Attitudes influence seeking behaviour and efforts towards prevention and control of health problem. Participants discussed openly this subject matter and pointed out that rift valley fever has no boarder as it affects both animal keepers and peasants:

Some of the study participants had these to say:

.."We are not living in isolated community, we are mixing with pastoralist, we are getting milk and meat from them even without knowing whether the animal is sick, thus the disease affects all of us" (FGD4 female, Kilombero)

We are farming in areas where pastoralists do exist; they have limited education, in case of disease outbreak they can cause others to be infected. You can see their children sleeping in the same house with calves (FGD 3 male, Kilombero)

Controlling the disease

Prevention and control of the disease was highlighted as a role of everyone in the community as narrated by participants:

"This is the responsibility of both livestock keepers and other community members, and above all it is the responsibility of every person who knows this disease to educate others, so in short it is the responsibility of the whole society" (IDI vet, Kongwa)

…*"First of all it is the responsibility of us, community members and veterinary officers to raise awareness of this disease to the livestock keeper. The awareness should focus on the signs and symptoms of this disease; this will help early detection and destroy of the suspected cases"* (*IDI health, Kongwa)*

Preparedness of health facility in tackling RVF was doubted,

…*"For now to be honest we don't have enough equipment for either investigating or detecting the disease, so we almost always use the clinical signs which may sometimes be wrong" (IDI health, Kongwa)*

4.2.3 Emergency preparedness

Strategies for identification of RVF

Regarding the issue of whether or not the community members are aware of the existing strategies for identification of RFV, most of the participants appeared to be unaware of any strategy in place which is used to identify the presence or probability of occurrence of this disease, hence perceived there were no any strategies which are operating at the moment

…*"In short we don't have any strategy in our district kilombero" (FGD3 male, Kilombero)*

Likewise the responses were similar to veterinary and health professionals:

…….*"Yeah to tell the truth, we cannot say that we are having instruments which can detect the possibility of having an outbreak in the next couple of months or years or we cannot say we have existing strategies to do that"(IDI vet, Kongwa)*

…. *"In this district we do not have any'' (IDI vet, Kongwa)*

RVF preparedness Strategies

In this aspect of existing strategies of preventing Rift valley fever, participants mentioned the presence of ward and village veterinary officers as the only existing strategies which have been implemented so far.

……..*"Along all the boundaries of our districts we have placed people called veterinary officers, mostly in wards and villages whose work is to bring any information regarding the outbreak as soon as it starts, so we have trained them of the signs and symptoms of the rift valley fever" – (IDI Planning, Kongwa)*

Some had even confusing ideas on the prevention strategies available towards rift valley fever

"We have introduced departments which deal with the so called neglected tropical diseases, so it has been one of our strategies to prevent the outbreak of this kind of disease. In short the department does not specifically deal with RVF but all other disease which occurs rarely but is very dangerous. So far the departments' main task is to provide education about these diseases to the veterinary officer and community members in general" (IDI Health, Kongwa)

Some participants showed concern that, most of the preventive interventions are not provided until the time of emergencies. It was mentioned vaccination of cattle as one of the preventive strategy available however community readiness during calm period doubted and seemed strategies to be null.

A participant said:

……*"In short I can say that we Tanzanians we normally wait until the outbreak or any problem occurs then we start taking precautions, I can tell you if right now we don't vaccinate our cattle without any reason but if the disease start today you will find people coming here to vaccinate animals, but the way I understand vaccines are for prevention and not cure….so it will just be like that, so we don't have any strategy in place" (IDI vet, Kongwa)*

Recommendable ways of preventing and control RVF

Another important question was what interventions do you suggest should be done targeting prevention and control? Many participants gave ways to prevent and some went even far by describing ways which can be used to prevent the spread of the disease once it has occurred. Participants mentioned the issue of giving health education to the community, the issue of vaccinating cattle and more research to be done so that we can predict the occurrence of the outbreak.

...."My opinion to the government regarding this disease is to continue giving education without being tired just like they way they are doing with HIV and malaria, they should have banners and media people should help the government so that more people can get to know everything about this disease. We can also have special programs in the radio stations which addresses this disease" (FGD 3 female, Kilombero)

……. "The most important thing is routine vaccination of the cattle and if possible human beings so that we can prevent this disease" (IDI planning, Kongwa)

Research was also mentioned in this aspect, a participant said:

"What I think is the best way to prevent this disease is for the veterinary professionals to do more research on the cycle of this disease to the extent that we can easily predict its occurrence and hence enable the preparatory measures before the outbreak. Also they can study more on the signs and symptoms which will help the community members to easily identify and deal with this disease" (IDI Vet, Kongwa &Kilombero)

CHAPTER FIVE

5.0 Discussion

This study aimed to assess knowledge, attitudes and practices regarding Rift Valley Fever among community members, veterinary and health professionals in Kongwa and Kilombero districts Tanzania. Combination of quantitative and qualitative of methods was used to enhance validity and reliability of findings. In this study it found (99.8%) of all community members had low level of knowledge regarding vector, transmission and symptoms of the disease in spite of the fact that (97.5%) had heard RVF. This finding is reflected in qualitative part whereby majority of community members could not explain how the disease is being transmitted in animals and vectors responsible for it. The result compare well with what has been reported from study viral haemorrhagic fever (VHF-Ebola) conducted in Gabon where more than (50%) had low knowledge, of which (68%) had heard the disease (Kunii *et al* 2001). This could be possibly that people do not absorb all information they get and tend to forget information after sometimes or might be education messages delivery was not sufficient to address people's understanding of RVF risk factors, transmission and prevention.

In analysis of overall knowledge with demographic characteristics (such as age, sex, district of residence, education and marital status) no association was found. This could be limited with the fact that majority of respondents had low knowledge and none had higher knowledge, again could be coupled also with recall bias. On specific knowledge, this study only found that age (30 to 50 years) and Kongwa had significant association with knowledge of prevention. This might be because, majority of respondent were remembered more on avoiding consuming meat, milk and thorough boiling of meat

Transmission and symptoms in animal

The results of this study revealed that most of the community members (81.6%) were not aware of any vectors transmitting RVF in animals. Only few (9%) and (6.2%) were able to mention mosquito and other blood sucking vectors including tsetse fly respectively. A similar finding was reported in qualitative part of this study where

participants were unaware about route of transmission in animals. This is consistent with survey conducted in Sudan (El-Rehima et al 2011), whereby almost 70% incorrectly reported tick and spread through (33.1%) labour, (26.7%) air, (11.1) water, (11.1%) don't know and (4.4%) insect. This could be attributed by recall bias, as participants tend to forget information in a long due course without updates. Poor knowledge regarding correct vectors has important implication in the spread of disease in animals and this limited awareness about routes of transmission could predispose the humans into contracting the disease as the infected vectors can transmit the disease into human. Regular awareness interventions about the disease transmission in animals need to be addressed to communities

Abortion in pregnant animal and high deaths of lambs are early warning typical symptoms of RVF in animals, abortion reach 100% in sheep, nearly 100% mortality in lambs and fatality range between 5-40% in different species of old ruminant animals (Davies 2003). In this study more than half (65.9%) of respondents were not aware of any of symptoms in animals. Only few (1.5%) knew about these alarming symptoms. The similar findings revealed from qualitative part of this study whereby awareness of RVF symptoms in animals among community adults was little. However veterinary and health professionals found conversant regarding animal symptoms as could be taught in academic carrier. These results have important implication on the spread of the disease to human as people had little understanding of the alarming signs thus, interventions deemed necessary to bridge the knowledge gap among community members.

Transmission and symptoms in humans

Human activities and behaviours such as animal husbandry, slaughtering and skinning, performing veterinary procedures (assisting animal birth and autopsy) and consuming animal products particularly raw meat or milk, dead carcasses and products from sick animals have been documented as route (risk factors) for RVF infection in human (Anyangu *et al* 2009). It has been also reported that bite of infected mosquito most commonly *Aedes* sp transmit RVF disease (WHO 2010).

The results of this study show that nearly three quarter (73.7%) of community members knew RVF is contracted through consuming animal products particularly meat of dead animals or milk of sick animals and (24.1%) didn't know how RVF is contracted. Only fewer (4.0%) were able to identify other exposures/risk factors such as contact with infected blood, touching aborted foetus and assisting animal birth. Increased awareness of using animal products has been also reflected in qualitative part of this study. The findings in this study were contrary to findings from a study done in Gezira which indicated that (28%) knew consuming meat and (17.0%) didn't know (El Imam *et al* 2009). This was probably due to the educational messages conveyed during the outbreak which insisted on avoiding consuming meat and products from sick animals.

Currently there is no evidence of person to person transmission of RVF infection (WHO 2010); it was interestingly found that (2.7 %) of respondents reported the disease to be transmitted through this route contrary to (60%) what have been reported previously study in Maldives (N. Ahmed, unpubl). All respondents (100%) were not aware that assisting animal birth could lead to RVF infection. The lack of awareness about other routes of RVF increases the probability of infection during outbreak. The ability to understand the spectrum of risk factors for RVF infection is important towards prevention measures. This is an important area need to be emphasized more during program intervention.

In the current study, majority (70.4%) of the respondents were not able to correctly identify any symptoms of RVF in humans except few (16.0%) and (9.1%) who identified haemorrhage and fever respectively. This also was supported with FGDs findings from qualitative part of the study. This is contrary to previous studies of Dengue fever in Pakistan (Syed *et al* 2010), Jamaica (Shuaib *et al* 2010) and Laos (Nalongsack *et al* 2009) where more than (70%) knew fever, (41%) headache, (35.1%) bleeding and (32.5%) joint/muscle pain. This could be because there is no sustainable educational program to address RVF since it occurs as outbreak. Poor knowledge on the spectrum of symptoms of RVF in human may be confused with other febrile illness like malaria. This may have implications on delay in seeking medical attention until complications arise

Preventive measures

Findings show that knowledge about prevention was well articulated to some factors. More than half of respondents knew avoiding consuming meat of dead/sick animals and one third thorough cooking of meat and boiling of milk. These were also reported in qualitative part with community members. Nearly (3.0%) reported other measures such as use of protective gear and reduce animal human contact Veterinarians knew wide range of prevention strategies and additionally pointed out vaccination of cattle. Limited knowledge about preventive measures may prolong individual to be exposed to RVF infection during outbreak. Therefore there is a need for additional educational program to address these preventive measures.

Attitudes toward RVF

The results of this study show that nearly three quarter (71.1%) of respondents had positive attitudes towards RVF disease. The mean attitude score was 24.9 ± 3.70 SD from 35 score. About 90% of respondents felt that RVF is a serious disease with socio-economic impact on its occurrence. This was contrary to a community's knowledge study done in Gabon regarding Ebola VHF, only (25%) felt was fatal and threat (Kunii et al 2001). These thoughts and feelings could be attributed by losses experienced or witnessed on deaths of animals or relatives/spouse among community members during outbreak. This provides a good opportunity of self initiatives towards preventing RVF in the presence of correct knowledge. It is important to increase their awareness through health educational messages intervention.

This study revealed that (63.2%) of respondents thought they were at risk and they appreciated that on its occurrence, all community is at risk of contracting the disease if proper measures were not followed. This was similarly found in qualitative part of the study which pointed out behaviours pertaining use of unsafe meat (uninspected or dead carcasses). Some had incorrect attitudes towards RVF, about (36.8%) felt that were not at risk at all. This could potentially cause participants passive and not take preventive measures. This highlights the need of strengthening regular educational messages towards behavioural change regarding RVF and using inspected meat

A good number of respondents (56.0%) felt that health facilities were ill prepared to handle a potential RVF outbreak and nearly (31%) of them were not sure. In particular, few felt most of the health facilities were not well equipped in term of personnel and equipments. Qualitative results revealed that health workers need good history taking for differentiating RVF from other common febrile illnesses which is not always done. This was a similar finding in the done in Sudan, only (2%) considered history of the disease for suspicion of zoonosis (El-Rahima *et al* 2011)

In the recent study, attitudes towards preventing and controlling the disease were found positive among all respondents (veterinary, health workers and community members). They felt was the role of everyone in the community. This finding corresponds to previous findings in Laos indicated that was a role of both government and community (Nalongsack *et al* 2009). This underscores the need for strengthening collaboration in managing RVF by involving community members, veterinary and health workers at different levels in order to improve early detection and managing spread of RVF during outbreaks. Need for multidisciplinary collaboration and engaging community members has also been a subject previously addressed by other researchers (Fyumagwa *et al* 2011).

Practice regarding RVF

Cultural and beliefs are determinant factor of health seeking behaviour regarding disease causes and treatability. In most of developing world particularly Africa, commonly people start treatment at home and health facilities sought if no response (Makundi et al 2006) Self treatment and use of traditional medicine are pattern behaviour among the population of Tanzania (Tarimo et al 2000). In this study about three quarter (75%) of respondents preferred to visit a health facility in early symptoms of fever, muscle/joint pain and headache. Studies done in Jamaica (Shuaib *et al* 2010) and Laos (Nalongsack *et a*l 2009) reported almost similar results 98% and 63.5% visited health facilities respectively. This could be because of the symptoms are similar to malaria which drugs are subsidized and available. About one quarter (25.0%) had preferred drug shop and traditional healer. Advocacy is needed to change people's health seeking behaviour from self medication to early diagnosis in order to reduce complications that could be associated with delayed diagnosis.

This study point out that, some (15.5%) of respondent were skinning and consuming dead animals which creates high risk of contracting not only RVF but also other zoonotic diseases. Similarly, this has been shown in various studies in Kenya (Anyangu *et al* 2009) and Sudan (El Imam *et al* 2009). This could possibly be of cultural and beliefs existing within these communities. Health educations towards behavioural change need to be addressed among community members in both districts.

Results from this study revealed nearly half (44.4%) of animal keepers were not consulting veterinary officer about incidents of abortion and death of young animals, of which (25.6%) did nothing. This finding was inconsistent with study done in Sudan reported (35.5%) of livestock owners consulted veterinarians (El Rehima *et al* 2011). This possibly could be because of extension services available to them. Future interventions efforts should target this community as well for early detection and notification of RVF emergency in animals.

In this study, almost 40% of respondents used bear hands during handling dead animals, 18.0% used local means such as tighten and pulling, use of hoes and sticks/trees which may not be protective enough. Such practices could continue to expose individuals and animal-human contact in unprotected way persist. This may be accounted by either cost implication of protective gears or regular unavailability in their local settings. Interventions tailored to address RVF should also emphasize the use of protective gears among community and veterinary workers.

Besides most of respondents 457 (98.7%) were interested to know more about the disease particularly on transmission route and symptoms in both animals and human, cause and source. They opined that educational intervention should be carried out regularly even in absence of epidemic

Study participants from all districts reported that there was no tool or strategy which could be used to predict the occurrence of RVF. Community members were not aware and couldn’t link the abortion of pregnant animals and high death of young animals as alarming signs of RVF. Health and veterinary knew about available vaccine as prevention strategy in animal and increasing number of veterinary officer

at all levels was cited as another important strategy of early identification of RVF in animals. These findings provide opportunity of developing or adopting RVF prediction model, increasing and strengthening capacity of available veterinary officers and educate community members to be able to link the alarming signs in animals for early detection and notifications.

Findings of this study are discussed with acknowledged limitations. First, participants in this survey were selected only from districts experienced the RVF outbreak, thus findings have limited generalizability to other areas of Tanzania which may have higher or lower level of knowledge. Second, data were obtained using cross sectional study, which assesses relationship in one point in time and does not take account of temporal relationship. Third, the survey used interviewer structured questionnaire in quantitative approach, this may have influenced reporting bias when interviewer rephrased questions. Besides the survey was carried out almost four years after the last RVF outbreak, this is a long time to recall interventions regarding the disease, hence could have introduced recall bias

5.1 Conclusion & Recommendations

Despite of limitations, this study provides baseline information regarding RVF knowledge gaps among study groups. From and overall look, it is evident that majority of community members have very low level of knowledge about modes of transmission and symptoms in both animal and human with respect to veterinary and health professionals.

Community felt positively about RVF as a serious and threatening disease which require multidisciplinary approach towards its prevention and control in spite of low knowledge they had. Furthermore most of respondents had high risk perception regarding RVF infection in human even for incorrect routes.

Alternative health seeking behaviour among community members in early stages of febrile illness, risk practices of consuming dead animals, use of bear hand in handling dead animals were observed in this study and hence, call upon health actions. Furthermore, neither the districts nor community had RVF prediction and emergency preparedness activities.

5.2 Recommendations

- Health planners should design RVF awareness interventions to raise community's knowledge particularly focused on transmissions and symptoms of RVF and conveyed regularly through available media in both Kongwa and Kilombero districts regardless of epidemics.

- Strengthening community capacities in early recognition, detection and notification of RVF before an outbreak and providing educational messages towards behavioural change of eating dead carcasses.

- RVF prediction tool /strategies including Surveillance of zoonotic diseases need to be developed and used at districts levels to forecast RVF in different area

- Strengthening capacity of health workers in diagnosis of zoonotic diseases for early outbreak detection in communities

- ❖ The findings from this study could be used as a tool to develop and implement interventions in Kongwa and Kilombero districts.
- ❖ With availability of resources, additional studies (KAP & Seroprevalence) should be extended to nomadic and abattoir workers

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6.1 Appendices

5.1.1 Informed Consent Form (English version)

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES - DIRECTORATE OF RESEARCH & PUBLICATIONS.

ID-NO: ...../......./.....

Consent to participate in this study

Greetings!! My name is …..... from Muhimbili University of Health and Allied Sciences, Dar es Salaam. At the moment, we are carrying out a study to determine knowledge, attitudes and practices regarding rift valley fever among community members living in Kilombero and Kongwa districts.

Purpose of the study

This study aims to collect information on knowledge, attitudes and practices regarding rift valley fever among community members living in Kilombero and Kongwa districts. You are being asked to participate in this study as a community member from this district and would be grateful if you are willing to participate by answering questions from this study.

What Participation Involves

If you agree to participate in this study the following will occur:

1. You will sit with a trained interviewer and will be required to answer questions that have been prepared for the study through interview in order to obtain the intended information to inform design and implement collaborative prevention and control of rift valley fever. The interviewer will be recording your responses in the questionnaire.
2. No identifying information such as name will be collected from you during this interview, except your age, level of education, marital status and your current occupation.
3. You will be interviewed only once for approximately 30 minutes in a private setting.

Confidentiality

I assure you that all the information collected from you will be kept confidential. Only people working in this research study will have access to the information. We will ensure that any information included in our report does not identify you as a respondent as we will not put your name or other identifying information on the records of the information you provide.

Risks

You will be asked questions about your personal particulars and understanding regarding rift valley fever. Some questions could potentially make you feel uncomfortable. You may refuse to answer any particular question and may stop the interview at anytime.

Rights to Withdraw and Alternatives

Your participation in this study is completely voluntary. If you choose not to participate in the study or if you decide to stop participating in the study you will not get any harm. You can stop participating in this study at any time, even if you have already given your consent. Refusal to participate or withdrawal from the study will not involve loss of any benefits to which you are otherwise entitled.

Benefits

The information you provide us is extremely important and valuable. It will help to increase our understanding on level of knowledge, attitudes and practices regarding rift valley fever among community members living in Kilombero and Kongwa districts. Also the information will help to design preventive interventions and strategies. There is no direct benefit however; individual benefit will be obtained through intervention programmes which can be conducted in this particular area

In case of injury

We are not anticipated that any harm will occur as a result of your participation in this study

Compensation

There will be no compensation of time spent during the interview or focused group discussion; however your participation is highly appreciated

Who to contact

If you have questions about this study, please don't hesitate to contact:

SASITA. S. SHABANI, The **Principal Investigator** Muhimbili University of Health and Allied Sciences (MUHAS), P.O. Box 65001, Dar es Salaam (Tel. no. 0717-925140 or0787-909056).

Prof M. Aboud, Chairman of Senate Research and Publications P. O. Box 65001, Dar es Salaam. Tel: 2150302-6

DR. MANGI J. EZEKIEL, The supervisor of this study.

Signature

Do you agree to participate and answer questions in this study?

Participant Agrees [__]

Participant Disagree [__]

I _____ have read/understood the contents in this form. My questions have been answered. I agree to participate in this study.

Signature of Participant

_____

Signature of witness (if participant cannot read)

_____

Signature of research assistant

_____

Date of signed consent

_____

6.1.2 Informed Consent Form (Swahili version)

CHUO KIKUU CHA SAYANSI ZA AFYA MUHIMBILI –KURUGENZI YA UTAFITI NA MACHAPISHO.

Namba ya Utambulisho .... /...../.....

Ridhaa ya kushiriki katika utafiti huu

Habari! Jina langu naitwa ..…….... natoka Chuo Kikuu cha Sayansi za Afya Muhimbili, Dar es salaam. Tunafanya utafiti kuangalia ufahamu, mitizamo na mazoea dhidi ya ugonjwa wa homa ya bonde la ufa miongoni mwa jamii inayoishi katika wilaya ya Kilombero na Kongwa, Tanzania.

Malengo ya utafiti

Utafiti huu una lengo la kukusanya taarifa ya awali dhidi ya ufahamu, mitizamo na mazoea miongoni mwa jamii ya wakazi wanaoishi katika wilaya ya Kilombero na Kongwa.Unaombwa kushiriki katika utafiti huu ukiwa miongoni mwa jamii inayokaa katika wilaya hii.

Ushiriki unahusisha nini?

Ukikubali kushiriki katika utafiti huu yafuatayo yatatokea:

1. Utakaa na msaili/mtafiti aliyepewa mafunzo ya jinsi ya kuhoji na kujibu maswali yahusuyo ufahamu wako kuhusiana na ugonjwa homa ya bonde la ufa. Msaili atakua ananukuu majibu yako katika dodoso.
2. Hakuna taarifa zozote za utambulisho tutakazokusanya wakati wa usaili isipokua umri, kiwango cha elimu, hali yako ya ndoa na kazi yako kwa sasa.
3. Utahojiwa mara moja tu kwa takriban dakika 30 kwenye sehemu ya faragha.

Usiri

Nakuhakikishia kwamba taarifa zote zitakazokusanywa kutoka kwako zitakua ni siri, ni watu wanaofanya kazi katika utafiti huu tu ndio wanaweza kuziona taarifa hizi. Tutahakikisha ya kwamba taarifa zilizojumuishwa katika ripoti yetu hazitakuwa

zinatoa utambulisho wako. Hatutaweka jina lako au taarifa yoyote ya utambulisho kwenye kumbukumbu za taarifa utakazotupatia.

Madhara

Utaulizwa maswali juu ya ufahamu, mitizamo na mazoea yako kuhusu ugonjwa wa homa ya bonde la ufa. Baadhi ya maswali yanaweza kukufanya usijiskie vizuri hivyo unaweza kukataa kujibu swali lolote na unaweza kusimamisha usaili wakati wowote

Haki ya kujitoa na mbadala wowote

Ushiriki wako katika utafiti huu ni wa hiari, kama utachagua kutokushiriki au utaamua kusimamisha ushiriki wako hutapata madhara yoyote. Unaweza kusimamisha kushiriki katika tafiti hii muda wowote hata kama ulisharidhia kushiriki. Kukataa kushiiriki au kujitoa katika utafiti hakukufanyi upoteze stahili yoyote unayotakiwa kupata.

Faida

Taarifa utakayotupatia ni muhimu sana na yenye thamani kwa kuwa itasaidia kuongeza uelewa wetu kuhusu ufahamu, mitizamo na vitendo kuhusu ugonjwa wa homa ya bonde la ufa miongoni mwa jamii ya wakazi wa wilaya hii. Pia taarifa utakayoyupatia itasaidia kuandaa mipango na mikakati ya kuzuia mlipuko mwingine. Hakutakuwa na faida ya moja kwa moja kutokana na ushiriki wako katika tafiti hii, ila faida binafsi itapatikana kupitia mipango itakayoendeshwa baadae katika maeneo yenu.

Endepo utaumia

Hatutegemi madhara yoyote kutokea kwa kushiriki kwako katika tafiti hii.

Fidia ya muda

Hakutakuwa na fidia ya muda uliotumika wakati wa kufanya mahojiano au majadiliano katika utafiti huu, ijapokuwa kuwa ushiriki wako katika tafiti hii utashukuriwa na kuthaminiwa

Watu wa kuwasiliana nao

Kama una maswaIi katika utafiti huu usisite kuwasiliana na:

SASITA. S. SHABANI, Mratibu mkuu wa mradi, Chuo Kikuu Cha Afya Muhimbili, S.L. P 65001, Dar es Salaam (Simu. no. 0717-925140 au 0787-909056).

Prof M. Aboud, Mwenyekiti wa kamati ya chuo ya utafiti na machapisho, S.L.P 65001, Dar es Salaam. (Simu namba: 2150302-6) na

DR. MANGI J. EZEKIEL, Msimamizi wa utafiti huu.

Sahihi

Unakubali kushiriki na kujibu maswali ya tafiti hii?

Mshiriki amekubali [__]

Mshiriki amekataa [__]

Mimi _____ nimesoma/nimeielewa hii fomu, maswali yangu yamejibiwa. Nakubali kushiriki katika utafiti huu.

Sahihi ya mshiriki

_____

Sahihi ya shahidi (kama hawezi kusoma na kuandika)

_____

Sahihi ya mtafiti msaidizi

_____

Tarehe ya makubaliano

_____

6.1.3 HOUSEHOLD QUESTIONNAIRE

KNOWLEDGE, ATTITUDE AND PRACTICES TOWARDS RIFT VALLEY FEVER SURVEY QUESTIONNAIRE

QCODE	QUESTION	RESPONSE& CODING
O0	Questionnaire ID No	[.....]
O1	Name of Household head	.....
O2	Name of Interviewer	.....
O3	Date of Interview	...../...../.....

Demographic characteristics

QCODE	QUESTION	RESPONSE&CODING
A1	District name	Kilombero .....1 Kongwa 2
A2	Ward name	.....
A3	Village name	.....
A4	Sex	Male.....1 Female.....2
A5	How old are you	[Years.....]
A6	Relationship with h/hold head	Head.....1 Wife.....2 Child.....3 Sister.....4 Others 5
A7	Marital status	Married.....1 Single .....2 Divorced .....3 Cohabiting .....4 Widow 5
A8	What is your educational level?	Illiterate.....1 Primary not completed.....2 Primary completed.....3 Secondary.....4 Diploma, degree.....5 Madrasa.....6
A9	What is your occupation?	Trader.....1 Peasant.....2 Animal keeper.....3 Employed .....4*..... Others specify.....5
A10	What is your religion?	Islam .....1 Christianity 2

		Pagan 3

4* Employed (put specific occupation)

Knowledge

QCODE	QUESTION	RESPONSE&CODING		
B1	What are common health problem in this community?	....		
B2	What are common animal diseases in this community?	....		
B3	Are you involved in animal keeping?	Yes .....1 No .....2 go B7		
B4	If yes, have you experienced events of abortion and death of young animals?		Yes	No
		Abortions in anima.....	1	2
		Young animal deaths.....	1	2
B5	For year 2011, how many events did you experience?	Abortion in animals..... Young animal deaths.....		
B6	What do you do when experiencing abortion and deaths of young animals? **DO NOT READ**	Inform veterinary officer.....1 Inform VEO/WEO.....2 Inform health worker.....3 Inform other animal keepers.....4 I do nothing.....5 Others specify.....6		
B7	Have you ever heard about Rift Valley Fever disease?	Yes .....1 No 2		
B8	Where did you hear the RVF disease? **DO NOT READ**		Yes	No
		a. Radio.....	1	2
		b. News paper.....	1	2
		c. TV programmes.....	1	2
		d. Friends.....	1	2
		e. Health campaign.....	1	2
		f. Training.....	1	2

		g. Brochure.....	1	2
		h. Village meetings.....	1	2
		i. Veterinary and health workers.....	1	2
		j. Other specify.....	1	2
B9	What was the last time did you hear?	One month ago.....1 Three months ago.....2 Between 6- 9 months.....3 More than 1 year.....4 I don't remember.....5		

Knowledge on transmission, symptoms and prevention of RVF

QCODE	**QUESTION**	**RESPONSE&CODING**		
B10	Which vector responsible of transmitting RVF in animals? **DO NOT READ**		Yes	No
		a. Mosquito.....	1	2
		b. Housefly.....	1	2
		c. Tsetse fly.....	1	2
		d. Tick.....	1	2
		e. I don't know.....	1	2
B11	What are common symptoms of RVF in animals? **DO NOT READ**		Yes	No
		a. Abortion of preg animals.....	1	2
		b. High deaths of young animals.....	1	2
		c. Wasting.....	1	2
		d. Sudden deaths.....	1	2
		e. Diarrhoea.....	1	2
		f. I don't know.....	1	2
		g. Other specify.....	1	2

B12	In what ways human contract RVF disease? **DO NOT READ**		Yes	No
		a. Infected mosquito bite.....	1	2
		b. Person to person route.....	1	2
		c. Consuming meat of dead/sick animal.....	1	2
		d. Consuming milk of sick/infected animal.....	1	2
		e. Touching aborted foetus.....	1	2
		f. Touching blood of infected animal or slaughtering.....	1	2
		g. Assisting birth of infected animal.....	1	2
		h. I don't know.....	1	2
		i. Other specify.....	1	2
B13	What are common symptoms of RVF in human? **DO NOT READ**		Yes	No
		a. Headache.....	1	2
		b. Fever.....	1	2
		c. Muscle/joint pain.....	1	2
		d. Wasting.....	1	2
		e. Blurred vision.....	1	2
		f. Jaundice.....	1	2
		g. Haemorrhage.....	1	2
		h. I don't know.....	1	2
		i. Other specify.....	1	2

B14	What are available preventive measures? **DO NOT READ**		Yes	No
		a. Thorough boiling milk.....	1	2
		b. Thorough cooking of meat.....	1	2
		c. Avoid consuming meat of dead/sick animal.....	1	2
		d. Use of protective gears during slaughtering or skinning.....	1	2
		e. Reduce mosquito contact.....	1	2
		f. Avoid touching aborted foetus.....	1	2
		g. Reduce animal-human contact.....	1	2
		h. I don't know.....	1	2
		i. Other specify.....	1	2

Attitudes: [Am going to read several statements regarding RVF, please rate the degree which you are agree or disagree with each]

QCODE	STATEMENT	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
C1	Rift valley fever a serious disease	1	2	3	4	5
C2	Rift valley fever is a threat to the socio-economic wellbeing of this community	1	2	3	4	5
C3	You are considering yourself to be at the risk of contracting the disease?	1	2	3	4	5
C4	RVF is curable disease	1	2	3	4	5
C5	RVF is the disease of pastoralist	1	2	3	4	5
C6	It is possible to prevent spread of RVF from animals to humans	1	2	3	4	5
C7	Health facilities are equipped enough to handle RVF outbreaks	1	2	3	4	5

Perceived risk of infection [READ OUT][Am going to read several statements regarding RVF transmission in human, please rate the degree of risk you perceive for each statement]

QCODE	QUESTION	RESPONSES& CODING
D1	Be closer or caring RVF patient	No risk.....1 Low risk.....2 High risk.....3
D2	Consuming products from sick or dead animal	No risk.....1 Low risk.....2 High risk.....3
D3	Performing veterinary procedure	No risk.....1 Low risk.....2 High risk.....3
D4	Slaughtering and skinning animals	No risk.....1 Low risk.....2 High risk.....3
D5	Touching aborted animal foetus	No risk.....1 Low risk.....2 High risk.....3
D6	Consuming raw meat or milk	No risk.....1 Low risk.....2 High risk.....3
D7	Bite of mosquitoes	No risk.....1 Low risk.....2 High risk.....3

D8	Sleep in the house with animals	No risk.....1 Low risk.....2 High risk.....3

Practices regarding RVF

Who responded NO in B3, should be asked from E5-E9
Who responded YES in B3, should be asked from E1-E9

QCODE	QUESTION	RESPONSE&CODING
E1	Is there veterinary officer in your ward?	Yes .....1 No .....2 -----> nenda E3 I don't know .....3 -----> nenda E3
E2	If yes, does s/he visit you regularly?	Yes .....1 No 2
E3	If no, where do you get veterinary services?	I do for myself.....1 From private vet. officer.....2 From agro vet shops.....3
E4	Where do you get various information about animal diseases	.....
E5	What do you do with dead animals?	Skinning .....1 Burying .....2 Inform vet officer.....3 Leave it .....4 Other specify.....5

E6	How do you handle a dead animal suspected for disease?	Use protective gear.....1 Use bear hands.....2 Use sticks/trees.....3 Never handled.....4 Other specify.....5		
E7	What you do in first stage of fever, muscle/ joint pain, double vision and headache?	Go to pharmacy .....1 Go to health facility.....2 Go to traditional healer.....3		
E8	Which symptoms can urgently lead you to seek medical attention?		Yes	No
		a. Haemorrhage.....	1	2
		.	1	2
		b. Fever.....	1	2
		c. Jaundice.....	1	2
		d. Blurred vision.....	1	2
		e. I don't know.....	1	2

		f. Other specify.....		
E9	What are preventive measures do you undertake to avoid contracting RVF?		Yes	No
		a. Thorough boiling milk and cooking meat.....	1	2
		b. Avoid eating dead carsasses.....	1	2
		c. Separating animal- human shelter.....	1	2
		d. Using protective gear in animal.....	1	2
		e. Avoid touching aborted foetus.....	1	2
		f. I don't know.....	1	2
		g. Other specify.....	1	2

Additional information

F1	Are you interested to know more about RVF?	Yes .....1 No 2
F2	If yes, what part would you like to know about?	**.....**

6.1.4 In depth Interview Guide for Health and veterinary Workers and other district leader

Introduction component	**<u>Consent to participate in this study:</u>** My name is.....from Muhimbili University of Health and Allied Sciences, Dar es salaam. I would like to talk to you about Rift valley fever. At the moment we are carrying out a study to determine knowledge, attitudes and practices among community members, health and veterinary professionals. **<u>The purpose of the study</u>**: The purpose is to establish baseline information to inform design and interventions that can help to prevent future rift valley fever outbreaks. **<u>Participation:</u>**

	You will sit with trained interviewer and asked questions about knowledge, attitudes and practices regarding RVF. Your responses will be recorded in the questionnaire. Interview will take 45 minutes and I will be taping the session because I can't write fast enough to get it all down. **Confidentiality:** All responses given will be kept confidential and will only be shared with research team members. We will ensure that any information included in our report does not identify you as a respondent. **Rights to withdraw and alternatives:** Your participation in this study is completely voluntary, you may choose to participate or not, if you decide to stop participating will not get any harm. You have not to talk anything you don't want and you may end the interview at any time **Risks:** You will be asked questions about your understanding regarding RVF. Some questions could make you feel uncomfortable, you may refuse to answer and stop the interview **Benefits:** Information you provide us is very important and valuable to inform design and intervention to prevent future RVF outbreaks.there is no direct benefits however, individual benefits will be obtained through intervention that will be implemented in this community. **Compensation:** There will be no compensation of time spent during the in depth interview, however, your participation is highly appreciated. Are there any questions about what I have just explained? Are you willing to participate in this interview? Y/N _____ _____ ...../...../..... Interviewee signature date

	Place of interview _____ 1. ID Number...../...../..... 2. District name..... 3. Position/title..... 4. Sex of informant..... 5. Years worked in this department/area..... 6. Name of interviewer..... 7. Date of interview...../...../.....
Questions	**Knowledge** 1. What do you know about RVF? 2. How did you detect the outbreak? –Probe for symptomatic or diagnostic approach 3. What early signs/warnings do you observe in the process of identifying RVF? 4. Are you aware about any activity regarding RVF prevention in this community? If yes, what are they? **Attitudes** 5. Do you think this community is at risk of RVF? Why? 6. Who's role to prevent rift valley fever? Why? 7. Do you think this health facility is well equipped to predict and handle RVF outbreak? Why? **Response and practice** 8. How did you participate in RVF outbreak? 9. How the community involved in RVF response in this area? 10. Do you think the role of RVF control was multisectoral centred? Probe who did what? 11. Regarding the role of different actors, from the RVF outbreak experience what can you say about collaboration among actors

	12. What factors do you think were responsible for the spread of the RVF in the villages/communities (**Probe** for specific social, cultural, economic, geographic factors that might explain the spread in the district. 13. As a health/veterinary worker, what efforts are you making towards the prevention of RVF in this community? elaborate **Intervention and emergency preparedness** 14. What strategies, interventions towards rift valley fever are currently in place in this community? Elaborate 15. Would you assess it successful or otherwise? Why? 16. What other interventions do you think can hold more promise in preventing future RVF outbreak? Probe to mention. 17. Do you have RVF preparedness and response plan? Yes see a copy, if no how you go about in event of RVF? 18. In your opinion, do you think the disaster management team is operationalizable and effective at district level as stipulated by policy? Probe how, strength and weakness? 19. What interventions do you suggest should be done targeting prevention and control? Probe health education, vector control, case management
Closing component	Is there anything more you would like to add? Thank you for your time

6.1.5 Focus Group Discussion guide for community members aged 18+ years.

Introduction component	**<u>Consent to participate in this study:</u>** My name is.....from Muhimbili University of Health and Allied Sciences, Dar es salaam. I would like to talk to you about Rift valley fever. At the moment we are carrying out a study to determine knowledge, attitudes and practices among community members, health and veterinary professionals. **<u>The purpose of the study</u>**: The purpose is to establish baseline information to inform design and interventions that can help to prevent future rift valley fever outbreaks. **<u>Participation:</u>** You will sit with team of researchers and other

	participants as a group to discuss issues about knowledge, attitudes and practices regarding RVF. Your responses will be recorded through note taking and I will be taping the session because I can't write fast enough to get it all down. The session will last for not more than 1:30 hours **Confidentiality:** All responses given will be kept confidential and will only be shared with research team members. We will ensure that any information included in our report does not identify you as a respondent. **Rights to withdraw and alternatives:** Your participation in this study is completely voluntary, you may choose to participate or not, if you decide to stop participating will not get any harm. You have not to talk anything you don't want and you may end the interview at any time **Risks:** You will be asked to discuss the posed topic/questions about your understanding regarding RVF. Some questions could make you feel uncomfortable, you may refuse to answer and stop the discussion **Benefits:** Information you provide us is very important and valuable to inform design and intervention to prevent future RVF outbreaks. There is no direct benefit however; individual benefits will be obtained through intervention that will be implemented in this community. **Compensation:** There will be no compensation of time spent during the discussion; however, your participation is highly appreciated. Are there any questions about what I have just explained? Are you willing to participate in this discussion? Y/N Place of discussion _____ 1. ID Number...../...../..... 2. District name.....

	3. Village..... 4. Number of participants..... 5. Profile of participants..... 6. Name of facilitator..... 7. Date ...../...../.....
Questions	**Problem of the community** 1. What are the common diseases known to affect people in this community/village? 2. What is being done to address these problems **Awareness** 3. What do you know about rift valley fever? ▪ **Probe:** what is the meaning of it? ▪ What causes it? ▪ Have you ever seen a person suffering from this disease or have ever suffered from this disease? ▪ How does the person look like? ▪ What makes you know that this person is suffering from RVF and not other disease? ▪ What are the local terms used to describe RVF **Perception and practice** 4. How do people in this community perceive this disease? ▪ **Probe:** where do they go when they first see a fellow with signs of RVF?

	▪ Do you currently feel at risk of RVF ▪ How do people in this community normally live with their animals? **Emergency preparedness and intervention** 5. Is there any special system or strategy in this community that is used to identify early signs or to forecast RVF outbreak? **Probe:** ▪ What environmental triggers or signs/ symptoms in livestock used to foresee an outbreak ▪ How were you informed by the outbreak?(was there a suspect case detected? Or informed by nearby districts/localities ▪ If there is special village committee for RVF? What interventions are currently in place/ongoing in this locality as a way for preparedness for an imminent RVF outbreak?(probe who are the actors, content of intervention if any) 6. Are you aware of the existing malaria interventions activities currently implemented in this community? 7. With reference to the recent (2007) outbreak, what were/have been the effects of this disease to this community? ▪ **Probe:** what are the immediate effects? ▪ **Probe for Health effects, economic** • What are the long-term effects with reference to the recent outbreak?
Closing component	Thank you for your time