

# A QUALITATIVE INVESTIGATION OF ANIMAL-TO-HUMAN BRUCELLOSIS KNOWLEDGE AMONG HEALTH WORKERS IN KAJIADO NORTH SUB-COUNTY, KENYA

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**ABSTRACT.** Animal-to-human brucellosis transmission methods in Kajiado North Sub-County, Kenya are inadequately documented. The Sub-County's main livelihood is livestock-keeping, putting it at risk to brucellosis infections. Objective of this study was to determine the knowledge of brucellosis among animal and human health workers. These workers were stationed in Kajiado North Sub-County and were the key informants of this study from whom qualitative data was collected. The data was analysed based on emerging themes, e.g. brucellosis significance in the community, livestock birthing and milk hygiene. Results revealed that brucellosis a significant disease in the community, informants were knowledgeable on the need for pre-purchase livestock examination, the need for proper disposal of livestock abortive material and on good milk hygiene measures. However, it was found that not all had adequate knowledge about brucellosis transmission through livestock birthing. The results indicated that measures to control and prevent brucellosis transmission to man, and between animals were inadequate as health workers were unable to adequately advise the community. It is recommended that health workers should be trained on

all methods of brucellosis transmission, especially transmission during livestock births.

*Keywords:* Kenya, brucellosis, knowledge, health-worker, Kajiado,

## INTRODUCTION

Human brucellosis, a communicable zoonotic disease caused by bacteria of the genus *Brucella* is the world's most common bacterial zoonosis (Franco *et al.*, 2007). Brucellosis has great public health and economic significance. It is a neglected zoonosis that is endemic in Kenya, particularly in Kajiado County. Its endemicity in man in Kajiado County is more so due to the community's main livelihood as livestock keeping. The occurrence of brucellosis in humans is largely dependent on the animal reservoir. The burden of the disease appears to remain greatest, most under-prioritised globally amongst pastoral people (Plumb *et al.*, 2013). Brucellosis is among the seven neglected diseases termed so because of their widespread distribution and effect on multiple species. Yet, it has not been prioritised by national and international health systems (FAO, 2010). The risk factors for human brucellosis

include the consumption of raw milk and contact with livestock aborted fetuses, foetal membranes and infected neonates (Akbarmehr, 2011). Human brucellosis has a high morbidity burden, yet the affected communities have a poor understanding of the disease. Furthermore, the true burden of disease is unknown, and thus the global incidence is assumed to be 10-25 times higher than the reported figures (WHO, 1997). The global incidence is thought to be 500,000 infections/year (Franco *et al.*, 2007), while the regional incidence is >200 per 100,000 people (Holt *et al.*, 2011).

The prevalence of human and animal brucellosis in Kajiado North Sub-County, Kajiado County, Kenya is high at 14.1% and 3.4% respectively (Ogola *et al.*, 2014). The prevalence of animal brucellosis is higher in pastoralist systems at 10%, compared to zero-grazing systems at 2% (Kang'ethe *et al.*, 2000). It thus follows that human brucellosis is more common where pastoralist systems predominate, and as long as the disease persists in animals, transmission to humans continues (Kang'ethe *et al.*, 2000). There is a strong correlation between prevalence of brucellosis and the practice of moving animals from one place to another for grazing purposes. Intermingling of flocks which is common under pastoral husbandry is also a catalyst in the spread of the disease (European Union, 2001).

The objective of the study was to determine the knowledge related to human brucellosis among the local level human and animal health providers in Kajiado County, Kenya.

## MATERIALS AND METHODS

### Study Design

A historical study designed using purposive sampling was employed. Data on the knowledge related to brucellosis transmission from animals to man was collected.

### Study Setting

The study was conducted in Ewaso Kedong Ward, 1°9'0" N and 36°34'0" E (Getamap.net, 2013), in Kajiado Sub-County, Kajiado County, Kenya. Ewaso Kedong Ward is generally dry and hot with an annual rainfall of less than 700 mm (ALLPRO Report, 2007). The key economic activities in the area are a combination of livestock production (44.1%), agricultural production (29.4%) and off-farm income sources (26.4%) (NCAPD, 2005). Most of the land (92%) is non-arable; only 8% can support subsistence farming and hence livestock keeping is the predominant economic activity (KDDP, 2009). The type of livestock production system practiced is pastoralism (NEMA, 2013).

### Study participants

Kajiado North sub-county is one of the five sub-counties in Kajiado County. The sub-county was chosen due to its high prevalence of human and animal brucellosis in comparison to the other sub-counties. A second reason for choosing it was the pastoralist livelihood of the community that brings the community close to their livestock, hence putting them at risk of

brucellosis. Ewaso Kedong Ward, one of the four wards in Kajiado Sub-County was chosen as livelihoods depend more on livestock-keeping in this ward, in comparison to the other wards in the sub-county. From Kajiado Sub-County and from Ewaso Kedong Ward, qualitative data was collected adopting a technique used by Holt *et al.* (2011). The data was collected from the human health workers, and from the animal health workers. These health workers were the key informants of the study. The key informants were interviewed to provide in-depth information on the knowledge that pertains to brucellosis transmission in the Kajiado North pastoralist community. The key informants that were interviewed and their affiliation are shown in Table 1.

### Sample size

Seven key informants were included in the study. They included the local level government officers (three human health workers, three animal health workers and one public health worker).

### Study Variables

The variables sought to determine the brucellosis knowledge of the key informants regarding the prevention of transmission of brucellosis from animals to man. These included variables such as the need to boil milk before consumption or while making tea, the purpose of using protective wear while assisting in livestock delivery, methods of livestock fetal material disposal, seeking of treatment from an animal health worker (AHW) when livestock are sick and seeking of advice from an AHW before livestock purchase.

### Study Instruments

An interview guide was employed in the collection of qualitative data from the key informants, adopting a technique used by Holt *et al.* (2011).

**Table 1:** Key informants interviewed and their respective affiliations

| Key Informant | Affiliation   |
|---------------|---|
| AHA 1         | Animal Health Assistant, in Ewaso Kedong Ward, under Ministry of Livestock Development (MOLD).          |
| Nurse         | Public Health Nurse at Ewaso Kedong Dispensary, under Ministry of Public Health and Sanitation (MOPHS). |
| CHEW          | Community Health Extension Worker, at Ewaso Kedong Dispensary, under MOPHS.                             |
| AHA 2         | Animal Health Assistant, in Ewaso Kedong Ward, under MOLD.  |
| DMOH          | District Medical Officer of Health, in Kajiado Sub-County, under MOPHS                                  |
| DVO           | District Veterinary Officer, in Kajiado Sub-County, under MOLD  |
| DDPHO         | Deputy District Public Health Officer, in Kajiado Sub-County, under MOPHS                               |

## Data Analysis

The data was typed into a word processing program, that is, MSWord, and analysed based on emerging themes by classifying responses into meaningful categories.

## Study Limitation

There was no observation of the informants advising the community as they indicated that they did.

## Ethical Considerations

The study approval was sought and granted from the Institutional Research and Ethics Committee (IREC) of Moi University/Moi Teaching and Referral Hospital. In addition, informed and voluntary oral consent was sought from each informant prior to enrollment into the study. Privacy rights of the informants were respected and coded unique personal identifiers were used on the key informant guide. Confidentiality of all the information obtained was maintained.

## RESULTS

The results from the key informants were outlined based on emerging themes; significance of human brucellosis in the community, livestock purchase, etc., as below;

### Significance of human brucellosis in the community

Regarding the importance of brucellosis, most informants indicated that the disease

was important, and on average 3 - 4 cases a month were reported to the veterinary office. The livestock that were involved in brucellosis transmission were cattle, sheep and goats. Products from these livestock that is meat, milk and offals (kidneys and livers), were commonly consumed un-cooked leading to the rapid spread of the disease.

### Livestock purchase

Regarding need for pre-purchase livestock examination by an AHW, all the key informants agreed that it was necessary to obtain the animals' history, health status and origin. However, the community members rarely called upon the AHWs to conduct the examination before they purchased livestock.

### Livestock birthing

The majority of the key informants said that they advised the community members to seek an AHW, or to use protective wear when assisting in livestock deliveries, but the advice was mostly ignored including the use of 'Mboya' (plastic bags) which was also infrequent. Most community members found the use of gloves at assisting animal parturition as unnecessary, hence avoided them. They however reported that they used herbs to prevent disease transmission, or for treatment of livestock after a difficult livestock birthing case. It was further reported that owing to the challenge of transport and communication, the community members preferred to use their traditional practices in assisting birthing. Some key informants however indicated

that there was no emphasis on the use of protective wear to the community members because it was assumed that brucellosis was spread only via meat and milk.

On the designation of birthing areas, it was reported that there was minimal emphasis. The community being semi-nomadic pastoralists, the animals delivered in the pastures during the grazing, thus it was a difficult measure to implement. It was expressed that the community found the idea of livestock birthing area designation too technical, and thus ignored it, while in some cases due to the large herd sizes, the community found it difficult to identify pregnant animals. Nonetheless, there was encouragement to the community to seclude the calving dam, and in a few instances the gravid animal was separated and taken outside the cattle enclosure to a clean and dry place for delivery.

### **Livestock abortions**

Pertaining to reporting of livestock abortions to authorities, most indicated that the information was sent to the veterinary office, but it reached other health-related stakeholders when the disease rose to epidemic levels. The veterinary office indicated that they received an average of 4 – 5 reports of disease every month; however more reports were made in the rainy season. It was reported that upon receipt of the information, a farm visit was conducted to further examine the herd, to obtain laboratory samples for confirmatory diagnosis and to advice on control and prevention strategies.

On the advice given towards the management of materials from livestock abortion, a measure advocated for was the immediate deep burial of the material to prevent its unearthing by dogs or wild animals. The common practice of feeding the material to dogs was advised against. Burning of the fetal material was also mentioned as a suitable method of abortive material disposal.

### **Milk**

It was reported that the community was advised by all the key informants to boil milk always before consumption or fermentation by heating the milk until it rose to the top of the surface forming an 'umbrella' or 'parachute' formation, allowing it to cool and repeating the procedure 2-3 times. On the ideal method of making tea with milk, the key informants directed the community to either boil the milk first and then add water and boil them together, or to mix the water and milk, boil them together until it rises to the top.

### **Control and prevention of brucellosis**

It was stated that the measures currently under institution to control and prevent transmission of the disease included awareness creation in the community via regular group training sessions. In the training sessions, infectious diseases common in the community were discussed, and brucellosis was mentioned occasionally.

It was reported that other measures to control and prevent human brucellosis were wanting; such as the laboratory facilities

for confirmatory diagnosis, livestock anti-brucella vaccine, use of protective gear when handling livestock abortive material, and livestock abortive material disposal practices.

## CONCLUSION

The disease was considered to be of public health importance in the community. All key informants recommended pre-purchase livestock examination to the community, trained on proper methods of abortive livestock material management and on milk safety/hygiene practices.

However, not all of the key informants recommended protective measures at livestock birthing as well as the designation of livestock birthing areas. This is because these key informants were not all aware that these were ways in which brucellosis could be transmitted to man.

Measures to control and prevent brucellosis were wanting. Awareness creation by the key informants to the community was carried out, but it was inadequate. All other control and prevention measures such as laboratory confirmation of the disease, etc., were wanting.

The key informants, and in particular the CHEW, Nurse and AHAs should be trained on all key methods of brucellosis transmission, and in particular transmission of the disease during livestock births. In this way they will be able to holistically create awareness to the community.

Brucellosis awareness creation in the community should be improved by increasing the brucellosis training sessions, detailing the training material and expanding the area of geographical

coverage. Other control and prevention measures should be installed, such as laboratory facilities to provide diagnostic and confirmatory services.

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