



## ONE HEALTH KNOWLEDGE, ATTITUDES AND PRACTICES AMONG ABATTOIR WORKERS IN NAROK, KENYA

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### ABSTRACT

Abattoir workers play a key role in One health through food safety and public health, animal disease control and environmental health. Their increased contact with food animals and animal by-products poses One Health challenges such as contracting of zoonotic diseases such as Anthrax, Rift Valley Fever, Bovine Tuberculosis, Q-fever, Leptospirosis, Cysticercosis, Coenurosis and Brucellosis among others. These diseases have significant health implications, but their impact has been largely under-estimated due to limited information and underreporting contributed by limited knowledge level, poor attitudes and risky behaviours among abattoir workers. This study was conducted to assess knowledge levels, attitudes and practices on One-Health among abattoir workers in Narok County, Kenya. An observational and interview based cross sectional study targeting all workers in four (4) randomly selected abattoirs in Narok County, Kenya was conducted to determine their knowledge, attitude and practices on One Health. A total of Sixty abattoir workers were interviewed based on their willingness to participate in the study. Three out of the four selected abattoirs had reliable access to potable water, hand washing facilities and working toilets. Whereas environmental pollution was present in all the sampled abattoirs, severe pollution was noted in two of them. The severely polluted abattoirs had dispersed polythene papers, heavy manure build up, noisy operating environment and strong foul smell. The severe pollution was associated with presence of scavenging birds and stray dogs. Although most (81.7%; n=60) of the abattoir workers appreciated the relevance of public health risks and their significance in meat handling, only a few (11.7%) of them could explain these risks using One Health Concepts Anthrax (58.3%) and Brucellosis (35%) were the most commonly mentioned zoonotic diseases whereas other key zoonotic diseases associated with meat handling such as Cysticercosis (10%); Rift Valley Fever (6.7%), Leptospirosis (1.7%); Q fever (1.7%) were least mentioned. Some of the reported risky practices for spread of zoonotic diseases included; smoking while at work (30%); presence of body wounds (40%); eating at work (40.8%); cleaning intestines (32.7%); poor hygiene (51.02%); and lack of or poor-quality water (38.8%). Abattoir workers had limited knowledge on one health risks associated with their occupation with several risky practices such as eating or smoking while at the slaughter house and working without covering skin wounds. Most of the abattoir workers did not understand the importance of Personal Protective Equipment in Public health and safety and thus only wore them as a matter of regulation. Training of abattoir workers on One Health approaches to food handling and occupational risk management should be carried out.

**KEYWORDS :** Abattoir workers, Occupational hazards, One Health, Public Health, Zoonoses.

### INTRODUCTION

One health challenges including zoonosis are matters of global concern; in the recent past there have been reports of emerging and re-emerging zoonoses (Barbic *et al.*, 2015; Lessler and Orenstein, 2019). Some of the One Health challenges are related to animal handling especially during the slaughter process. These challenges include environmental pollution from ingesta, meat and meat product contamination from microorganisms, injuries to abattoir workers and zoonotic infections. Some of the documented zoonotic diseases include that abattoir workers are at increased risk of contracting include; Anthrax, Tuberculosis, Q fever, Leptospirosis, Cysticercosis, Coenurosis and Brucellosis (Banjo *et al.*, 2013; Luwumba *et al.*, 2019). Abattoir workers are in the fore front to ensure that slaughter process is carried out in appropriate facilities and in a manner that ensures wholesomeness of the final product and protection of the environment. These workers are at an increased risk of contracting the zoonotic disease owing to their close contact with animals and their products (Cook, 2014).

Slaughter house facilities need to put in place measures to reduce One Health risk during slaughter process. Failure of the slaughter facilities to maintain food hygiene can be attributed to inadequate infrastructure, non-hygienic practices, limited ante and post mortem inspection and low level of biosecurity measures (Cook *et al.*, 2017).

Endemic zoonoses are found wherever people interact with animals (Maudlin *et al.*, 2009), a study in western Kenya documented their effects of these zoonoses are underestimated (Cook *et al.*, 2017). Apart from the harmful effects these diseases have on animals, they are also a food safety and public health concern. They have varied public health and socio-economic implications hence their prevention and control should be a national priority (Munyua *et al.*, 2016, Cakmur *et al.*, 2015)

In Kenya, information on knowledge, attitudes and practices of abattoir operators on zoonotic diseases is scanty. This study therefore was carried out to determine and document the knowledge levels, attitude and practices of Narok County abattoir workers on zoonotic diseases.

### MATERIALS AND METHOD

This was a cross-sectional study carried out in Narok County, located in the South Rift region of Kenya. The study targeted different cadres of abattoir workers including; veterinarians, meat inspectors, flayers, and meat traders.

An observational and interview based cross sectional study targeting all workers in four (4) randomly selected abattoirs in Narok County, Kenya was conducted to determine their knowledge, attitude and practices on One Health. A total of sixty abattoir workers were interviewed based on their

willingness to participate in the study.

In each abattoir, consent was sought from the head of operations in the abattoir, who most of the time was either the inspector or the manager before carrying out the study. Interview audio files were transcribed and entered in Microsoft Excel for coding, cleaning and analysis.

**RESULTS**

Most (91.7) of the respondents were aged 50 years and below. The respondents' ages ranged from 18 to over 50 with 33/60 respondents (55%) being between 18-35 years old and this formed the bulk. This was followed by 35-50 years old at 22/60 respondents (36.7%) while those above 50 years old were only 5/60 respondents (8.3%). The bulk (43.3% or 26/60) of the abattoir workers had no formal education, 36.7% (22/60) and 16.7% (10/60) had attended primary and secondary education respectively while only 3.3% (2/60) had tertiary education. Males formed 83.3% (50/60) of the respondents while the females were 16.7% (10/60). Most of the respondents were protestants (39/60 or 65%). Catholics were 11/60 (18.3%), SDA 2/60 (3.3%) and only 1/60 (1.7%) of respondents was a Muslim. The others (7/60 or 11.7%) did not affiliate with any religion.

Most (81.7% or 49/60) of the abattoir workers were aware of zoonoses they could contract as a result of working in the abattoirs. The zoonotic diseases, the workers reported to be predisposed to as a result of their occupation included Anthrax (58.3%), Brucellosis (35%), Cysticercosis (10%); Rift Valley Fever (6.7%), Leptospirosis (1.7%); Q fever (1.7%) and They however attributed the occurrence and spread of these diseases to; smoking at work (36.7% ); presence of body wounds ( 49.98%); eating at work (40.8%); handling intestines (32.7%); poor hygiene (51.02%); and lack of or poor quality water (38.8%).

A majority of the respondents (83.3%) were aware of the importance of ante mortem animal inspection and reported that it helps to identify diseased animals hence protects consumers' health. Some of the diseases they reported to be contracted due to lack of ante mortem inspection included Anthrax, Cysticercosis, Pneumonia, Rift Valley Fever, Skin diseases, Foot and mouth disease among others.

Ninety seven percent of the abattoir workers were aware of Personal Protective Equipment (PPE) and indicated that they always put them on during work. They however had different reasons for putting on PPE. Amongst these were; compliance with the law 13.8% (8/58), for identification 24.1% (14/58), for protection from diseases and blood 37.9% (22/58); and for cleanliness 24.1% (14/58).

Most of the workers with no formal education had the highest number not being aware of zoonoses, followed by primary, then secondary while all those with tertiary education had the knowledge of zoonoses (Figure 1).

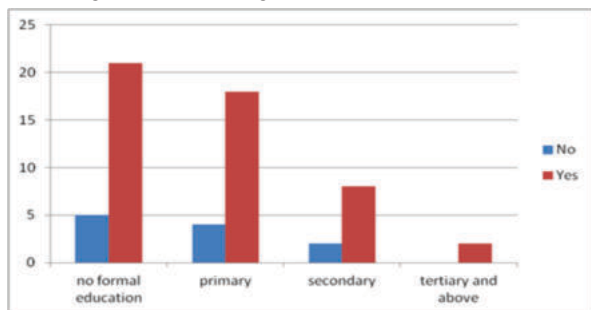


Figure 1: Relation between zoonoses awareness and level of education

**Practices and behaviours**

The study noted that 3/4 of the abattoirs had potable water supply, functional hand washing facility and toilets. Only one abattoir did not have potable water, its water was supplied in tanks and appeared dirty. Environmental pollution with polythene papers, manure, excessive noise and foul smell was noted in 2/4 of the abattoirs.

Two abattoirs were secured with perimeter fences and gates while the other 2 had no perimeter fence and had uncontrolled accesses by unauthorized persons, stray dogs and other animals. The workers reported that the presence of these dogs within the abattoir premises exposed them to the risk of dog bites . Other animals noted around the abattoirs were wild birds; mainly Marabou stork and crows.



Figure 2: Animal skin on the floor waiting processing; this can attract scavenging birds and animals.



Figure 3: Animal skin aired in the open; Scavenger birds (shown by arrow) therefore come to scavenge on meat remnants on the skin

**DISCUSSION**

The higher percentage (83.3%) of males among the abattoir in this study could be attributed to gender roles where males take care of livestock especially among the Maasai community where the study was conducted (Zimmerman et al 2015). The women are supposed to perform household chores, build houses, nurse and look after children (www.intracene.org) hence are not involved in income generation such as working in abattoirs. Therefore, the few women found working in the abattoir could have been driven to do so due to changes in community social structures forcing women to fend for their families (Mwangi, 2018).

The high level of persons with informal or primary level of education training among abattoir workers may be a hindrance in access to information relating to One Health, Zoonoses and Public safety in the meat industry. Any interventions targeting this group should therefore take into account their education levels and influence in the community. The Knowledge level on zoonoses among the abattoir workers was noted to be higher than a similar study conducted in western Kenya and another one in Nigeria where only 31%

and 21.1% of abattoir workers had good knowledge on zoonotic diseases respectively (Bakari *et al.*, 2015; Cook *et al.*, 2017). This can be attributed to the fact that livestock keeping is the main economic activity of the community mainly made of Maasai (Homewood *et al.*, 2009). Over time, these people may have learnt or become aware of the diseases they share with their livestock. Most of the diseases that they were aware of as zoonotic were: Anthrax, Rift Valley Fever, and Brucellosis. These diseases have been flagged by the Zoonotic Diseases Unit Kenya. Awareness level on key disease disease such as RVF was lower than that found in a study in Uganda which targeted both community members and abattoir workers where ninety percent of respondents were aware of the disease (de St. Maurice *et al.*, 2018).

All the respondents in this study were willing to learn more about zoonoses hence this attitude could have contributed to their increased knowledge of zoonoses. It has been demonstrated that providing training and awareness to people with occupational diseases risk such as farmers can result in considerable decrease in such diseases (Brumby and Smith, 2009, Kersting *et al.*, 2009, Umar and Nura, 2008). Factors like smoking at work, eating at work, cleaning intestines and having wounds were cited by respondents in this study as predisposing them to zoonotic diseases, similar findings were reported by Cook, (2014), who attributed them to increasing risk of contracting some of these zoonoses.

Presence of portable water, toilets and hand washing facilities in most of the abattoirs is an indication of good hygienic practice among the abattoir owners and workers. This finding was almost similar to the one made by Cook (2014) in Western Kenya where she reported that 60% of the abattoirs had toilets while only 20% had hand washing facilities. This practice helps in control of diseases including zoonoses. Lack of water for cleaning may cause accumulation of dirt leading to noxious smell upon decomposition hence air pollution. However, air pollution noted in this study was due to poor waste disposal but not due to lack of water. The poorly disposed waste in the abattoirs encouraged the presence of scavengers including birds, wild animals and stray dogs. This was worsened by lack of gates and fences hence free access by the scavengers. Stray dogs tend to forage together (Kitala *et al.*, 2001) hence their presence in area places humans within the vicinity at a higher risk of rabies.

While most workers interviewed in this study were observed to be putting on PPE, only a few of them could clearly explain how these might protect them from contracting zoonoses. This was higher than that reported by Cook (2017) in a study conducted in western Kenya. This practice can be due to a common knowledge that PPE is part of law requirement hence people just have them for compliance and not for protection especially against diseases. The role of PPE primarily is to protect meat product from contamination but has also been shown to be able to protect meat handlers from directly transmitted zoonoses such as Leptospirosis and Brucellosis (Umar and Nura, 2008).

## CONCLUSION

Abattoir workers in Narok County had limited knowledge on One health risks associated with their occupation. Several risky practices such as eating or smoking while at the slaughter house and handling working without covering skin wounds were either reported or observed. The study established that most of the abattoir workers did not have good understand of the importance of PPEs in Public health and safety and thus only wore them as a matter of compliance with regulation. Most abattoirs did not have adequate biosecurity measures necessary for ensuring food safety and sustenance of One Health.

The study recommends more training to be conducted for abattoir workers on knowledge and preventive practices for One Health work related risks. They should also be trained on their roles and good practices aimed at ensuring adherence to guidelines and good practices in animal processing and meat handling in abattoirs.

Close monitoring of Abattoirs to ensure owners provide facilities such as hand washing facility, toilets and PPE in order to reduce the risk of contracting zoonoses.

Practices such as ante mortem inspection must always be done so as to avoid exposure to diseased animals who may spread diseases to humans.

Training of abattoir workers on One Approach to food handling and occupational risk management should be carried out.

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## Recommendation