Herdsmen and Livestock Farmers’ Perception, Attitudes and Risk Factors towards Zoonotic Diseases in Awka North and South Local Government Areas, Southeastern Nigeria

Chukwunonso Francis OBI

Federal College of Education (Technical); School of Agriculture and Home Economics Education; Department of Agricultural Education, Umunze, Anambra State, Nigeria; drfrancisobi@gmail.com

Abstract

A cross-sectional survey utilizing semi-structured questionnaires was used to study the herdsmen and livestock farmers’ perception, attitudes and risk factors towards zoonotic diseases in Awka North and South Local Government Area. Data obtained were analyzed using chi-square on SPSS (Version 15.0) at a significance level of \( p < 0.05 \) to determine possible associations between variables and perceptions of zoonotic diseases. Out of the 384 respondents, 214 (55.7%) had heard about zoonotic diseases. Avian influenza (95.3%), rabies (90.9%) and bovine tuberculosis (64.3%) were perceived by the respondents to be zoonotic. Viruses (82.3%), punishment from gods (72.4%) and bacteria (52.1%) were also perceived by the respondents as major causes of zoonotic diseases, whereas 62% were of the view that zoonotic diseases are of no consequence. Only 26.3% (101) had overall knowledge of zoonotic diseases. Slaughtering of sick animals, drinking of raw milk, skin to skin contact with animals, contact with animals’ placenta, handling of animal with open wounds/cuts and keeping of pets were indicted as attitudes and risk factors of zoonotic diseases amongst the respondents. Significant associations \( (p < 0.05) \) were found between perceptions/awareness of zoonotic diseases and age, educational status and location. In conclusion, the herdsmen and livestock farmers’ awareness/perception of zoonotic diseases is abysmally poor in the study area, thus public education on zoonotic diseases is therefore hugely recommended.

Keywords: attitudes, livestock farmers, herdsmen, perceptions, risk factors, zoonotic diseases, Nigeria

Introduction

Since the onset of the 21st century, agriculture, more especially livestock production is continuously faced with horrendous challenges which adversely impacted on national development. Urbanization, exponential population growth and economic development contributed considerably to the increasing demand for meat, eggs and other animal products (Steinfeld et al., 2006). The attendant development of peri-urban systems for livestock production and intensification of animal husbandry have resulted in increased contact between people and livestock and, consequently, increased risk of diseases (Acha and Szpyres, 2003).

Animal disease outbreaks have recently made headlines and the threat of disease is diverse and changing. Some animal diseases are endemic, zoonotic, emerging and re-emerging as new diseases are emanating due to many factors such as expanding trade and climate change. The impact ranges from a small set-back in production to a devastating infection of both humans and animals leading to morbidity and mortality. In Africa, especially in Nigeria, globalization and the encroachment of people and their livestock into wildlife areas has heightened the problems and the risks of animal to human disease transmission (Marcotty et al., 2009).

Zoonotic diseases (also known as zoonoses) are diseases that are naturally transmissible between humans and animals (both domestic and wild animals), posing threats to public health and food security worldwide (Kahn, 2006; Karesh et al., 2012; WHO, 2015). Zoonotic diseases have been recognized for many centuries with over 200 described and are caused by all types of pathogenic agents (Nkuchia et al., 2007). Transmission of zoonotic diseases occurs mostly through vectors, direct contact with animals or their secretions, and through consumption of contaminated food and water (Tesfaye et al., 2013).

Reports have indicated that more than half of all human infectious diseases are of animal origin and about 75% of emerging human diseases are zoonotic (Jones et al., 2008). Zoonotic diseases were also estimated to cause about a billion cases of illness in humans and millions of deaths every year and disproportionately affect low-income countries, with the poorest within society affected the most (Osbjer et al., 2015). The true public health and economic impact of zoonotic diseases are most likely underestimated, mainly due to under-reporting of disease events (Grace et al., 2012; Osbjer et al., 2015).

Local data on the occurrence of zoonotic infections in humans and animals in Anambra State are not well documented, however few studies and outbreaks have been
reported (Nweze and Okafor, 2005; Mbata et al., 2007; Emnny-Egbe et al., 2012). Livestock farmers and animal handlers amongst others were reported to be at risk of contracting zoonotic diseases as their work via different livestock management practices and environmental circumstances, brings them in close proximity with animals and animal products (Musa et al., 2007; Swai et al., 2010). These practices, which could affect the risk of zoonoses in the various livestock keeping systems and to the public as whole, will depend on awareness, perceptions, knowledge and attitude to zoonoses (Shirima et al., 2003; John et al., 2008). Till date, no study has performed to assess the perceptions, knowledge, attitudes and practices of livestock farmers and herdsmen in Anambra State towards zoonotic diseases and their public health challenges to national development. Therefore, the aim of this study was to assess the perceptions/level of awareness, attitudes and risk factors of zoonotic diseases amongst livestock farmers and herdsmen in Awka North and South Local Government Areas of Anambra State, South-eastern Nigeria.

Materials and Methods

Study area and population

The study was carried out in Awka North and Awka South Local Government Areas of Anambra State, Southeastern Nigeria between February and April 2015. Awka North and South Local Government Areas are within the Capital Territories of Anambra State with geographical coordinates of approximately 6°15’N 7°10’E / 6°25’N 7°16’E and 6°10’N 7°04’E / 6°16’N 7°06’E respectively. Awka North Local Government Area consists of ten towns namely Achalla, Amanuke, Urum, Isuanioha, Mgbakwu, Amasara, Awba Ofemili, Ugbevu, Ezinato and Isiagu while Awka South Local Government Area is made up of nine towns namely Isiagu, Mbaukwu, Nibo, Nise, Okpuno and Umuawulu. Awka and Amawbia towns are urban towns and serves as the seat of the state government whereas Okpuno is a peri-urban town. The towns in Awka North are rural towns. Amasara has large population Hausa/Fulani cattle herdsmen. The population of Awka North and South Local Government Areas is 112, 192 and 189, 654 respectively (NPC, 2007).

The study population consisted of livestock farmers and herdsmen in Awka North and South Local Government Areas of Anambra State.

Ethical approval

Ethical approval was not necessary for this study. However, informed consent from all participants involved in the study was obtained and confidentiality of the data obtained was ensured.

Study design and sampling procedure

Between February and April, 2015, a questionnaire based cross-sectional study was conducted to assess the perceptions/level of awareness, attitudes, and risk factors of zoonotic diseases amongst livestock farmers and herdsmen. Isu Aniocha, Mgbakwu, Amasara, and Achalla towns in Awka North and Awka, Okpuno and Amawbia towns in Awka South were selected by simple random sampling. The sample size was estimated at 384 participants from all the selected towns in the two local government areas using the method of Thrushfield (1997):

\[
n = \frac{1.96^2 \times P_{exp} (1 - P_{exp})}{d^2}
\]

Where \( n \) = sample size, \( P_{exp} \) = expected proportion of knowledge about zoonotic diseases which was assumed to be 50% and \( d \) = desired absolute precision level which was assumed to be 5%. Selection of livestock farmers and herdsmen were based on their willingness to participate in the study.

Data analysis

The data obtained were analyzed using SPSS version 15.0.

Chi-square (\( \chi^2 \)) was used to determine the possible association between variables and the awareness/knowledge of zoonotic diseases. Values of \( P < 0.05 \) were considered significant.

Results

Socio-demographic characteristics of the respondents

A total of 384 participants from the randomly selected towns in Awka North and South Local Government Area were sampled. Majority of the respondents (62.5%, 240) were between the ages of 31 and 50 years old, 258 (67.2%) of the respondents were males while 126 (32.8%) were females. 240 (62.5%) of the respondents were based in Awka North Local Government Area while 144 (37.5%) were in Awka South Local Government Area.

Of the 384 respondents, 215 (56%) were livestock farmers while 169 (44%) were herdsmen (Table 1).

Perception/level of awareness of zoonotic diseases

Of the 384 respondents, only 101 (26.3%) had overall knowledge of zoonotic diseases while 214 (55.7%) of the respondents had heard about zoonoses. Avian influenza or bird flu (366, 95.3%), Rabies (349, 90.9%) and bovine tuberculosis (247, 64.3%) were the only diseases perceived by majority of the respondents to be zoonotic (Figure 1). Viruses (316, 82.3%), punishment from gods (278, 72.4%) were believed by the respondents as means of contracting zoonoses. Avian influenza or bird flu (366, 95.3%), Rabies (349, 90.9%) and bovine tuberculosis (247, 64.3%) were the only diseases perceived by majority of the respondents to be zoonotic (Figure 1).
zoonotic diseases (Table 2).

The study also showed significant ($P < 0.05$) association between awareness of the respondents about zoonotic diseases and their ages, educational status and their locations (urban, peri-urban and rural areas). Sex was not found to exert any influence ($P > 0.05$) on the awareness of respondents about zoonotic diseases.

### Attitudes and risk factors of zoonotic diseases

More than half of the respondents (195, 50.8%) agreed to have been slaughtering sick animals whereas 59.4% (228) of the respondents drink raw milk. A high proportion of the respondents (311, 81%) do have skin contact with animals on daily basis. Contact with placenta of animals (248, 64.6%), handling of animals with open wounds or cuts (256, 66.7%) and keeping of dogs (249, 64.8%) are other risk factors mentioned by participants (Table 3). Drinking of raw milk was found to be common ($P < 0.05$) amongst the herdsmen than the livestock farmers. The risks of contracting zoonotic diseases were also found to be greater ($P < 0.05$) amongst the herdsmen and the respondents in the rural areas.

### Discussion

The nexus between the environments, animal and human populations are very close and thin especially in developing countries like Nigeria where animals play vital roles (Obi et al., 2013; Babu et al., 2015). Serious public health risks (zoonoses) with huge economic consequences often result when the animal-human link is poorly managed (WHO, 2015). Reviewing of the perception/awareness, attitudes and risk factors of zoonotic diseases is very crucial towards formulation and effective implementation of appropriate disease prevention and control strategies (Babu et al., 2015). Awareness and perception about zoonotic disease amongst high risk groups are also crucial in influencing the health seeking behavior of patients as well as controlling their transmission in animals and humans.

The results obtained from this study have demonstrated that the overall level of awareness or knowledge about zoonotic diseases amongst livestock farmers and herdsmen is very poor (26.3%), though more than half of the respondents (55.7%) had heard about zoonotic diseases. The rural towns in Awka North Local Government Area had significantly low ($p<0.05$) perception/awareness of zoonotic diseases compared to the urban and peri-urban towns of Awka South LGA. These differences in the awareness of zoonotic diseases between rural and urban areas obtained in this study could be attributed to life style, educational status, exposure and means of information dissemination. Age was found to be significantly associated ($p<0.05$) with awareness of zoonotic disease as respondents within the age range of 31 – 50 years were aware of zoonotic diseases more than other age groups. Awareness was also found to be high ($p<0.05$) amongst respondents with a minimum of secondary education or higher (55.7%) had heard about zoonotic diseases. The rural towns in Jimma, Southwestern Ethiopia (Swai et al., 2010) amongst animal health practitioners in Tanzania; John et al. (2008) amongst medical practitioners in Tanzania and Tesfaye et al. (2013) amongst the public in Jimma, Southwestern Ethiopia. However, these findings contrasted with those reported by Girma et al. (2012) in Addis Ababa who reported high level of awareness about zoonotic diseases; Pfuekenyi et al. (2010) in Harare, Zimbabwe, and Awosanya and Akande (2015) in University community of Ibadan, Nigeria who reported fair awareness amongst pet owners.

Most respondents were able to outline some infectious diseases that are zoonotic in nature but could not associate to

### Table 1. Socio-demographic characteristics of the herdsmen and livestock farmers in the study area

| Socio-demographic characteristics | Frequency | Percentage (%) |
|----------------------------------|-----------|----------------|
| Age                              |           |                |
| less than 30                     | 97        | 25.3           |
| 31-50                            | 240       | 62.5           |
| 51 and above                     | 47        | 12.2           |
| Sex                              |           |                |
| Male                             | 258       | 67.2           |
| Female                           | 126       | 32.8           |
| Educational Status               |           |                |
| No Formal education              | 139       | 36.2           |
| Primary Education                | 58        | 15.1           |
| Secondary Education              | 150       | 39.1           |
| Tertiary Education               | 37        | 9.6            |
| Location                         |           |                |
| Urban                            | 90        | 23.4           |
| Periurban                        | 54        | 14.1           |
| Rural                            | 240       | 62.5           |
| Occupation                       |           |                |
| Livestock farmer                 | 215       | 56             |
| Herdsmen                         | 169       | 44             |

### Table 2. Perceptions/level of knowledge possessed by respondents about zoonotic diseases

| Overall knowledge of zoonotic disease | Frequency | Percentage (%) |
|--------------------------------------|-----------|----------------|
| Heard about zoonotic diseases        |           |                |
| Yes                                  | 214       | 55.7           |
| No                                   | 170       | 44.3           |
| What cause zoonotic disease?         |           |                |
| Bacteria                             | 200       | 52.1           |
| Fungi                                | 88        | 22.9           |
| Virus                                | 316       | 82.3           |
| Parasite                             | 129       | 33.6           |
| Punishment from God                  | 278       | 72.4           |
| How do human get infected?           |           |                |
| Eating of infected raw/uncooked meat | 124       | 32.3           |
| Drinking of raw milk                 | 247       | 64.3           |
| Consumption of contaminated food and water | 132 | 34.4 |
| Bites from animals                   | 118       | 30.7           |
| Direct contact with blood and secretions from animals | 68 | 9.1 |
| Inhalation                           | 35        | 17.7           |

### Implications of zoonotic diseases

| Implications of zoonotic diseases | Frequency | Percentage (%) |
|----------------------------------|-----------|----------------|
| Death                             | 134       | 34.9           |
| General body weakness             | 278       | 72.4           |
| Reduced productivity              | 200       | 52.1           |
| Infertility                       | 88        | 22.9           |
| Skin diseases                     | 139       | 36.2           |
| Nothing                           | 238       | 62             |
such diseases as zoonoses. Thus, it appear that the use of the term zoonotic diseases or zoonoses for any disease or infection that are naturally transmissible from vertebrate animals to human beings is restricted to medical and veterinary professions. Therefore, veterinary extension is of utmost importance in addressing some of these deficiencies in knowledge by most of the respondents.

Avian influenza, rabies and bovine tuberculosis were the major zoonotic diseases as was indicated by majority of the respondents in the study area. Rabies, bovine tuberculosis, taeniasis, anthrax and hydatidosis were reported by Tesfaye et al. (2013) to be the major zoonotic disease in Ethiopia. Girma et al. (2012) in Addis Ababa tipped anthrax, taeniasis, bovine tuberculosis and brucellosis while Awosanya and Akande (2015) in Ibadan, Nigeria reported rabies, Lassa fever, and avian influenza to be the major zoonotic diseases. The publicity given to avian influenza during its last scourge in Nigeria with attendant loss of human life could be responsible for its high awareness as a zoonotic disease. Several studies have also indicated high awareness of rabies as a zoonotic disease (Awosanya and Adebimpe, 2013; Stull et al., 2012). The high awareness of rabies could be due to the importance placed on it as a typical zoonotic disease in Nigeria (Adeleji et al., 2010). Bovine tuberculosis has also received fair publicity especially from non-governmental organizations. Underreporting and low incidence of zoonotic diseases could be the reason for the non-recognition of other infectious diseases as zoonotic diseases by the respondents.

Majority of the respondent believed that virus, punishment from gods and bacteria are the major cause of zoonotic disease. Also 62% of the respondents believed that zoonotic diseases do not have any implications to human health. The poor educational status of most respondents especially those in the rural areas are thought to be the reason behind such beliefs. This portends grave danger and requires the prompt extension intervention by the federal, state, local government, faith based and non-governmental organizations through jingles, adverts, seminars, symposia on causes, symptoms, and means of transmission, implications and preventive measures against zoonotic diseases.

Attitudes and risk factors of zoonotic diseases as indicated by the respondents includes slaughtering of sick animals, drinking of raw milk, skin to skin contact with animals, contact with the placenta of animals, handling of animals with cuts or wounds/cuts and keeping of dogs or pets. Most of the respondents are aware of the implications of slaughtering sick animals and handling of animals’ blood thereby exposing themselves to increased chances of contracting zoonoses.

Drinking of raw milk was found to be very common amongst the herdsmen while slaughtering of sick animals was more common amongst the livestock farmers. Raw milk drinking amongst the herdsmen could be attributed to their norms, cultures and feeding habits as many food varieties are made from the raw milk. Although most of the respondents are aware of the implications of slaughtering sick animals and drinking of raw milk, however, they still remain a common practice especially in rural areas and could be attributed to poverty amongst other reasons.

The risk of contracting zoonotic diseases were found to be significantly \( p<0.05 \) high amongst herdsmen and in rural areas. This was consistent with the findings of Swai et al. (2010) about rural areas. Lack of information/extension services and illiteracy could be a factor as there seems to be more enlightened people in urban areas with easy access to information than in rural areas.

Conclusions

The overall perception/level of awareness of zoonotic diseases amongst herdsmen and livestock farmers in Awka North and South LGA is abysmally poor. The attitudes of livestock farmers and herdsmen in the study area predispose them to huge risk of contracting zoonotic diseases, thus presenting grave challenges to national development. Awareness should be embarked on via public education about zoonotic diseases and their preventive measures as a matter of urgency to ensure public safety.

Acknowledgements

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. However, the author wishes to appreciate Mallam Yahaya Umar and Mallam Ibrahim for their assistance in translating and administering the questionnaires in Hausa Language.
References

Acha PN, Szyfres B (2003). Zoonoses and communicable diseases common to man and animals. Vol. 1. Bacterioses and Mycoses. Pan American Health Organization (3rd ed), Washington.

Adeaja AO, Eyanre OD, Okonkwo IO, Ojeze MO, Amusan TA, Ababakar MJ (2010). Why is there still rabies in Nigeria? A review of the current and future trends in the epidemiology, prevention, treatment, control and possible elimination of rabies. British Journal Dairy Sciences 1(1):10-25.

Apel K, Hirn H (2004). Reactive oxygen species: metabolism oxidative stress and signaling transduction. Annual Review of Plant Biology 55:373-399.

Aravind P, Prasad MNV (2005b). Cadmium-Zinc interactions in hydroponic system using Ceratophyllum demersum; adaptive plant ecophysiology, biochemistry and molecular toxicology. Brazilian Journal of Plant Physiology 17(1):3-20.

Awosanya AEJ, Adeabimpe AP (2013). Factors associated with rabies awareness and attitude to dog bite in a university community. Bulletin of Animal Health and Production in Africa 61(4):559-570.

Awosanya EJ, Akanbi HO (2015). Animal health care seeking behavior of pets or livestock owners and knowledge and awareness on zoonoses in a university community. Veterinary World 8(7):841-847.

Babu AJ, Ramya P, Rao LV, Swetha CS, Sudhanthiramani, Rao KV (2015). A study on the awareness and knowledge of zoonotic diseases among the public in and around Proddatur, YSR Kadapa District, Andhra Pradesh, India. International Journal of Recent Scientific Research 6(7):5131-5138.

Emmy-Egbe IO, Ekweisyanya EO, Ukaga CN, Enanya CI, Ajacro CMU (2012). Prevalence of intestinal helminthes in students of Ihiala Local Government Area of Anamba State. Journal of Applied Technology in Environmental Sanitation 2(1):23-30.

Girma S, Zewde G, Tafess K, Jibat T (2012). Assessment of awareness on food borne zoonoses and its relation with veterinary public health services in and around Addis Ababa. Journal of Public Health and Epidemiology 4(2):48-51.

Grace D, Gilbert J, Randolph T, Kangethe E (2012). The multiple burdens of zoonotic disease and an ecohealth approach to their assessment. Tropical Animal Health and Production 44(Suppl1):67-73.

John K, Kazwala R, Mfinanga GS (2008). Knowledge of causes, clinical features and diagnosis of common zoonoses among medical practitioners in Tanzania. BMC Infectious Diseases 8(1):162.

Jones KE, Patel NG, Levy MA, Storey JD, Ball D, Gittleman JL, Daszak P (2008). Global trends in emerging infectious diseases. Nature 451:990-993.

Kahn LH (2006). Confronting zoonoses, linking human and veterinary medicine. Emerging Infectious Disease 12(4):556-566.

Karesh WB, Dobson A, Lloyd-Smith JO, Lubroth J, Dixon MA, Bennett M, et al. (2012). Ecology of zoonoses: natural and unnatural histories. The Lancet 380(9857):1936-1945.

Marcotty T, Matthys F, Godfray J, Rigouts L, Ameni G, et al. (2009). Zoonotic tuberculosis and brucellosis in Africa: neglected zoonoses or minor public-health issues? The outcomes of a multidisciplinary workshop. Annals of Tropical Medicine and Parasitology 103(5):401-411.

Mbatu TI, Nwajagu CC, Nwajagu CC (2007). Dermatophytes and other fungi associated with scalp-hair of nursery and primary schools. Sudanese Journal of Dermatology 5(1):15-21.

Musa OI, Akanbi AA, Bolarinwa OA (2007). Epidemiology and control of zoonotic infections in Nigeria. African Scientist 8(2):109-114.

Nigerian Population Commission. Federal Republic of Nigeria (NPC/FRN) (2007). Special FRN, Gazette no 23 on the 2006 population census.

Nkuchia MM, Ruth L, Chris AB, Henriette V (2007). Infectious disease surveillance, John Wiley and Sons, 2008.

Nwede EI, Okara JI (2005). Prevalence of dermatophytic fungal infections in children: A recent study in Anambra State, Nigeria. Mycopathologia 160(3):239-243.

Obi CF, Obidike IR, Eze IO, Omoja VU, Iheagwam CN, Ikida IK, Ezekonkwo RC (2013). Effects of Trypanosoma brucei infection and diminazene aceturate therapy on testicular morphology and function of Nigerian local dogs. Veterinary Parasitology 196(3):283-288.

Osbjer K, Boqvist S, Sokerya S, Kannarath C, San S, Davunand H, Magnusson U (2015). Household practices related to disease transmission between animals and humans in rural Cambodia. BMC Public Health 15:476.

Pfikeny D, Chipunga S, Dinginy L, Matenga E (2010). A survey of pet ownership, awareness and public knowledge of pet zoonoses with particular reference to roundworms and hookworms in Harare, Zimbabwe. Tropical Animal Health and Production 42(2):247-252.

Shirima GM, Fitzpatrick J, Cleaveland S, Kambarage DM, Kazwala RR, Kunda J, French NP (2003). Participatory survey on zoonoses affecting livestock keeping communities in Tanzania. Journal of Animal and Veterinary Advances 2:253-258.

Steinfield H, Gerber P, Wassenaar T, Castel V, Rosales M, de Haan C (2006). Livestock’s long shadow: Environmental issues and options. Food and Agriculture Organization, Rome.

Stull JW, Peregrine AS, Sargeant JM, Weese JS (2012). Household knowledge, attitudes and practices related to pet contact and associated zoonoses in Ontario, Canada. BMC Public Health, 12(1):553.

Swai ES, Schoonman L, Daborn CJ (2010). Knowledge and attitude towards zoonose among animal health workers and livestock keepers in Arusha and Tanga, Tanzania. Tanzania Journal of Health Research 12(4):282-288.

Tesfaye D, Fekede D, Tigre W, Regassa A, Fekadu A (2013). Perception of the public on the common zoonotic diseases in Jimma, southwestern Ethiopia. International Journal of Medicine and Medical Sciences 5(6):279-285.

Thrusfield M (1997). Veterinary Epidemiology. Butterworths Publishers (2nd ed), London.

World Health Organization (WHO) (2015). Zoonoses. Retrieved 2015 Aug 27 from: http://www.who.int/topics/zoonoses/en/.