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Original Article

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

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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 Szyfres, 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 disproportionally 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

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reported (Nweze and Okafor, 2005; Mbata *et al*., 2007; Emmy-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 been 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 of Nigeria with geographical co-ordinates of approximately $6^0$15'N $7^0$10'E / 6.250^0N 7.167^0E and $6^0$10'N $7^0$04'E / 6.167^0N 7.067^0E respectively. Awka North Local Government Area consists of ten towns namely Achalla, Amanuke, Urum, Isu-aniocha, Mgbakwu, Amansea, Awba Ofemili, Ugbenu, Ebenebe and Amanasa while Awka South Local Government Area is made up of nine towns namely Amawbia, Awka, Ezinato, 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. Amansea 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, Amansea, 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 Thrusfield (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.

Study design and data collection

Information about the perception/level of awareness, attitudes and risk factors of zoonotic diseases as well as the socio-demographic characteristics of the respondents were collected using semi-structured interviewer administered questionnaire. The questionnaire was administered in English, Igbo and Hausa languages. Upon the completion of the questionnaire, the interviewer provided the respondents with relevant zoonotic disease information and gave the respondents the opportunity to ask questions.

Data analysis

The data obtained were analyzed using SPSS version 15.0. Chi-square (χ^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. Majority of the respondents (56.3%, 216) were Christians and 187 (48.7%) had attained a minimum of secondary education.

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%) and bacteria (200, 52.1%) were believed by the respondents as the causes of zoonotic diseases. Responses from the participants depicted general body weakness (278, 72.4%) to be the major implication of zoonotic diseases. However, 62% (238) of the respondents were of the view that zoonotic diseases do not have any implications. Eating of raw meat (247, 64.3%) was believed to by respondents as a means of contracting

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

	Frequency	Percentage (%)
Overall knowledge of zoonotic disease	101	26.3
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/undercooked 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		
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

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 more. The fact that some elementary aspect of zoonoses and infectious diseases are being taught in secondary schools could be attributed to that. The finding of low overall awareness of zoonotic diseases amongst the respondents in this study are consistent with those of 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; Pfukenyi *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 3. Attitudes and risk factors of zoonotic diseases amongst the herdsmen and livestock farmers in the study area

Attitudes/ Risk factors	Frequency	Percentage (%)
Wearing of protective clothing	260	67.7
Walking barefooted in animal's pen	101	26.3
Washing of hands	312	81.3
Eating of raw meat	121	31.5
Slaughtering of sick animals	195	50.8
Drinking of raw milk	228	59.4
Drinking of raw/improperly boiled animals' blood	31	8.1
Prefers well cooked meat	197	51.3
Skin to skin contact with animals	311	81
Contact with placenta of animals	248	64.6
Handling of animals with cuts or wounds	256	66.7
Keeping dogs or other pets	249	64.8
Bitten by dogs before	33	8.6

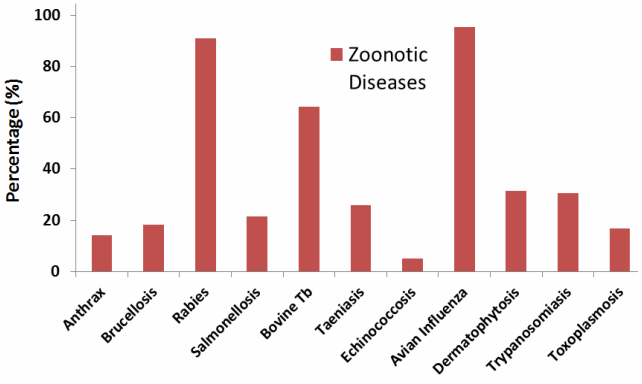

Fig. 1. Zoonotic diseases as perceived by the herdsmen and livestock farmers in Awka North and South Local Government Area

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 professionals. 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 (Adedeji *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 open wounds/cuts and keeping of dogs or pets. Most of the respondents seems to be aware of the risk involved through consumption of animal products, however, only few are aware of the risk of direct transmission via contact with placenta, skin to skin contact with animals. Thus, they are unlikely to take proper precaution or use protective clothing 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.

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