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Original article

A field survey on the assessment of awareness about contagious bovine pleuropneumonia (CBPP) in rural pastoral communities of Dutsinma Region, Katsina State, Nigeria

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ABSTRACT

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A field survey was conducted to assess the level of awareness about Contagious Bovine Pleuropneumonia (CBPP) in rural pastoral communities of Dutsinma Region, Katsina state. Structured questionnaires and methods of participatory epidemiology were employed to generate data during the survey. It was observed that CBPP level of awareness in Dutsinma region is significantly associated with risk factors ($p < 0.05$). The study also shows that the level of awareness is not significantly associated with age of agro pastoralist in the region ($p < 0.05$). It was concluded that Most of the pastoralists in the region can only recognize signs such as coughing and labored breathing which are only evident during acute stage of the disease. Therefore, subclinical or chronic CBPP forms may likely have been passed unnoticed and thus unreported. Also, CBPP level of awareness in Dutsinma region is significantly associated with risk factors (livestock stocking density, herd type and location, climate change, sharing feed and water source and extensive grazing) and hence the need for Public health sensitization campaigns and the provision of grazing and watering facilities for livestock.

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1. Introduction

Dutsin-Ma is a Local Government Area (LGA) in Katsina State, Nigeria. Its coordinates are 12°27'18"N and 7°29'29"E. Its headquarters are in the town of Dutsin Ma. The Zobe Dam lies to the south of the town of Dutsin Ma (Isah, 2009). Dutsin-ma became a Local Government in 1976. The chairman is the official Head of Local government. The inhabitants of the Local Government are predominantly Hausa and Fulani by tribe. Their main occupation is farming and animal rearing (Wikipedia, 2012). The LGA has an area of 527 km² and a projected population of 169,671 at the 2006 census. The LGA has 11 political wards viz , bagagadi, dabawa, dutsinma A, dutsinma B, karofi A, karofi B, kuki A, kuki B, kutawa, makera and shema. There are 296 settlements in Dutsinma LGA. The postal code of the area is 821 (NIPOST, 2009).

Contagious Bovine Pleuropneumonia (CBPP) is a highly infectious, contagious (Cassel et al, 1985) and economically important disease of cattle caused by *Mycoplasma mycoides* (Osiyemi, 1981; Egwu et al 1996) and characterized by severe exudative pleuropneumonia and pleurisy (Provost et al, 1987). The disease has a worldwide distribution (Provost et al, 1987) and is transmitted by direct contact and inhalation droplets from expired air from the clinical cases or carriers of the infection (lungers) particularly amongst susceptible animals (Nawathe, 1992). Transmission occurs from direct and repeated contacts between sick and healthy animals. The first incidence of the disease in Nigeria was recorded in 1924 when reliable records were first available (Foluso, 2004). Contagious Bovine Pleuropneumonia is a transboundary cattle disease of great economic importance at both herd and national stages (Mtui-Malamsha, 2009). Manifestation of CBPP shows a wide range of severity and signs (Provost et al., 1987). It could vary from persistent coughing and labored breathing as a result of pneumonia and pleurisy in adult animals to lameness in calves due to arthritis (FAO, 2008). Some animals appear to be resistant to infection by MmmSC and subclinical cases are also common (Mtui-Malamsha., 2009). In Africa, the disease was first reported in 1854, when an infected bull was imported into South Africa from the Netherlands (Mtui-Malamsha, 2009) and has since then been endemic in large areas of sub-saharan Africa almost 150 years later with serious implications for cattle production and major constraints to food security in affected countries (Amanfu, 2009). Presently, CBPP is the most important cattle disease in Nigeria because of its considerable effects on livestock production and rural economy. The country suffers from both direct losses through deaths of cattle, and indirect losses by exclusion from participation in international livestock products trade (Fasanmi, 2003). Prevalence of the disease in Nigeria varies with the diagnostic tests applied and can be as high as 32% based on competitive ELISA (Aliyu et al., 2003). In Africa, the disease was first reported in 1854, when an infected bull was imported into South Africa from the Netherlands (Mtui-Malamsha, 2009) and has since then been endemic in large areas of sub-saharan Africa almost 150 years later with serious implications for cattle production and major constraints to food security in affected countries (Amanfu, 2009). Presently, CBPP is the most important cattle disease in Nigeria because of its considerable effects on livestock production and rural economy. The country suffers from both direct losses through deaths of cattle, and indirect losses by exclusion from participation in international livestock products trade (Fasanmi, 2003). Prevalence of the disease in Nigeria varies with the diagnostic tests applied and can be as high as 32% based on competitive ELISA (Aliyu et al., 2003).

1.1. Aims and objectives

1.2. Aims

To assess the level of awareness about CBPP in Rural pastoral communities of Dutsinma region, Katsina state and to compare it with existing records in the state zonal veterinary clinic.

1.3. Objectives

1. To measure the degree of awareness of CBPP in the pastoral communities of dutsinma LGA, Katsina State.
2. To evaluate the knowledge, perception and attitude of the pastoral communities towards the disease; CBPP.
3. To collect, collate and analyze data related to CBPP in the zonal veterinary hospital, Dutsinma and compare it with field findings.
4. To share key findings and offer technical recommendation to the concerned authorities

1.4. Research hypothesis

1.4.1. Null hypothesis

There is no significant difference between age of pastoralists and level of awareness about CBPP in Dutsin-Ma LGA, Katsina State.

1.4.2. Alternate hypothesis

There is significant difference between age of pastoralists and level of awareness about CBPP in Dutsin-Ma LGA, Katsina State.

2. Materials and methods

2.1. The study area

The field work was conducted in 10 out of the 11 wards of Dutsinma LGA covering latitude 1219.93977(12019'94) N to 1231.67585(12031'64) N and longitude 72.755(7027'55'') E to 72.908(7029'08'') E.

2.2. Structured questionnaire

Questionnaires were developed using Epi info version 7. The questionnaires went through a pre-test and were analyzed and re-evaluated based on the understanding of the respondents.

2.3. Hardo contact list form

Similarly, a form was designed to get names and phone contacts of the hardos by settlements in the LGA.

2.4. Sampling

Random sampling of 10 rugas per ward was done. 10 wards were visited and sampled. A total of 100 rugas were sampled during the period of the field work (October to November, 2013).

2.5. Statistical analysis

Qualitative and quantitative analysis of feedback data was done using Epi info version 7[®]. Significance in the level of awareness was tested using Chi-square test as described by Antony Stewart, 2002.

Pastoralists' knowledge of CBPP was accessed with nine items each of clinical signs using prompted recall format (Waller et al., 2004) based on a 9-point score. Herdsmen's response will be summed up into 3 categories based on their scores,

- Scores of 0-2 will be classified as having very limited awareness
- Scores of 3-4 will be classified as having limited awareness
- Scores of >4 will be classified as having Good awareness

2.6. Best practices

The following activities were conducted before and during the field work which really facilitated the field work.

1. Advocacy to the Katsina state director of veterinary service (DVS), Dutsinma zonal veterinary officer and Dutsinma LGA director of agric to seek their consents.
2. Advocacy to the chairman of Dutsinma LGA Miyetti Allah group and scheduled a meeting with all the hardos and fulanis of the LGA.
3. Use of Local guides to identify rugas in the different wards and settlements sampled.
4. Sensitization of the Fulani on the essence of the field work.
5. Desk review and debriefing of key findings to the LGA agric coordinator and zonal vet officer.

3. Results

3.1. Socio demographic characteristics of the respondents

Analysis of the GPS coordinates shows that the area covered during the field work ranges from latitude 1219.93977(12019'94) N to 1231.67585(12031'64) N and longitude 727.55727(72075'52) E to 729.08137(72090'81) E.

A total of 10 wards were sampled in which 100 rugas were served with the questionnaires.

The total number of herds (herd size) sampled during the period is 3348 with a mean herd size of 33.82±28.43.



Plate 2.6.1. Focused Group Discussion with the Miyatti Allah Group, Dutsin-Ma LGA.

Table 3.1.1
Demographic characteristic of respondents.

characteristics	Total No of Respondents. N=100	Specific Rates (%)
AGE(Years)		
<19	0	0
20-30	4	4
31-40	23	23
>40	73	73
EDUCATIONAL STATUS		
Informal	89	89
Read and Write	11	11
OCCUPATION		
Nomadic Pastoralists	19	19
Agro Pastoralists	74	74
Daily Labourers	7	
GENDER		
Male	99	99
Female	1	1



Plate 3.2. Local guide and data collector.



Plate 3.3. Sampling a ruga in makera ward, Dutsin-Ma LGA Katsina State.

Table 3.1.2

the categorization of response as regards causes of CBPP.

Variable	Total No of Respondents N = 100	Percent %,
Causes of CBPP		
Bacteria	23	23
Cold	44	44
Pasture	21	21
Soil	12	12
TOTAL	100	100

Table 3.1.3

Categorization of response as regards common symptoms of CBPP.

Variable	Total No of Respondents N = 100	Percent %,
Cough	60	60
Diarrhea	41	41
Recumbency	14	14
Death	32	32
Inappetance	17	17
difficulty in breathing	60	60
unwillingness to move	13	13
salivation	29	29
fever	47	47

Table 3.1.4

Chi-square table for testing if level of awareness about CBPP is dependent upon age.

Level of awareness	<40 years	>40 years	Total
Very limited	9	18	27
Limited	17	46	63
Good	5	5	10
Total	31	69	N = 100

Rejection rule, Reject null hypothesis (Ho) if calculated chi square ($|\lambda^2|$) is \geq critical level at allowable error ($\alpha = 0.05$ and degree of freedom = 2)

Table 3.1.5

Chi square result.

Allowabl e error(α)	Degree of freedom (df)	Critical level at $\alpha = 0.05$, d.f of 2	Calculated chi square ($ \lambda^2 $)	CONTACT	WARD
0.05	2	5.99	2.23	070-84745719	Kutawa
				070-36207108	Karofi B
				070-19751328	Makera

Table 3.1.6

Categorization of response as regards Transmission and transmission routes of CBPP.

Variable	Total No of Respondents N = 100	Percent %,
Animal to animal transmission		
Yes	86	86
No	10	10
don't know	4	4
Transmission Ways ,		
Air	54	54
Wound of infected animal	3	3
Ingestion of contaminated feed	49	49
Ingestion of contaminated water	52	52

3.2. Livestock data in the zonal veterinary clinic.

Monthly disease report form of National Animal Disease Information System (NADIS) is the only record available as a data collection tool in the veterinary clinic Dutsin-ma. Data recorded in the form include,

1. Reporting unit
2. Reporting period
3. Date of report
4. Disease
5. Control vaccination
6. Prophylactic vaccination
7. Source of vaccine
8. Batch number of vaccine

A total of 5,843 animals were vaccinated (prophylactic vaccination) in 2012 based on the NADIS record. No record of vaccination in 2013. There was no government sponsored campaign for CBPP immunization in 2013. The vaccines used were supplied by the Nigerian Veterinary Research Institute, Vom Plateau State, Nigeria.

Table 3.1.7

Categorization of response as regards Prevention and Treatment of CBPP.

Variable	Total No of Respondents N = 100	Percent %,
Is CBPP Preventable ,		
Yes	96	96
No	4	4
don't know	0	0
Prevention Ways ,		
Avoid sharing drinking and feeding materials	28	28
Avoid contact with new animals	31	31
vaccination	47	47
Quarantine	6	6
Can The Disease be Treated ,		
Yes	96	96
No	4	4
Treatment Methods		
Traditional medicine	26	26
Orthodox medicine	45	45
Orthodox and Traditional	26	26
Don't know	3	3

Table 3.1.8

Categorization of response as regards factors responsible for the spread of CBPP.

Factor	Total No of Respondents N = 100	Percent %,
Stocking density	21	21
Herd type	28	28
Herd location	33	33
Climate change	19	19
Sharing feed and water source	11	11
Extensive grazing	10	10

4. Discussion

There have been few studies which estimated the awareness and prevalence of CBPP in Nigeria (Aliyu et al., 2000) and most of such reports were exclusively based on abattoir surveys with focus on mostly the north eastern part of the country (Aliyu et al., 2003); Bello and Ibrahim 2010; Tambuwal et al., 2011). The present field survey was aimed at assessing the awareness of CBPP in rural pastoral communities of Dutsinma region, Katsina state, Nigeria. More than 80% of cattle populations in Nigeria are owned by the Fulani herdsman whose herding practices and social dynamics are generally similar (Aliyu et al., 2000). However, in this survey, 74% of the cattle populations in Dutsinma LGA are owned by the agro pastoralists, 19% by nomadic pastoralists and 7% by daily

laborers. It is therefore likely that CBPP awareness does not have spatially significant distribution in the studied area. Similarly, in this survey, Karofi ward has the highest number of cattle with a sample herd size of 512 and mean herd size of 51 ± 34.2 while Dutsinma B has the least sample herd size of 143 and mean herd size of 14 ± 9.8 . This survey shows that 96% of the respondents agree that the disease is preventable and 47% responded that the disease can be prevented by vaccination. This finding is in accordance with the report of Thiaucourt et al. (2003) in which administration of live attenuated vaccine (T1/44) played a significant role in reducing the disease prevalence. In a questionnaire based survey in Sokoto and Kebbi states of north western Nigeria, Tambuwal et al. (2011) reported that 65% of herdsman were aware of the existence of CBPP outbreaks in the studied area. It is therefore likely that the higher the level of CBPP awareness by the pastoralists and herdsman, the more they accept and implement CBPP control options such as vaccinations which have been shown to effectively reduce the number of seropositive animals (Thiaucourt et al., 2003; Mariner et al., 2005).

Table 3.1.9
Herd size distribution by Ward.

Ward	Total Herd size	Mean range Herd size	Percent %,
Makera	148	15 ± 7.4	4.42
Dabawa	225	23 ± 14.6	6.72
Dutsinma A	247	25 ± 17.6	7.38
Dutsinma B	143	14 ± 9.8	4.27
Bagagadi	245	25 ± 23	7.32
Karofi A	362	36 ± 26	10.81
Karofi B	512	51 ± 34.2	15.29
Kuki A	438	44 ± 37.9	13.08
Kuki B	613	61 ± 32.8	18.31
shema	415	46 ± 27	12.40
Total	3348		100

Table 3.2
Dutsinma Hardo Contacts By Ward.

NAME	CONTACT	WARD
Alh. Abdu Garhi/ chairman Miyetti Allah	070-84745719	Kutawa
Alh. Abdullahi Makera/ Secretary Miyetti Allah	080-89129965	Dutsin-ma A
Alh. Kabiru shema/ardo shema ward	070-8371946	Shema
Alh. Audu filani/filani dabawa ward	070-34991579	Dabawa
Filani Bello/filani Karofi ward	070-36207108	Karofi B
Alh. Yunusa makera/ardo Hajiya Lami/ chairlady Miyetti	070-19751328 070-19779520	Makera Makera

Most of the pastoralists can only recognize signs such as coughing and labored breathing which are only evident during acute stage of the disease. Therefore, subclinical or chronic CBPP forms may likely have been passed unnoticed and thus unreported. This finding is in agreement with the report of Mtui-Malamsha (2009) where herdsman were unable to recognise subclinical CBPP even in an enzootic area.

The present study shows that CBPP level of awareness in Dutsinma region is significantly associated with risk factors ($p < 0.05$) describing aspects of livestock stocking density, herd type and location, climate change, sharing feed and water source, extensive grazing (Table 3.1.8) have been reported to determine CBPP distribution patterns

in many African Pastoral systems (Mariner et al., 2006). The study also shows that the level of awareness is not significantly associated with age of agro pastoralist ($p < 0.05$).

5. Conclusion

A total of 5,843 animals were vaccinated (prophylactic vaccination) in 2012 based on the NADIS record. No record of vaccination in 2013. However, based on the data from the sampled respondents, a total of 1748 of their animals were vaccinated during the 2012 CBPP campaign. This shows a difference of 4, 1095. No outbreak was recorded during the period of 2012. There is Data falsification and poor documentation as evident in the huge gap of the animals vaccinated between that of the clinic and the figures obtained from the field.

Majority of the cattle populations in Dutsinma LGA are owned by the agro pastoralists. There is excellent awareness that the disease is preventable and a significant number of the pastoralists opine that the best way of prevention is through vaccination. The survey also shows that the higher the level of CBPP awareness by the pastoralists and herdsman, the more they accept and implement CBPP control options such as vaccinations which have been shown to effectively reduce the number of seropositive animals.

Most of the pastoralists can only recognize signs such as coughing and labored breathing which are only evident during acute stage of the disease. Therefore, subclinical or chronic CBPP forms may likely have been passed unnoticed and thus unreported. The present study shows that CBPP level of awareness in Dutsinma region is significantly associated with risk factors such as livestock stocking density, herd type and location, climate change, sharing feed and water source and extensive grazing.

From the chi square test (λ^2) conducted, it shows that the value of calculated chi square ($|\lambda^2| = 2.23$) is less than the critical level (5.99) at $p < 0.05$. Hence, the null hypothesis (H_0) is accepted that the level of awareness is not significantly associated with age of agro pastoralist ($p < 0.05$).

Null hypothesis (H_0) - There is no significant difference between age of pastoralists and level of awareness about CBPP in Dutsin-Ma LGA, Katsina State.

6. Recommendation challenges and lessons

6.1. Recommendation

- 1) Public health sensitization campaigns should be intensified as poor information dissemination is likely to enhance the spread of CBPP and other livestock diseases.
- 2) More grazing and watering facilities for livestock production should be made available to cattle herdsman particularly in dry season when such points are few as this will reduce the frequency and duration of contacts between herds of different disease conditions.
- 3) The directorate of veterinary service, Katsina state should conduct refresher training for its technical staffs on adequate data documentation and management.
- 4) Provision of adequate Data tools to all veterinary clinics in the state by the state directorate of veterinary service.
- 5) Close supervision and monitoring by senior state officers during campaigns and routinely should be employed in order to checkmate issues data falsification and fabrication.
- 6) The state government should improve on CBPP immunization accessibility since there is high utilization of the vaccine by the pastoralists.
- 7) Interventions by way of support from local and international Non Governmental Organization (NGOs) are needed to strength livestock vaccination in the state.

6.2. Challenges

During the course of the field work, the following issues affected the progress of the exercise,

1. Insecurity – cattle rustlers causing insurgency and stealing livestock made accessibility to some areas difficult and especially kutawa ward which borders Safana LGA, Katsina State.
2. Tough terrain to pass through in order to get to some settlements/rugas (scattered, hard to reach and boarder settlements).

6.3. Lessons

1. Advocacy and involvement of the Miyetti Allah group helped in assessing the pastoralists and especially the Fulani settlements.
2. Use of local guide made identification of rugas less difficult and also in serving the questionnaires.
3. Use of local guide as an interpreter to serve the questionnaires and to get appropriate response.

Questionnaire

Questionnaire for assessment of awareness about CBPP in rural pastoral communities of DUTSINMA Region

Part I. Socio- demographic characteristics of the respondents

GPS Coordinates,

North _____ East _____

Ward _____

Ward id _____

Name of Ruga _____

Ruga id _____

Herd id _____ Herd size _____

Name of hardo/Fulani _____

Sex, a. Male b. Female

Age (Year), _____

4. Marital status a. Married b. single

5. Educational status, a. informal b. read & writes c. only read

6. Occupation, a. Nomadic pastoralist b. Agro-pastoralist c. Merchant d. Daily laborer e. other

(please specify) _____

7. Duration of residence in the area/village _____ (years)

Part ii. Questionnaire about knowledge of CBPP

1. Have any of your animals suffered from CBPP before (Huhu in Hausa language)

a. Yes b. No

2. If yes, what do you think about the cause of this disease? (**Do not read the alternatives but circle it if the respondent will mention it**)

a. Bacteria/germ b. cold c. shortage of food d. hot climate e. sun light f. any other _____

3. What is/are the common symptom (s) of CBPP?

4. Does this disease transmit from an animal to other animal?

a. Yes b. No c. Do not know

5. If yes, how can it be transmitted? (**Do not read the alternatives but circle it if the respondent will mention it**)

a. Through breathing/air

b. contact with wound or pus

c. Ingestion (sharing drinking /feeding materials with infected animal)

d. Any other _____

6. Do you think that the transmission of CBPP is preventable?

a. yes b. no c. do not know

7. If yes, preventive methods? (**Do not read the alternatives but circle it if the respondent will mention it**)

a. avoid sharing drinking /feeding materials with infected animal

b. avoid contact with new animals

c. vaccination

d. use separate place for infected animal (quarantine)

- e. any other _____
8. Does this disease have a treatment?
- a. Yes b. No c. Do not know
9. If yes, what is the effective treatment for CBPP?
- a. Traditional medicine
- b. Modern drug (orthodox)
- c. both
- d. do not know
10. If traditional medicine, what type of treatment is it?
- a. Medicinal plant (please specify) _____
- b. Food (please specify) _____
- c. any other _____

Part iii. Assessment of perception of pastoral communities about public health importance of CBPP

1. Is CBPP a major health problem in this area?

- a. Yes b. No c. don't know
2. If yes, since when did the disease become a health problem in this area?
- a. this year
- b. last year
- c. more than 2 years ago
- d. any other _____
3. If recent years, what factors do you think contributed to its expansion? (**Do not read the alternatives but circle it if the respondent will mention it**)
- a. stocking density/herd size
- b. herd type
- c. herd location
- d. climate change
- e. sharing feed and water source
- f. extensive grazing
- g. any other _____

If you have any other comments or suggestion (please write)

Thank you

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