



Participatory appraisal of Foot and Mouth disease outbreaks in Ilesha Baruba, Kwara state-Nigeria

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Key

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ABSTRACT:

Appraisal of foot and mouth disease (FMD) outbreaks in Ilesha baruba LGA, Kwara state in Nigeria was conducted to establish the knowledge, attitude and management control system practiced by the Fulani herdsmen. Participatory appraisal approach using designed questions in an open ended interview with the herdsmen during outbreak investigation in December, 2010, January, February, and March, 2011 was employed. Overall Morbidity, Mortality and Case fatality rates of 19.82%, 0.92% and 4.63% respectively was recorded in fifteen outbreaks investigated. Semi nomadic husbandry management system characterized by no history of FMD vaccination was mostly practiced in the affected herds. Yakana (white Fulani) and Bokoloji breeds were the most affected manifesting with very severe forms of clinical signs. Common source of water points predisposed these in-contact cattle with other herds, sheep, goats and donkeys but not wildlife. Response of the Fulani herdsmen showed all can recognize FMD and that all ages, sex, breeds of cattle could be affected by the disease except donkeys. No particular season was associated with FMD occurrence. It was also gathered that some herdsmen use local herbs and drug medication. Inadequate veterinary service which compels them to engage a few common service providers was emphasized by the herdsmen. Finally, non treatable cattle are usually sold to butchers for human consumption at a reduce market value as death of affected cattle was usually avoided. All responses were independent and statistically significant by chi square ($P < 0.05$). This finding confirmed that FMD is a serious problem amongst the Fulani livestock pastoralist which requires a proactive intervention plan.

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1. INTRODUCTION

Foot and mouth disease (FMD), is a highly contagious viral trans-boundary disease of both domestic and wild cloven hoofed animals characterized by high morbidity and decreased livestock productivity, while affected countries are being excluded from international animal trade (Domingo *et al.*, 2002). The epidemiology of FMD on the African continent is influenced by two different patterns, which include a cycle that

wildlife plays a role in maintaining and spread of the disease to other susceptible domestic animals and wild ungulates as well as the cycle that is maintained within domestic animals independent of the wildlife (Vosloo *et al.*, 2002). In Nigeria, in spite of the annual disease burden, extensive studies on FMD infections and outbreaks are inadequate due to poor understanding of the epidemiology of the disease. Hence, occurrence and distribution pattern of the disease still remains unexploited and poorly understood

(Olabode, 2012). Participatory Epidemiology (PE) is the use of community-based participatory approaches and methods to collect detailed information, in order to improve the understanding of animal diseases and veterinary services. This helps to design solutions for disease problems of livestock keepers, through analysis and use of data gathered during epidemiological research and disease surveillance (Jost et al., 2007). This PE evolved in the early 1990s (Thrusfield, 2005) which overcomes many of the limitations of conventional epidemiological methods to assist successful livestock health project intervention that is based upon intimate knowledge of local conditions obtained from first hand animal handlers at village (community) level assessment (Johnston and Clark, 1982). Community knowledge related to animal health has been termed *existing veterinary knowledge* which has made important contributions to Western medicine (FAO, 2011). The approach was developed in small-scale, community animal health programmes and then applied to major international disease control efforts. The Global Rinderpest Eradication Program adopted participatory epidemiology as a surveillance tool for controlling rinderpest. This approach was subsequently used in both rural and urban settings in Africa and Asia, for foot and mouth disease, peste des petits ruminants and highly pathogenic avian influenza as well as controlling both rare and common diseases (Jost et al., 2007). Based on its use as participatory techniques for the harvesting of qualitative epidemiological intelligence contained within community observations, existing veterinary knowledge and traditional oral history which is dependent on the widely accepted techniques of participatory rural appraisal, ethno-veterinary surveys and qualitative epidemiology (Schwabe, 1984) and the obtained information have been used to design better animal health projects and delivery systems, more successful surveillance and control strategies or as new perspectives for innovative research hypotheses in ecological epidemiology. Therefore, this study seeks to appraise the

outbreaks of FMD in Ilesha baruba LGA in kwara state through a participatory approach using designed questions in open ended interviews with Fulani herdsmen in accordance to the term of reference as agreed by the authors. This will contribute in providing robust FMD control strategy in this Nigerian border town with Benin Republic.

2. MATERIAL AND METHODS

2.1 Study Area

Ilesha Baruba is a major town and district in Baruteen Local Government Area of kwara state (Anon, 2011), where the Cattle International market is located, for the sales and distribution of cattle from Mali, Togo, Benin, Cote de voire/Burkina Faso and Senegal to other parts of Nigeria. Baruteen Local Government Area is uniquely located to the North western part of kwara state in Nigeria, which shares boundaries in the West with Benin Republic, in the South with Irepo Local Government Area of Oyo State, in the North with Babana district in Borgu LGA of Niger State and in the East by Kaiama LGA of Kwara State (Akande and Monehin, 2004). The road distance from Kosubosu (LGA headquarters) in Yashikira district to Ilorin (administrative division) about is 503km this facilitate human and livestock traffic. They people mainly engage in agricultural and livestock keeping and trading activities with Batonu being the major language, but Hausa, Fulani and Yoruba and Bokobaru are also spoken in the area (Anon, 2011).

2.2 Material

2.2.1 Questionnaire

Questions were designed and structured in accordance with the terms of reference of this study, (knowledge, attitude and management practices of FMD by Fulani herdsmen) which included husbandry management system, history of FMD vaccination, history of recent introduction, source of water, season of occurrence, recognition of FMD, breed, age and sex affected, medication, availability of veterinary services and management of sick and moribund animals and any other comments or observation by the authors.

2.3 Method

2.3.1 Epidemiological data:

General herd health information was documented for each herd. This notably included the total number of cattle in each herd, total number sick and the total number of death encountered during each FMD outbreak. This documentation preceded the commencement of interview interactions with the Fulani herders.

2.3.2 Participatory approach:

Participatory appraisal approach using designed interview questions in accordance with the term of reference as agreed by the authors and described by (McCracken, 1988) was adopted. Personal observations by the authors and open ended interviews and discussions with the Fulani herdsmen during outbreak investigation in December, 2010, January, February, and March, 2011 was documented and analyzed.

2.4 Statistical analysis:

The data obtained during this survey was subjected simple descriptive statistics (percentage) and the appraisal responses to chi square [SPSS]

3. RESULT AND DISCUSSION

Out of the total of 4,248 cattle at risk during the period under review in the study area, 842 were clinically affected and 39 calf deaths was recorded with morbidity, mortality and case fatality rates of 19.82%, 0.92% and 4.63% respectively. This outbreaks report connotes the occurrence of FMD as previously documented Abdulkadir, (1989); Durojaiye, (1981); Abegunde, (1987); and Chukwuedo, et al., (2003). The validation of the Fulani herdsmen's knowledge on the identification, attitude and management practices of FMD using semi structured interviews during outbreaks investigations revealed that all responses were independent and statistically significant by chi square ($P < 0.05$) [SPSS]. These fifteen (15) outbreaks in Fulani herds revealed Yakana (white Fulani) and Bokoloji breeds were mostly affected with FMD, manifesting very

severe forms of the clinical signs. Other reported in-contact animals within the herds include sheep, goats and donkeys. The husbandry management mostly practiced in herds involved was semi nomadic with no history of FMD vaccination in all affected herds, this agreed with reports of Megersa et al., (2009); Ishola et al., (2011) which states that FMD occur in both extensive and intensive management system but more associated with extensively managed herd system. The cattle in this area usually graze around the neighboring settlement (Bode) during the dry season and Mosi Korfar during the wet season while some herds do graze out during the rainy season. However, some of the herdsmen vaccinate their cattle against other reported diseases such as Hemorrhagic Septicemia (Pasturellosis) (Sugun et al., 2013), Contagious Bovine Pleuro-Pneumonia (CBPP) (Adamu, and Aliyu, (2006), Black leg (Sugun et al., 2007) and a times Brucellosis (Cadumus et al., 2006). Investigation as regards the source of water revealed rivers Yepti and Janburku /Iasa as well as the available streams and water bodies which might have predisposed these cattle to have contact with other herds but not with wildlife in spite of previous reports (Vosloo et al., 2002) of wildlife involvement in the epidemiology of FMD in African. In depth discussion with all the herdsmen involved revealed no history of recent introduction of animals and or distant migration but the trade cattle route (Paraku - Ilesha) proximity to Baukaru rontuwa district may be an associated predisposing factor. Further discussion with the Fulani herdsmen on their knowledge of the disease showed all can recognize FMD and some of them mentioned signs` such as loss of hair around the horns, swelling of the upper regions of the hoof which later results into wounds, other responded that lesions on the muzzle and tongue as well as salivation as common signs.

Table 1: Foot and Mouth Disease Outbreaks in Ilesha Baruba LGA in Kwara state

Outbreaks	Location (Wards)	Total No. of animals	No. Sick	No. of death calves	Morbidity (%)	Mortality (%)	Case fatality rate (%)
1	Bode II	300	50	3	16.67	1.00	6.00
2	Bode I	380	60	5	15.78	1.31	8.33
3	Bode I	78	22	1	28.20	1.28	4.54
4	Bode II	220	80	3	36.36	1.36	3.75
5	Bode II	300	100	3	33.33	1.00	3.00
6	Bode II	260	60	2	23.07	0.76	3.33
7	Bukaru- Rontuwa	450	100	4	22.22	0.88	4.00
8	Bode I	200	40	2	20.00	1.00	5.00
9	Bode II	250	70	2	28.00	0.80	2.85
10	Bode II	350	80	4	22.85	1.14	5.00
11	Bukaru-Rontuwa	150	30	1	20.00	0.66	3.33
12	Bukaru- Rontuwa	450	60	3	13.33	0.66	5.00
13	Bode I	200	20	2	10.00	1.00	10.00
14	Bode I	280	50	1	17.85	0.35	2.00
15	Bode I	380	20	3	5.26	0.78	15.00
Total		4,248	842	39	19.82	0.92	4.63

This signs connotes earlier reports (Kitching, 2002). Significant number of the herdsmen reported that all ages, sex, breeds of cattle could be affected by the disease. This connotes reports of Ishola et al., (2011) Mekonen et al., (2011) and Olabode et al., (2013) expect donkeys as responded by the herdsmen. No particular season was associated with disease occurrence in this study as it also agreed with report of Abdulkadir, (1989) in Nigeria and Rufael et al., (2008) in Ethiopia which stated disease occurrence in both dry and wet season but attributed increased stress and cattle movement to dry season. It was also gathered that some herdsmen use local herbs, drug medication (Penicillin) as they lamented that their accessibility to veterinary services which compels them to engage a common service provider (Area livestock superintendent). The insufficient FMD vaccination due to unavailability and or high cost of the limited imported FMD vaccines was also emphasized by the herdsmen. Finally, when the animal fails to respond to treatment the herdsmen sale them to the butchers for human consumption at a reduce

market value as death of affected cattle is usually avoided, hence uncommon. This connotes previous reports that mortality associated with FMD is usually low, but the disease decreases livestock productivity (Domingo et al., 2002) with serious impact on social and economic consequences of reduced milk and meat production as result of high morbidity and loss of market value (Sangare et al., 2004).

In conclusion, participatory appraisal of the local exiting veterinary knowledge of the Fulani herdsmen is robust and revealed that FMD is still a serious problem amongst the Fulani livestock pastoralist. This information can therefore be used as a baseline for the design of FMD control strategy in this study area which is a Nigeria-Benin republic border town. Biosecurity awareness campaign amongst Fulani herdsmen should be organized to ensure early detection and disease reporting as well as recruiting more veterinary personnel empowered with field strain matching FMD vaccines for vaccination is also advocated.

Table 2: FMD appraisal responses from the Fulani herdsmen in Ilesha Baruba, Kwara state

Variable	Category	No. examined	Response	X ²	P-value	95% CI	
Husbandry	Semi nomadic	15	12	14.8	0.001	-10.11 to 20.11	
	Intensive		1				
	Extensive		2				
History of FMD vaccination	Yes	15	1	11.2667	0.001	-75.09 to 90.09	
	No		14				
History of FMD vaccination against other diseases (BQ, HS, Brucella)	Yes	15	15	15	0.00	-87.80 to 102.80	
	No		0				
History of recent introduction of animals	Yes	15	2	8.06667	0.005	-62.38 to 77.38	
	No		13				
Type of in-contact animal	Sheep, goat donkey	15	15	30	0.00	-16.51 to 26.51	
			None				0
							0
Contact with wildlife	Yes	15	0	15	0.00	-87.80 to 102.80	
	No		15				
Source of water	River Yepti	15	8	0.0667	0.796	1.147 - 13.853	
	Janburku /Iasa		7				
Location of grazing (dry)	Within the neighborhood	15	15				
Location of grazing (wet)	Kofar Morsi	15	12	5.4	0.02	-49.68 to 64.68	
	Distant migration		3				
Season of FMD occurrence	Dry	15	8	0.0667	0.796	1.147 - 13.853	
	Wet		7				
Recognition of FMD	Yes	15	15	15	0.00	-87.80 to 102.80	
	No		0				
Some signs mentioned	Mouth Lesions	15	2	7.6	0.022	-5.83 to 15.83	
	Foot lesions		3				
	Both		10				
Cattle breed affected by FMD	Yakana	15	0	30	0.00	-16.51 to 26.51	
	Bokoloji		0				
	All breed		15				
Age affected by FMD	Young Adult	15	15	30	0.00	-16.51 to 26.51	
							0
							15
Sex affected by FMD	Female	15	15	30	0.00	-16.51 to 26.51	
	Male		0				
Availability of Veterinary service	Yes	15	4	3.267	0.071	-36.97 to 51.97	
	No		11				
Medication	Drugs (Penicillin) Herbs	15	9	0.6	0.439	-11.56 to 26.56	
							6
							0
Management of sick/ moribund animals	Sales	15	15	30	0.00	-16.51 to 26.51	
	Death		0				

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