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# EFFECTS OF EBOLA (EVD) OUTBREAK ON BUSH MEAT MARKETING AND CONSUMPTION IN IBARAPA CENTRAL LOCAL GOVERNMENT AREA OF OYO STATE, NIGERIA

Oyediran, W. O.<sup>1†</sup> --- Omoare, A. M.<sup>2</sup> --- Esenwa, A. O.<sup>3</sup> --- Omisore, O. A.<sup>4</sup> --- Dick T. T.<sup>5</sup>

<sup>1,5</sup>Department of Agricultural Extension and Rural Development, Federal University of Agriculture, Abeokuta, Ogun State, Nigeria

<sup>2</sup>Department of Agricultural Education, Federal College of Education, Abeokuta, Ogun State, Nigeria

<sup>3</sup>Department of Agricultural Extension and Farm Management, Oyo State College of Agriculture, Igboora, Oyo State, Nigeria

<sup>4</sup>Rokupr Agriculture Rice Centre (RARC), Sierra Leone Agricultural Research Institute (SLARI)

## ABSTRACT

Ebola Virus Disease (EVD) outbreak was a major threat to public health in Nigeria and it adversely affected the people's perception on bush meat as it was revealed that wild animals were host of the virus. Thus, the study assessed the effects of EVD outbreak on bush meat marketing and consumption in Ibarapa Central Local Government Area of Oyo State, Nigeria. Multi stage sampling technique was used to select 85 respondents. Data collected with interview guide and analysed using with descriptive statistics and chi-square analysis. The results showed that 58.80% of the respondents were between 40 – 50 years of age and 73% of the respondents were females. Majority (64.70%) of the respondents had been in bush meat business for more than 10 years. Before the EVD outbreak 37.14% of the respondents had more than 50 customers while patronage reduced to less than 25 customers in a day after EVD outbreak. Similarly, 42% of respondents had more than ₦21,000.00 in a day before EVD outbreak as against less than ₦5,000.00 in a day after the outbreak. Chi-square analysis showed a significant relationship between the sources of information on EVD outbreak and bush meat sales at  $p < 0.05$ . It can be concluded that EVD caused reduction in the customers' patronage and income realized from the sales of bush meat after the outbreak. It is hereby recommended that more awareness should be created by government and other stakeholders that Nigeria is free of EVD, and bush meat is safe for public consumption while Agricultural Extension Agents and Community Health Workers should focus on training and capacity building for quality and healthy bush meat business in the study area.

**Keywords:** Ebola virus disease, Effects, Outbreak, Bush meat, Marketing, Consumption.

## Contribution/ Originality

This study is one of very few studies which have investigated the setback caused by the spread of the news of Ebola virus disease outbreak on bush meat sales and consumption in rural communities where cases of Ebola disease virus were not actually reported.

## 1. INTRODUCTION

In West Africa, bush meat is an ancient tradition in proper nutrition because the livestock production is low. People often consume bush meat as European societies eat rabbit or deer meat. The term bush meat can be referred to as meat from animals in the wild that can be obtained from mammals, reptiles, amphibians, and birds hunted for food in the forests [1]. Hunting of these animals in the wild can as well serve as entertaining game. Bush meat is eating as protein source and sustenance in rural areas, while major towns and cities treated bush meat as a delicacy in their diets [2]. In recent time, it is commonly referred to as meat of terrestrial wild killed for home consumption or commercial purposes in Africa and developed countries. However, bush meat is a vector of some serious tropical diseases spread to human [3, 4], for instance Ebola Virus Disease (EVD). The Ebola virus, for which the primary host has been identified as fruit bats, is a major concern in bush meat consumption and public health. Primates which have been suspected to be an intermediate host may carry the disease, after contracted the disease from bat droppings or remnants of fruits ate by the bats. This is very dangerous for the primates [2] as it can be transmitted to man through contact. The largest outbreak happened in 2014 and it was originated from south-eastern Guineas which later spread to some West African countries such as Sierra Leone, Congo, Liberia and Nigeria. However, Ghana where large quantity of bats are being hunted, consumed and sold to public recorded no case of Ebola outbreak [2]. People sometimes get Ebola infection directly from bats due to poor cooking practices. In most cases, the hunters, marketers, food vendors and consumers are at the receiving end. The hunters used different skills and tools to capture the bats which can make them have contact with the blood of the bats or get bitten by the bats and consequently infected with Ebola virus (EVD). Marketers and processors also do have direct contact while handling bush meat. Before the EVD outbreak in year 2014 the hunters, processors, marketers, and consumers were not aware of the risks associated with handling bush meat; it is generally considered as healthy food. In Nigeria in particular, there was no public awareness and enlightenment campaign on EVD not until after the outbreak. Since July 20, 2014 when the late American-Liberian diplomat, Patrick Sawyer, sauntered into Lagos heavily infected with the Ebola Virus Disease (EVD), Nigerians have known no peace [5]; eight (8) people out of twenty (20) cases of EVD victims were dead. There have been changes in almost every sphere of living. The public are panicking and restraining themselves from eating bush meat such as bats, monkeys and even to the detriment of other animals. As part of government measures to wage war against EVD there were jingles in the media (radio, television, newspapers, Internet etc.) that people should stop eating bush meat. The news of EVD spread like wild fire. Also, medical experts, quarantine officers and other stakeholders unanimously joined government to eradicate EVD in the country. Nigeria government has however not encouraged the public to consume the bush meat since the country has overcome the EVD and declared as EVD free by the World Health Organisation (WHO). Consequently, hunters, bush meat sellers and restaurants are not only counting their losses but gradually fading out of the bush meat business. Thus, this study finds it important to assess effects of Ebola Virus Disease (EVD) outbreak on bush meat marketing and consumption in Ibarapa Central Local Government Area of Oyo State, Nigeria.

### 1.1. Specific Objectives Were to

- i. ascertain socio-economic characteristics of respondents in the study area;
- ii. sources of information on the EVD outbreak to the respondents in the study area;
- iii. examine patronage before and after the outbreak in the study area;
- iv. estimate sales before and after the outbreak in the study area;
- v. assess coping strategies by the respondents in the study area;
- vi. identify challenges to bush meat business in the study area.

### 1.2. Hypotheses

H<sub>01</sub>: There is no significant association between the sources of EVD news spread and bush meat patronage in the study area.

H<sub>02</sub>: There is no significant association between the sources of EVD news spread and bush meat sold in the study area.

## 2. MATERIALS AND METHODS

The study was carried out in Ibarapa Central Local Government Area of Oyo State, Nigeria. Ibarapa Central LGA has an area of 440 km<sup>2</sup> and a population of 102,979 [6]. The LGA has good vegetation and landscape that are conducive for wild animals to survive and multiply. Hunters are prominent in every household within a large extended family compound. Dry season is a hunting festival as hunters move in group from one forest to another on daily basis; it is entertaining as hunters display skills to capture preys. Bush meat marketing and food vendors are very popular in the study area. There are seven major markets in the LGA and each of the markets there is always a section where bush meat from diverse animals is being displayed for sales. Similarly, every food vendors offer good and delicious bush meat for customers at a cheaper price compared to the cities. Multi stage sampling technique was used in selecting respondents for this study. There are ten wards in Ibarapa Central Local Government Area. Five wards were randomly selected (Oke-Iserin, Isale-Oba, Saganun/Idofin, Pako/Igbole and Idere). The second stage was random selection of seven bush meat sellers and ten food vendors from each of the selected wards making a total of 85 respondents for this study.

The instrument used for the data collection was subjected to face validity by consulting experts in the field of Agricultural Extension and Rural Development. Items found ambiguous were removed. Test-retest was carried out with ten bush meat sellers in Igangan town to ascertain the reliability of the instrument. A reliability coefficient of 0.77 was obtained. Since the reliability coefficient of 0.75 and above is termed reliable, it is assumed that the instrument used for this study was reliable. Data collected from this study were subjected to both descriptive statistics such as percentage, mean score and frequency distribution.

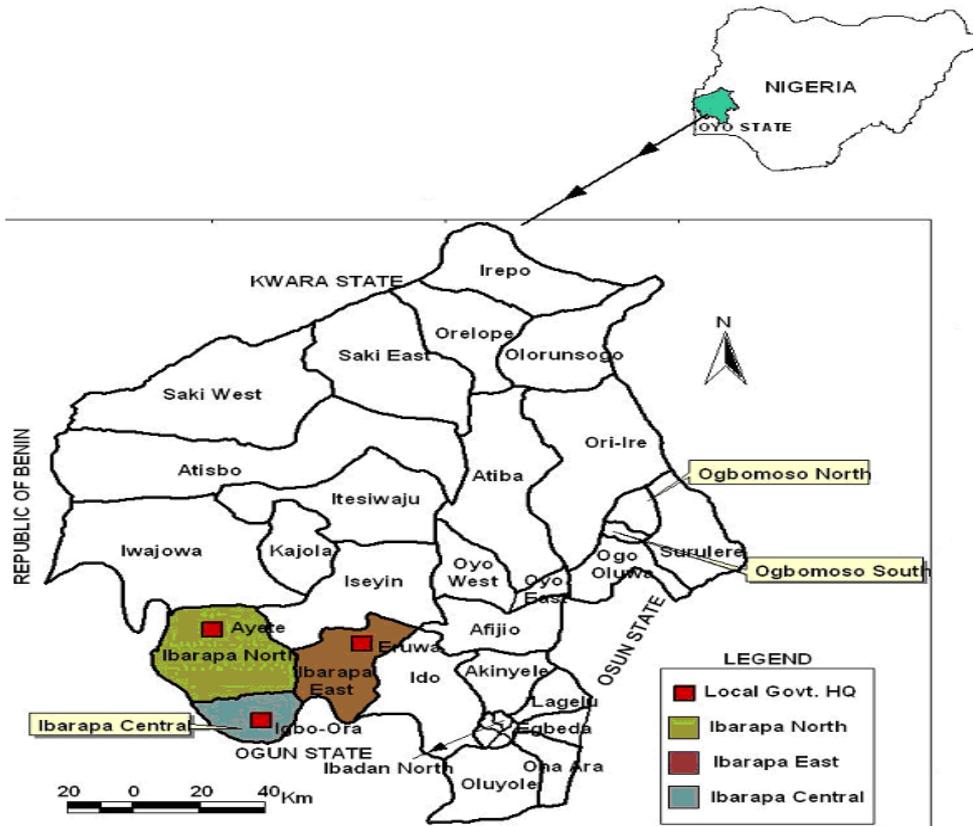


Figure-1. Map of Oyo State showing Ibarapa Central Local Government Area

### 3. RESULTS AND DISCUSSION

#### 3.1. Socio-Economic Characteristics of Respondents

The results in Table 1 showed that majority of the respondents (58.80%) were between 40 – 50 years of age while 21.20% of the respondents were above 50 years. About 64% of the food vendors and 51.40% of bush meat sellers were within this age bracket. It implies that the respondents in the study area are economically active. Majority (73%) of the respondents were females while 27% were males. The result indicates the dominance of female in bush meat business in the study area. However, 65.70% of bush meat sellers were males. This is possible because the hunters sometimes sell the captured animals directly to the consumers or hand it over to their counterparts in the markets to help sell it. Similarly, women (100%) were actively involved in food vending. Traditionally, women do most food preparation and cooking in Africa. Most of the respondents (82.35%) were married while some of the respondents (17.65%) were separated. None of the respondents was single. This may be due to the fact that they are all adults and economically empowered. The results also revealed that 47.10% of the respondents had 6 -10 people in their households while 49.40% of the respondents had more than 10 people. The reason for this could be as a result of the fact that bush meat business requires more hands in processing, cooking and marketing especially in food vending where there may be too much customers to attend to at a time. Most (64.70%) of the respondents had been in bush meat business (direct selling/food vending) for more than 10 years while 23.60% of the respondents had spent 6 – 10

years. The respondents are full of experience due to the long staying in bush meat buying, preparation and selling. 45.90% of the respondents attended secondary school while 2.30% of the respondents went to tertiary institution. It shows that the bush meat sellers and food vendors have certain level of formal education that can help them in their bush meat business venture in the study area.

**Table-1.** Socio-economic characteristics of respondents (n = 85)

Variables	Bush meat sellers (n = 35)	Food vendors (n=50)	Total (n = 85)
Age (years)			
≤ 30	0 (0.00)	02 (4.00)	02 (2.40)
31 – 40	09 (25.70)	06 (12.00)	15 (17.60)
40 – 50	18 (51.40)	32 (64.00)	50 (58.80)
> 50	08 (22.90)	10 (20.00)	18 (21.20)
Sex			
Male	23 (65.70)	0 (0.00)	23 (27.00)
Female	12 (24.30)	50 (100)	62 (73.00)
Marital status			
Single	0 (0.00)	0 (0.00)	0 (0.00)
Married	32 (91.40)	38 (76.00)	70 (82.35)
Separated	3 (8.60)	12 (24.00)	15 (17.65)
Household size(no. of people)			
≤ 5	03 (8.60)	0 (0.00)	03 (3.50)
6 – 10	26 (32.50)	14 (28.00)	40 (47.00)
> 10	06 (17.10)	36 (72.00)	42 (49.40)
Years of experience (years)			
≤ 5	04 (11.40)	06 (12.00)	10 (11.70)
6 – 10	07 (1.75)	13 (26.00)	20 (23.60)
> 10	24 (28.30)	31 (62.00)	55 (64.70)
Educational status ( school level)			
No formal education	21 (60.00)	04 (8.00)	25 (29.40)
Primary education	09 (25.70)	10 (20.00)	19 (22.40)
Secondary education	05 (14.30)	34 (68.00)	39 (45.90)
Tertiary education	0 (0.00)	02 (4.00)	02 (2.30)

Source: Field survey, 2014  
Values in brackets are percentages

### 3.2. Sources of the Information on EVD Outbreak

The results in figure 2 showed that all (100%) the respondents received the information on EVD outbreak through radio broadcast while 81.20% of the respondents got it from friends and family, and 65.90% of the respondents viewed it in the television. This is in line with the findings of Lawal [7], that radio is still ‘a means of disseminating agricultural information to farmers in developing countries because it is widely accessible to rural dwellers. Meanwhile agricultural extension agents (4.70%) and newspapers (8.20%) were not effective in spreading the EVD news to rural dwellers. The low participation of extension agents in EVD awareness may be as a result of low coverage due to staff shortage and poor funding of the sector. Community health workers

however passed the information to the people (28.20%) in the study area. This implies that the respondents and people have access to information on EVD through many channels.

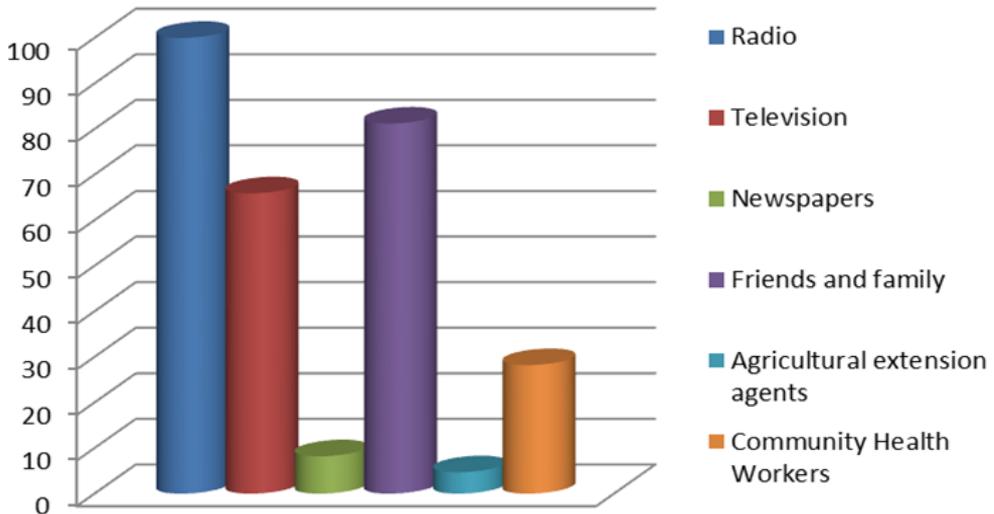


Figure-2. Distribution of respondents based on sources of the information on EVD outbreak

### 3.3. Customers’ Patronage of Bush Meat

The results revealed that before the EVD outbreak, 62.90% of bush meat sellers had 25 – 50 customers patronizing the bush meat while 37.14% of bush meat sellers had recorded more than 50 patronages in a day in the study area. Whereas after the outbreak none of the bush meat sellers had up to 51 customers in a day, just only 20% of the bush meat sellers had 25 – 50 customers and 80% of bush meat sellers had less than 25 customers in a day. In a similar vein, before the EVD outbreak the patronage of food vendors was very high (82%) and a few food vendors (8%) even had more than 100 customers in day. On the other hand, the food vendors did not get up to 51 and above patronage immediately the EVD struck the nation and the news was spread to the study area. 74% of the food vendors however had less than 25 customers and 26% of the food vendors had 25 – 50 customers at most in a day. This implies that patronage of bush meat reduces due to EVD outbreak and it has influence on the quantity of bush meat sold and livelihood of the respondents and their households.

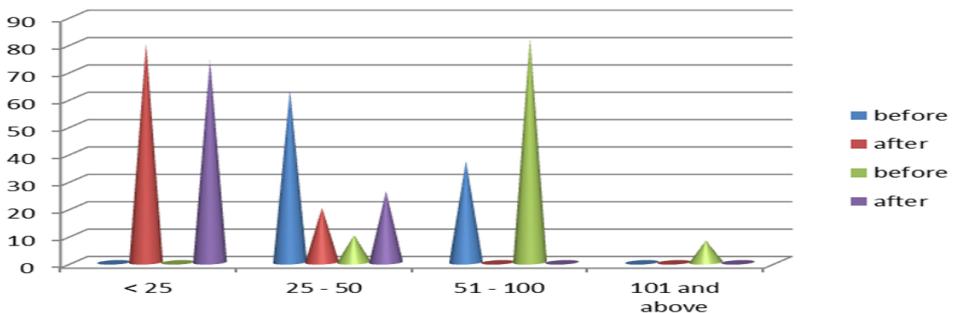


Figure-3. Distribution of respondents based on customers’ patronage of bush meat

Source: Field survey, 2014

### 3.4. Bush Meat Sales

The results in figure 4 showed that before the EVD outbreak 54.30% of bush meat sellers realized ₦11,000.00 – ₦20,000.00 and more per day as against 34.30% of bush meat sellers that got ₦5,000.00 – ₦10,000.00 and less after the EVD outbreak. Also, 42% of food vendors had more than ₦21,000.00 in a day before EVD outbreak as against 78% of the food vendors that got less than ₦5,000.00 per day. The results indicate high proportion decline in sales of bush meat as a result of EVD outbreak in Nigeria despite the fact that no victim of EVD was recorded in the study area. It means that people in the study area restrained themselves from eating bush meat which forms major part of their diets at home, food vendors and ceremonial parties as a result of information passed across in the various communication media to control EVD spread in Nigeria. In line with this finding is a comment of a bush meat seller in Ondo State, Nigeria that “I am married and have five children in higher institutions. I have been in this business for 30 years and have been taking care of my children through this business. I was able to build a house while doing this business. But ever since this Ebola issue started, the business has not been the same. Before the Ebola issue started, I used to make sales of about ₦100,000.00 daily but now, I hardly make ₦3,000.00” [5].

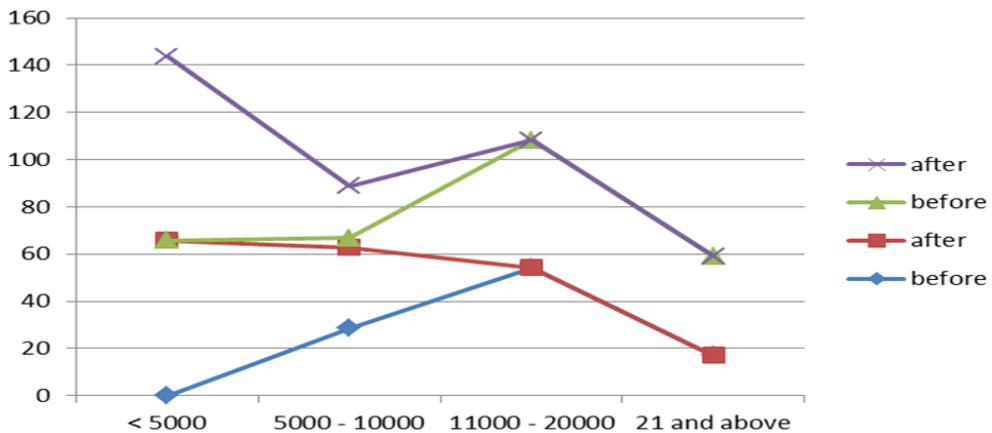


Figure-4. Distribution of respondents based on bush meat sold

Source: Field survey, 2014

### 3.5. Coping Strategies by the Respondents

The results revealed that majority of the respondents adjusted to the effect of EVD outbreak on the patronage and sales by increasing the quantity of beef that were prepared for the customers with mean score of 2.29. The second prominent coping strategy adopted by the respondents was the replacement of bush meat with catfish (*eja tutu/eja odo*) ( $\bar{X} = 2.00$ ) to cushion the effect of decline in bush meat demand. Also, respondents shifted to goat meat (*ogunfe*) ( $\bar{X} = 2.06$ ) in order to retain their customers and to get more income. Some of the respondents adopted the cooking of frozen turkey for their customers ( $\bar{X} = 1.91$ ) while majority of the respondents extended the closing time ( $\bar{X} = 1.42$ ) to allow for more customers that will come for food at night most especially the travellers. Other coping strategies adopted were selling of dried and roasted catfish ( $\bar{X} = 1.19$ ) and charcoal business ( $\bar{X} = 1.10$ ).

**Table-2.** Distribution based on the coping strategies of the respondents (n = 85)

Coping strategies	Regularly	Occasionally	Never	$\bar{x}$	Rank
Diversification into charcoal business	0(0.00)	09 (10.60)	76 (89.40)	1.10	7 <sup>th</sup>
Replacement of bush meat with cat fish ( <i>oja tutu</i> )	44 (51.80)	02 (2.30)	39 (45.90)	2.06	2 <sup>nd</sup>
Shifted to goat meat ( <i>ogunfe</i> ) as alternative to bush meat	36 (42.30)	13 (15.30)	36 (42.40)	2.00	3 <sup>rd</sup>
Cooking of frozen turkey for the customers	28 (32.90)	21 (24.70)	36 (42.40)	1.91	4 <sup>th</sup>
Increased quantity of beef meat	47 (55.30)	16 (18.80)	22 (25.90)	2.29	1 <sup>st</sup>
Moved into dried and roasted cat fish marketing	06 (7.10)	04 (4.70)	75 (88.20)	1.19	6 <sup>th</sup>
Extension of closing time from 9.00p.m. – 10.00p.m.	12 (14.10)	12 (14.10)	61 (71.80)	1.42	5 <sup>th</sup>

Source: Field survey, 2014  
 Values in parenthesis are percentages

### 3.6. Challenges to Bush Meat Marketing

There are many challenges confronting bush meat business in the study area. Most of the respondents (96.50%) indicated that epileptic electricity supply is a major problem in the study area. Irregular power supply is national problem in and it affects all sectors in Nigeria. Above ninety percent (92.90%) of the respondents also indicated that lack of training and capacity building on improved food handling and hygiene affected their food vending business. Some other problems that inhibited bush meat business were high cost of fuel wood (87.10%), high cost of food ingredients (85.90%) and poor transportation system (82.40%). Similarly, lack of storage facilities (71.80%) and portable water supply (70.60%) were impediments to bush meat marketing and food vending in the study area.

**Table-3.** Challenges to bush meat marketing and consumption (n = 85)

Challenges	Frequency	Percentage	Rank
Lack of training and capacity building	79	92.90	2 <sup>nd</sup>
Epileptic power supply	82	96.50	1 <sup>st</sup>
High cost of fuel wood	74	87.10	3 <sup>rd</sup>
High cost of food ingredients	73	85.90	4 <sup>th</sup>
Poor transportation system	70	82.40	5 <sup>th</sup>
Lack of storage facilities (e.g. electric oven)	61	71.80	6 <sup>th</sup>
Lack of clean and portable water	60	70.60	7 <sup>th</sup>

Source: Field survey, 2014  
 \*Multiple responses recorded

### 3.7. Hypotheses Testing

#### 3.7.1. Test of Association between Sources of EVD News and Bush Meat Patronage

There is no significant association between the sources of EVD news spread and bush meat patronage in the study area. The result of chi-square analysis showed a significant relationship between radio ( $\chi^2 = 4.20$ , df = 1, p = 0.04), television ( $\chi^2 = 34.90$ , df = 1, p = 0.00), newspapers ( $\chi^2 = 9.70$ , df = 1, p = 0.01), friends and family ( $\chi^2 = 8.94$ , df = 1, p = 0.03), community health workers ( $\chi^2 = 40.23$ , df = 1, p = 0.00) and bush meat patronage at p < 0.05 level of significance. It could be inferred from the results of this study that the news of EVD outbreak reached the Nigerians from diverse media and consequently restrict the populace from touching or eating wild animals. However,

agricultural extension agents ( $\chi^2 = 0.69$ ,  $df = 1$ ,  $p = 0.41$ ) were not significant to the bush meat patronage at  $p < 0.05$  level of significance. Therefore, the null hypothesis that “*there is no significant association between the sources of EVD news spread and bush meat patronage*” is rejected.

**Table-4.** Test of association between sources of EVD news spread and bush meat patronage

Variables	$\chi^2$	df	p-value	Decision
Radio	4.20	1	0.04	S
Television	34.90	1	0.00	S
Newspapers	9.70	1	0.01	S
Friends and family	8.94	1	0.03	S
Agricultural Extension Agent	0.69	1	0.41	NS
Community Health Workers	40.23	1	0.00	S

Source: Field survey, 2014  
S – Significant at  $p < 0.04$

### 3.7.2. Test of Association between Sources of EVD News and Bush Meat Patronage

*There is no significant association between the sources of EVD news spread and bush meat sold in the study area.* The result of chi-square analysis in Table 5 showed a significant relationship between radio ( $\chi^2 = 6.44$ ,  $df = 1$ ,  $p = 0.01$ ), television ( $\chi^2 = 27.26$ ,  $df = 1$ ,  $p = 0.00$ ), newspapers ( $\chi^2 = 46.20$ ,  $df = 1$ ,  $p = 0.00$ ), friends and family ( $\chi^2 = 10.50$ ,  $df = 1$ ,  $p = 0.01$ ), community health workers ( $\chi^2 = 51.47$ ,  $df = 1$ ,  $p = 0.00$ ) and bush meat patronage at  $p < 0.05$  level of significance. The results indicate that sources of information on EVD outbreak greatly affect the income realized from quantity of bush meat sold. It is very possible because the more the public are getting the jingles on EVD the more they are scared and reject bush meat. Meanwhile, agricultural extension agents ( $\chi^2 = 0.21$ ,  $df = 1$ ,  $p = 0.65$ ) were not significant to the bush meat sales at  $p < 0.05$  level of significance. Hence, the null hypothesis that “*there is no significant association between the sources of EVD news spread and bush meat sold*” is rejected.

**Table-5.** Test of association between sources of EVD news spread and bush meat sales

Variables	$\chi^2$	Df	p-value	Decision
Radio	6.44	1	0.01	S
Television	27.26	1	0.00	S
Newspapers	46.20	1	0.00	S
Friends and family	10.50	1	0.01	S
Agricultural Extension Agent	0.21	1	0.65	NS
Community Health Workers	51.47	1	0.00	S

Source: Field survey, 2014  
S – Significant at  $p < 0.04$

## 4. CONCLUSION AND RECOMMENDATIONS

From the findings of this study, it has shown that EVD caused reduction in the customers’ patronage and income realized from the sales of bush meat after the outbreak. Also, challenges to bush meat and its consumption affect effective bush meat business in the study area. It is hereby recommended that more awareness should be created by government through mass media that Nigeria is free of EVD and bush meat is safe for public consumption while the electricity problem should be urgently resolved to facilitate bush meat processing and storage. Agricultural

Extension agents and Community Health Workers should focus on training and capacity building for quality and healthy bush meat business in the study area.

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