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Original Research Article

DOG ANTI-RABIES VACCINATION COVERAGE IN EBONYI STATE, NIGERIA

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ABSTRACT

Rabies is amongst the most fatal diseases of public health importance in the tropics. Rabies outbreaks can be prevented in a population if most of the dogs are immune and this immunity can be achieved by vaccinating the dog population annually especially in endemic areas. The objective of this study was to investigate the response of dog owners to anti-rabies vaccination and to check how selected variables were associated with the turnout of dogs during the two consecutive years of mass vaccination. One thousand three hundred dogs were vaccinated in 2022 while one thousand seven hundred and eighty-seven dogs got vaccinated in 2023. The percentage of female dogs presented for vaccination in 2022 and 2023 was 66.8 % and 66.5% higher than the males. The mongrels were 94.1% and 98.2% more than the other breeds presented for vaccination in both 2022 and 2023. The association between the breed of dogs and the year of vaccination was statistically significant (p=0.000). It was concluded that more effective awareness and sensitization programs on the effects of rabies are needed to help educate the rural communities.

Keywords: Anti-rabies, Dogs, Rabies, Vaccination

INTRODUCTION

Rabies is a very important zoonotic and highly fatal neurological disease of all warm-blooded mammals primarily caused by the classical rabies virus of the genus Lyssavirus and family Rhabdoviridae, mostly transmitted by the bite of a rabies-infected animal (Rupprecht *et al.*, 2002; Nel, 2013).

Dog rabies is endemic in Nigeria and is maintained by dog-to-dog transmission (Oduye & Aghomo, 1985). More than 99% of human rabies exposures are caused by domestic dog (*Canis familiaris)*. The dog population is increasing and poor dog ownership practices prevail (Adaba *et al.*, 2004).

The WHO recommends that about 70% of dogs needs to be vaccinated to control rabies in a community (WHO, 1989; Knobel *et al.*, 2007). Vaccination of dogs against the rabies has proven to be the most effective method of prevention and control of canine rabies (WHO, 2013 and Odita *et al.*, 2019).

To achieve this, the vaccination of 70% of the dog population as recommended by the WHO must be attained (Medley *et al.*, 1996). Canine rabies vaccination has eliminated canine rabies in the United States and Great Britain as well as controlled rabies throughout western Europe, South America, and regions of sub-Saharan Africa and Asia where it has been maintained at sufficient coverage (Velasco *et al.*, 2008 & Franca *et al.*, 2013).

According to Jibat *et al.*, 2015, this is not the case in most African countries and this is of great public health concern because in the case of an outbreak of rabies, the fatality rate is almost 100% (Rupprecht *et al.*, 2018).

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This study was aimed at mass vaccination of dogs to reduce the risk of occurrence of the outbreak of rabies, obtaining demographic features of vaccinated dogs, and other data for record keeping.

METHODOLOGY

STUDY AREA

Figure I: Map of Ebonyi state showing the local government areas in the different agricultural zones (Onyeneke *et al.*, 2022)

Sampling and data collection

A total of 12 local governments from the three agricultural zones in Ebonyi state were visited. House to house visitation was done to enable us reach as many dogs as possible. Also there were designated areas where dog owners could also take their dogs for vaccination. The information collected included the breed of dog, age, sex and coat colour. The name and phone numbers of the dog owners were also documented. Vaccines used were supplied by FMARD and cold chain was achieved using solar deep freezers in the Department of Veterinary Services and maintained by MANR, Ebonyi state.

Study population: All the residents of Ebonyi state that own dogs in both rural and urban areas. The inclusion criteria were all dogs above three months of age.

Data analysis: Data was entered, cleaned using Microsoft Excel and analyzed using IBM SPSS version 20. Chi-square was used to determine the association between the variables. Microsoft Excel was used to create tables and figures.

RESULTS

One thousand three hundred dogs were vaccinated in 2022 while one thousand seven hundred and eighty seven dogs got vaccinated in 2023 (Figure II). The distribution of the number of vaccinated dogs in each of the visited LGA is represented in Figure III. From the figure, it was noticed that Isielu LGA had the highest number of vaccinated dogs in 2022 while Ikwo LGA had the highest number of vaccinated dogs. Ezza North had the least number of vaccinated dogs in both 2022 and 2023. No dog was vaccinated in Ikwo LGA in 2022 and in 2023; no dog was vaccinated in Ohaozara LGA. Isielu LGA had the highest number of vaccinated dogs in Ebonyi state while Ohaozara LGA had the lowest number of vaccinated dogs. The association between the number of dogs vaccinated in each local government and the year of vaccination was statistically significant at p = 0.000.

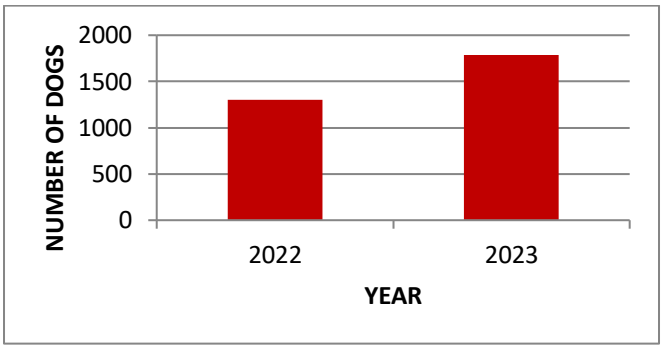

Figure II: The frequency of number of dogs vaccinated

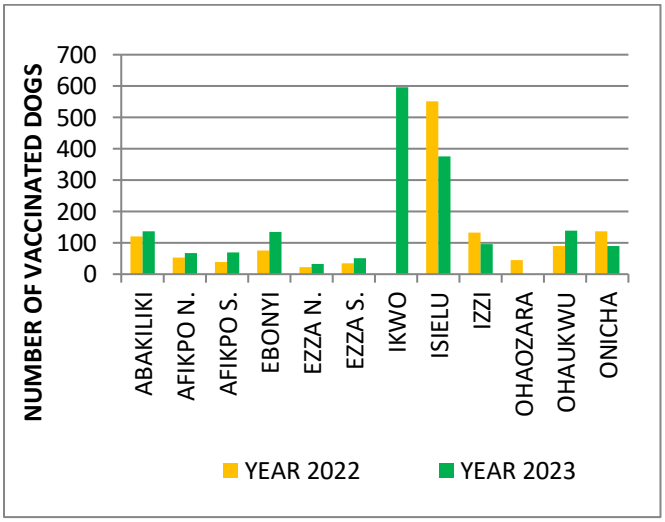

Figure III: Distribution of vaccinated dogs across the LGAs

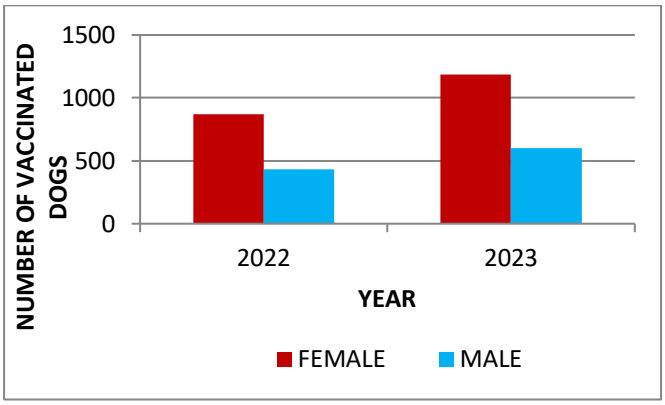

Figure IV: The distribution of vaccinated dogs by sex

The most prevalent breed of dogs vaccinated in both 2022 and 2023 was the mongrel. The mongrels were 94.1% and 98.2% more than the other breeds presented for vaccination in both 2022 and 2023. The association between the breed of dogs and the year of vaccination was statistically significant (p=0.000).

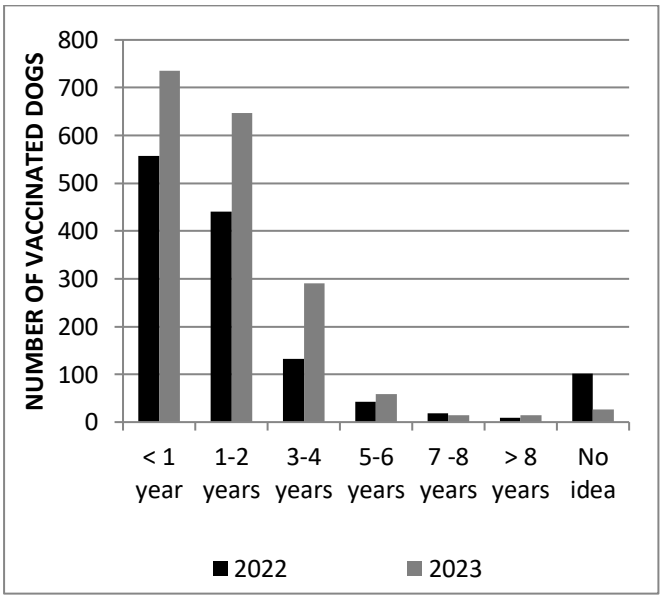

Figure V: The distribution of vaccinated dogs by age

TABLE I: THE DISTRIBUTION OF BREEDS OF VACCINATED DOGS

BREEDS	2022	2023
Alsatian	0	1
Boerboel	1	1
Bullmastiff	7	0
Canaan	1	0
Cane Corso	2	0
Caucasian	19	2
English shepherd	0	1
Eskimo	1	0
German Shepherd	19	12
Lhasa Apso	3	2
Mixed breed	11	9
Mongrel	1223	1754
Neapolitan mastiff	2	0
Rottweiler	10	5
Terrier	1	0
Total	1300	1787

Majority of the dogs vaccinated were less than a year old (< 1 year), and the least vaccinated age group were those greater than 8 years. In 2022, one hundred and two (102) clients had no idea of the age of their dogs while in 2023; only 26 clients had no idea of their dog's age. The association of the age of vaccinated dogs with the number vaccinated each year was statistically significant (p = 0.000).

In both 2022 and 2023, more female dogs were presented for vaccination than male dogs. The percentage of female dogs presented for vaccination in 2022 and 2023 was 66.8 % and 66.5% higher than the males. The association between the sex of vaccinated dogs and the year of vaccination was not statistically significant. (p = 0.831).

Majority of the dogs vaccinated were less than a year old (< 1 year), and the least vaccinated age group were those greater than 8 years. In 2022, one hundred and two (102) clients had no idea of the age of their dogs while in 2023; only 26 clients had no idea of their dog's age. The association of the age of vaccinated dogs with the number vaccinated each year was statistically significant (p = 0.000).

DISCUSSION

The mass vaccination of dogs against rabies embarked on in Ebonyi state for two years is aimed at attaining the 70% vaccination of dogs recommended by WHO to achieve eradication of canine rabies and with extension human rabies. This mass vaccination of dogs in Ebonyi state is very important because while the dog population in Nigeria is on the increase, only an insignificant number of dogs are vaccinated annually (Ahmed *et al.*, 2000 & Adaba *et al.*, 2004). There was an increase of 15.7% in the number of dogs presented for vaccination in 2023 than the previous year. This is a good increase but could be improved with better sensitization and awareness programs.

The distribution of the number of vaccinated dogs in each of the visited LGAs represented in Figure III shows that some LGAs had more dogs presented for vaccination than others.

This difference was attributed to the occupation and location of the members of the different communities.

The communities that presented more dogs for vaccination were either urban or semi-urban. The rural communities that presented fewer dogs for vaccination were mostly communities with hunters. In some rural communities, most hunters refused to bring their dogs for vaccination stating that vaccinating their dogs makes the teeth of the dog weak. This is of great concern because routine dog vaccination will only be successful if dog owners are willing to regularly seek veterinary services and also rabies primarily affects impoverished and rural communities thereby many cases go unnoted (Knobel *et al.*, 2005, Dodet *et al.*, 2010 & Broban *et al.*, 2018).

In Ikwo LGA were no dog was vaccinated in 2022 and this was because the workers (both veterinarians and Para-veterinarians) were been owed 8 months of hazard allowance and therefore refused to cooperate with the team. Most of the communities with zero turnouts had a culture of not keeping dogs in their households.

The fact that mongrels were the most prevalent breeds presented for vaccination in both 2022 and 2023 is attributed to the fact that they are indigenous breeds and cheaper to acquire. This was consistent with finding by (Otolorin *et al.*, 2014 & Nwoha and Nwaogu, 2021).The higher prevalence of female dogs presented for vaccination might be indicative of their use for the purpose of breeding. This result was also seen in a study by Columba *et al.*, 2024.

Majority of the dogs vaccinated were less than a year old (< 1 year) and this may be due to the fact that group of dogs were receiving the vaccine for the first time.

CHALLENGES FACED

The major challenge faced was that of inadequate funds to transport more people to the communities. The staff members in some communities were nonchalant due to owed allowances and these greatly affected the manpower making it difficult to reach some communities and also affected the timing of this project.

CONCLUSION AND RECOMMENDATIONS

The actual population of dogs in Ebonyi state was not known before this mass vaccination campaign. Therefore it was impossible to determine the percentage turn out of dogs for vaccination. To determine the actual population of dogs, dog owners should be advised to register their dogs and get a license for them according to the Dog Ordinance (Rabies Control law) of 1942 (repealed). Also, records of vaccinated dogs should be properly documented at every point. Funds should be made available for sero-surveillance after vaccination to evaluate the immune response of dogs against rabies. We wish to acknowledge the contributions of REDISSE (Regional Disease Surveillance Systems Enhancement) to the success of this research.

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