

PASSIVE SURVEILLANCE ON DOG BITES AND RABIES IN HOSPITALS IN UMUAHIA NORTH AND SOUTH LGA OF ABIA STATE NIGERIA

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ABSTRACT

It has been estimated that about 10, 000 humans are exposed to rabies each year in Nigeria from bites of rabid dogs, hence the need to investigate on the prevalence of dog bite cases and clinical rabies in Umuahia North and South of Abia state. An 11-yr retrospective survey of dog bite cases and clinical rabies cases was carried out in Umuahia north and south LGA of Abia state, Nigeria using data collection on dog bite cases from private and government owned hospitals in Umuahia north and south LGA of Abia state. The data on hospital dog bite cases was collected from 2014 till date. It was a month study. Results were represented as total number affected per 100,000 of population. Result recorded a low prevalence rate of 268.8/ 100,000 population in Umuahia South, 227.1/100,000 population in Umuahia North and total prevalence rate 243.1/100,000 population in Umuahia North and South LGA of Abia State. There was zero prevalence case of rabies from 2014 till date within private and government owned hospitals in Umuahia north and south LGA of Abia state. The bar-chart show fluctuations and no definite pattern in the rate of dog bite victims across the years. Males show more at risk of dog bite with tall bar charts than females. We recommend further enhancement on public sensitization on dangers of dog bite and promote canine vaccination program for sustainability in the decreased status to align with the global target of eradication of rabies in Africa by 2030.

Keywords: Dog, Dog bite victim, Rabies, Umuahia North, Umuahia South

INTRODUCTION

Rabies is an acute viral infection of the central nervous system, characterized by irritation of central nervous system, paralysis and death (CDC, 2024). In Africa, transmission of rabies virus is principally through the bite of infected animal especially dog (WHO, 2023). Dog bite victims are often traumatized physiologically and emotionally (Peter *et al.*, 2004; Schalamon *et al.*, 2005; Keuster *et al.*, 2006). Dog bite in humans is of public health importance worldwide especially in the developing countries and it exposes victims to many potential zoonoses (Chiraz, 2003). The most feared consequence of dog bite is rabies, especially in Africa (Dye *et al.*, 2007; Bata *et al.*, 2011). In most African countries especially in the western and central Africa, there is absence of policy on notification of rabies cases in humans and animals (Dobet *et al.*, 2008). And this has resulted in absence

of emergency preparedness programs and stringent anti-rabies vaccination campaigns control measures. These situations are tackled by mounting frequent surveillance programs, hence the need for retrospective study on dog bite cases and clinical rabies in Umuahia North and South local government areas of Abia state.

MATERIALS AND METHODS

STUDY AREA

The study was conducted in Umuahia North and South LGA which are among the 17 local governments of Abia state. Umuahia North has its headquarters located within the city of Umuahia. It boasts of about 38 (thirty-eight) villages and 324,900 population according to the projection of Umuahia North, 2022) and about 256.8km area.

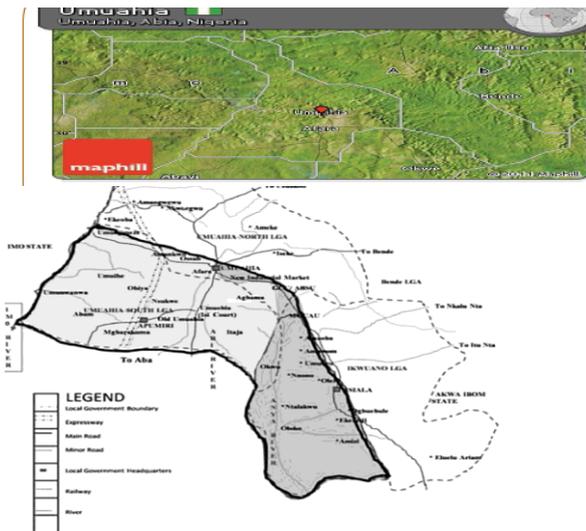


Figure 1: Map Showing Sampled Areas of Umuahia North and Umuahia South

Umuahia South has its headquarters located at Apumiri in Ubakala. It is located in the South-eastern part of Abia state and comprised of more than forty villages and town. It has about 202,500 population, 141.6 km area and population density of 1,430/km.

At present, Umuahia North boasts of 2 government owned hospitals with over 10 private owned hospitals while in Umuahia South, there are over 10 private owned hospitals and 1 government owned hospital.

STUDY DESIGN

Out of the Villages in Umuahia North, ten (10) were purposively sampled because of the availability of government owned and private Hospitals. In Umuahia South Nine (9) villages were purposively sampled due to the availability of government owned and private hospitals. In each of the communities, all government owned and private hospitals were visited and records of existing dog bite and rabies cases from 2014-2024 were collated.

PROCEDURE

Data on dog bites were obtained from the public health sections of the hospital after obtaining official permission from the hospitals administrative department with the help of approval letter from the Head of Department of Veterinary Medicine, Michael Okpara University of Agriculture Umudike.

Records of dog bites and rabies cases from 2014 to date were obtained from the records office of the public health section of the hospitals.

STATISTICAL ANALYSIS

The prevalence rate was calculated using the formula

$$\frac{\text{No. of positive cases}}{\text{Sampled population}}$$

The results were expressed per 100,000 population (James, 2024). The sex distribution of dog bite cases and year were represented on bar charts.

RESULTS

PREVALENCE OF DOG BITE AND RABIES CASES IN UMUAHIA NORTH AND UMUAHIA SOUTH LGA, ABIA STATE, NIGERIA

UMUAHIA NORTH

In Umuahia North LGA, a total number of 559 dog bite cases were recorded in the Government owned hospitals, while a total of 179 cases were recorded in private hospitals, making a total of 738 cases recorded in hospitals in Umuahia North LGA of Abia State.

Prevalence of dog bite cases in Umuahia North LGA was recorded at 0.0022714681440. Because the ratio is small, the rate was expressed as the number of cases per 100,000 population which equaled 227.1 per 100,000 population

UMUAHIA SOUTH

In Umuahia South LGA, a total number of 357 dog bite cases were recorded in government hospitals while a total of 187 cases were recorded in private hospitals, making a total of 544 cases recorded in hospitals in Umuahia South LGA of Abia State.

Prevalence of dog bite cases in Umuahia South LGA was recorded at 0.0026864197530, because the ratio is small, the rate is expressed as the number of cases per 100,000 population, which equaled 268.8/100,000 population.

TOTAL PREVALENCE OF DOG BITE AND RABIES CASES IN UMUAHIA NORTH AND UMUAHIA SOUTH LGAS OF ABIA STATE, NIGERIA

Total Prevalence of dog bite cases in both Umuahia North and Umuahia South LGA was 0.0024307925673, which equaled 243.1/100,000 population.

PREVALENCE OF RABIES CASES IN UMUAHIA NORTH AND UMUAHIA SOUTH LGA OF ABIA STATE, NIGERIA

There was zero prevalence case of rabies recorded from 2014 till 2024 within both government owned and private hospitals in Umuahia North and Umuahia South LGA of Abia, Nigeria.

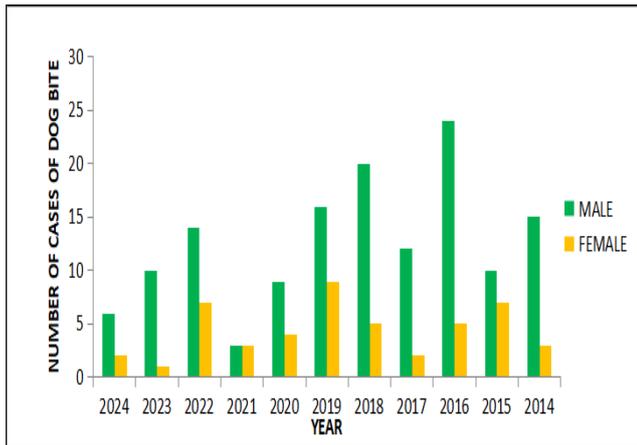


Figure II: Number of dog bite cases in private hospitals in Umuahia South

From Figure II above, there were significant fluctuation in the prevalence rate of dog bite cases in private hospitals in Umuahia South recorded in various years in males and females from 2014 to 2024. The least was recorded in 2021 and higher rates recorded in 2014, 2016, 2018, 2019 and 2022. The highest prevalence was recorded in 2016 in males compared to females. Generally, the prevalence rate of dog bite was higher in males than in females across the years.

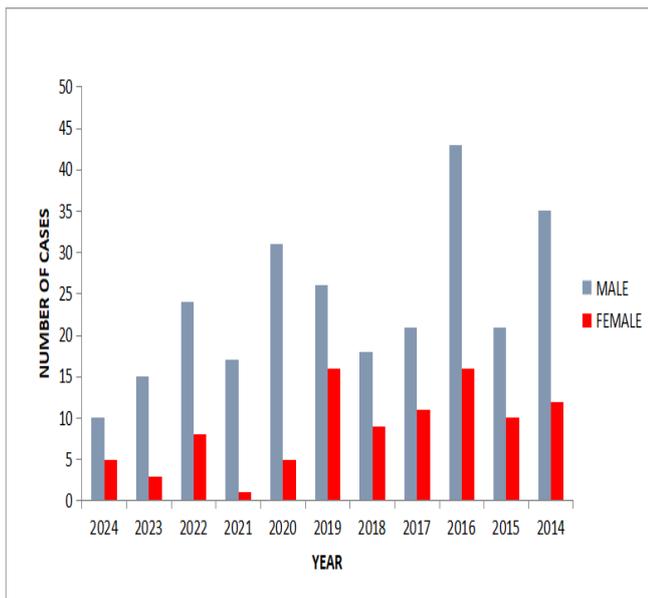


Figure III: Number of dog bite cases in government owned hospitals in Umuahia South

From the Figure III above, there were significant fluctuation in the prevalence rate of dog bite cases in government hospitals in Umuahia South recorded in various years in males and females from 2014 to 2024. The least was recorded in 2024 and higher rates recorded in 2014, 2015, 2016, 2017, 2019, 2020, and 2022.

The highest prevalence was recorded in 2016 in males compared to females. Generally, the prevalence rate of dog bite was higher in males than in females across the years.

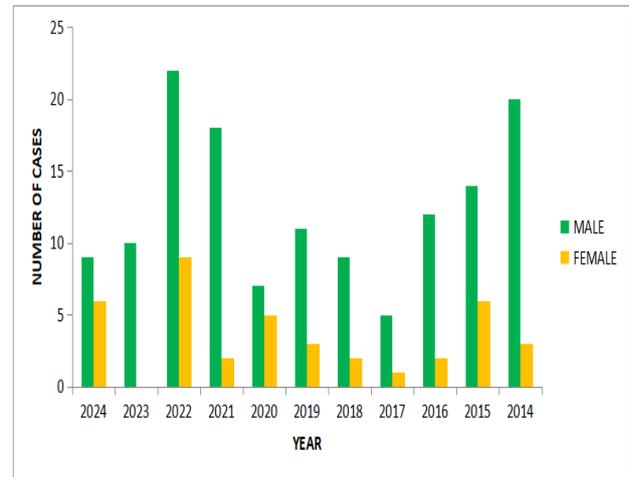


Figure IV: Number of dog bite cases in private hospitals in Umuahia North

From the Figure IV above, there were significant fluctuation in the prevalence rate of dog bite cases in private hospitals in Umuahia North recorded in various years in males and females from 2014 to 2024. The least was recorded in 2017 and higher rates recorded in 2014, 2015, 2016, 2018, 2019, 2021, 2022, 2023 and 2024. The highest prevalence was recorded in 2022 in males compared to females. Generally, the prevalence rate of dog bite was higher in males than in females across the years.

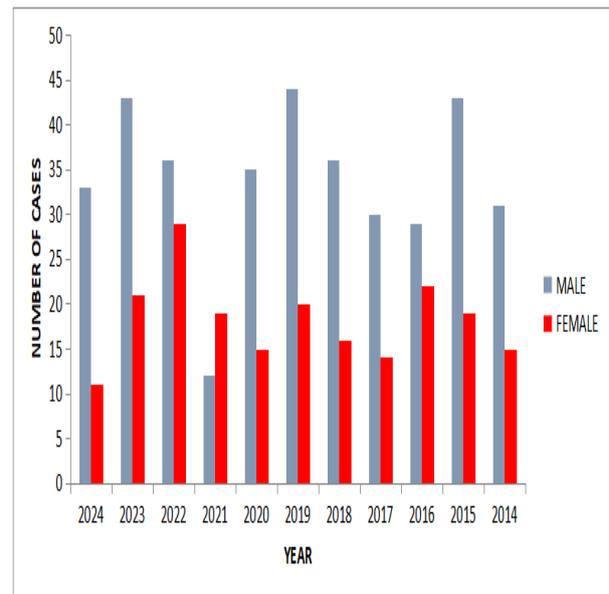


Figure V: Number of dog bite cases in government owned hospitals in Umuahia North

From the Figure V above, there were significant fluctuation in the prevalence rate of dog bite cases in government

hospitals in Umuahia North recorded in various years in males and females from 2014 to 2024. The least was recorded in 2021 and high rates recorded in 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2022, 2023, and 2024. The highest prevalence was recorded in 2015, 2019 and 2023 in males compared to females. Generally, the prevalence rate of dog bite was higher in males than in females across the years.

DISCUSSION

The retrospective study, recorded a prevalence rate of dog bites cases of 243.1 per 100,000 population observed in hospital cases. This marked a relative decrease in prevalence rate compared to what was previously recorded 0.44% (440 per 100,000 population) from the hospital obtained within the study area (Nwoha & Ugwuoke, 2017). The rate was however higher when compared to a similar study of same duration conducted in Federal medical Centre Jalingo, Taraba state which recorded 81 per 10,000 population (Obialigwe *et al.*, 2024). The marked decrease in the prevalence rate could be attributed to increasing awareness on the dangers associated with dog bite and also consistent vaccination campaigns within the study area.

Despite the recorded prevalence in dog bite cases, there was zero prevalence case of rabies recorded from 2014 till date within both private and government owned hospitals in Umuahia north and Umuahia south Local Government Areas of Abia state. This also corroborates the earlier work done by Nwoha & Ugwuoke (2017) within the same study area. This finding supports the assertion that though rabies occurs in most countries in the African continent, but the reported incidence is surprisingly low for an area with such a high population of wild carnivores (Beards, 2021). This finding may seem to indicate that the dog bite cases may simply be due to provoked bites rather than unprovoked bites. This corroborates earlier work done that states that most dog bite cases are provoked (Rosado *et al.*, 2008; Bard, 2015). It however differs with the work of Mshelbwala *et al.* (2021), who recorded high rate in unprovoked bites (36.4-97%) in victims. Other factors liable for zero-prevalence in clinical rabies in the study area maybe due to non- presentation of clinical cases to the hospitals for adequate record keeping, as most times clinical rabies manifest months to years after initial dog bite (WHO, 2024). This corroborates the statement that most cases of rabies in humans and dogs are underreported (Amed *et al.*, 2023).

There seems no particular pattern in the rate of dog bite cases among sex recorded across the year. Fluctuations observed on the bar charts may connote apparent inconsistency in awareness programs on the risk associated with dog bite. The numbers of dog bite victims were recorded more in government owned hospitals and amongst males within Umuahia North than in Umuahia South due to high

population density within Umuahia North. Moreso, most residents patronize government hospital than private owned due to cost implication which is relatively high in private hospitals than in governed owned.

Generally observed is a higher case of dog bite victims amongst males than females as they may have different interactions with dogs or be exposed to different environments that increase or decrease their risk of being bitten (WHO, 2018). This corroborates the findings of Apeh *et al.* (2021). The high prevalence rate of dog bite cases in male compared to females could also be attributed to their boisterous and rough attitude that makes them act in ways that dogs perceive as threatening or aggression (Rosenberg *et al.*, 1995).

CONCLUSION

Dog bites and clinical rabies remain significant public health concerns in Umuahia North and South LGA of Abia state, Nigeria. The study recorded a decreased level of prevalence rate of dog bite cases in Umuahia north and south of Abia state which was attributed to provoked bites on the victims. The prevalence rate of dog bite victims was higher in males than in female. There were fluctuations and no definite pattern on the dog bite victims recorded across the years. Cases were more in government hospitals than in private owned. The zero prevalence in clinical rabies may indicate an increase in public awareness to canine vaccination program against rabies in the area.

Further enhancement of public sensitization on canine vaccination program for sustainability in the decreased status which promotes global target of eradication of rabies in Africa by 2030 is recommended. Efforts should be geared towards public education particularly among high-risk groups on dog behaviour, bite prevention, and post-bite care. These efforts would ensure effective interventions, sustainability in decreasing dog bite and rabies cases and promotes the health and well-being of the community.

REFERENCES

- Ahmed, S.I., Islam, M.S., Khan, M.S. & Islam, M.A. (2023). Epidemiology and molecular characterization of rabies virus in Bangladesh. *Journal of Plos Neglected Tropical Diseases*, 17(4).
- Apeh, O., Umoh, J. & Ajogi, I. (2021). Rabies: A review of the disease in Nigeria. *Journal of Veterinary Medicine and Animal Health*, 13(1):1-11.
- Bard, J. (2015). Rabies. *Medicine*, 49(1): 51-55.
- Bata, A.I. Mohammed, B. & Yakubu, B. S. (2011). Rabies. A Review of the disease in Nigeria. *Nigerian Veterinary Journal*, 20(2), 131-136.

- Beard, J. (2021). Rabies: A neglected tropical disease. *Tropical Medicine and Infectious Diseases*, 6(3), 143.
- Center for Disease Control and Prevention (CDC) (2024). Use of a reduced (4-dose) vaccine schedule for post-exposure prophylaxis to prevent Human rabies recommendation of the Advisory committee on immunization practices.
- Chiraz (2003). Comparative study on the immunogenicity of two commercial rabies vaccines in healthy adults. *Vaccine*, 31(5), 751-756.
- Dobet, A., Nadin-Davis, S. A. & Gould, E.A. (2008). Molecular epidemiology of rabies in Africa. *Virus Research*, 134(1-2), 1-11.
- Dye, C., Gleason, N., Tordo, N., Mamino, O.F., Kuzmin, A.S. & Fooks, A. R. (2007). The origin and emergency of a rabies. *Epidemic*, 104(12), 4872-4877.
- Keuster, D., Briggs, D.J. & Blanton, J. D. (2006). Rabies in CE (Ed), *Infectious diseases of the dog and cat*. 3rd Ed, Elsevier, PP 167-183.
- James V. M. (2024). Basic statistics: about incidence, prevalence, morbidity and mortality-statistics teaching tools. New York department of health, Corning tower, Empire state plaza, Albany, NY 12237.
- Mshelbwala, P.P., Weese, J. S., Sanni Adeniyi, O. A., Chakma, S., Okeme, S.S. & Mamun, A.A. (2021). Rabies epidemiology, prevention and control in Nigeria scoping progress towards elimination.
- Nwoha R.I.O. & Ugwuoke, C.C. (2017). Rabies in Nigeria: A review, *Nigeria Veterinary Journal*, 39(2), 49-59.
- Obialigwe, T. F., Liatu G., Ambi, S.N., Iranyang, B.U, Garleya, B., Kingsley, C.E. & Elizabeth, T. (2024). *Science World Journal*, 19(3), 697-700.
- Peter, J.F. & Jackson, A.C. (2024). Rabies. *New England Journal of Medicine*, 350(5), 513-519.
- Rosado, B., Gracia-Belenguer, S., Leon, M. & Palaco, J. (2008). A comprehensive study of dog bites in Spain, 1995-2004. *Veterinary Journal*, 179, 383-391.
- Rosenberg, N.L., Abramo, A. & Schunk, J. (1995). Dog bites. *Pediatrics Emergency Care*, 11, 313-316.
- Schalamon, J., Sure, H. & Hocker, P. (2005). Transmission of rabies through organ transplantation. *American Journal of Transplantation*, 6(10), 2513.
- World Health Organization (2018). Rabies. WHO Fact sheet.No.99.
- World Health Organization (2023). Zero by 30. The global strategic plan to end human deaths from dog-mediated rabies by 2030.
- World Health Organization (2024). Rabies. [Who.int/newsroc](https://www.who.int/newsroc).