
**A RESTROSPECTIVE STUDY ON THE RISK FACTORS AND MANAGEMENT
OF HUMAN DOG BITES IN GREATER ARUA, WEST NILE SUB REGION**

BY

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**A DISSERTATION SUBMITTED TO THE FACULTY OF AGRICULTURE AND
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OCTOBER, 2024

DECLARATION

I ASEA Fred declare that this dissertation report is my personal work and has never been submitted for the award of a degree in any other university or institution.

Signature


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Date

6/11/2024
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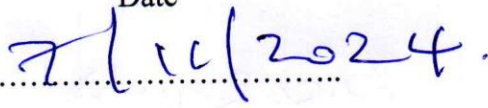
APPROVAL

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DEDICATION

With great honor, I would like to dedicate this dissertation report to my father Mr. Asea jimmy Odrade, my Classmates, family members, and AHO- ARUA District Local Government for his guide and support rendered.

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The great acknowledgement goes to almighty God for the abundant protection amidst all the challenges faced during the journey and good health given to me making me to complete the dissertation successfully and also to the following personalities for guide and support. My supervisor Dr. ziritunda Gerald, Dr. Willy Nguma DVO Arua, Lecturer Mr. Daniel Egaru. Credit also goes to all lectures who have lectured tirelessly, the H.O.D Animal Science and the management of Busitema University Arapai campus. May you all use this dissertation for future reference to improve on the agricultural and veterinary sector in value chain actors of this country Uganda?

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LIST OF ABBREVIATION

AHO.....Animal husbandry officer

C.I.Confidence interval

Dr.....Doctor

NLatitude

DHO.....District health officer

DVO.....District veterinary officer

E.....Longitude

H.O.D.....Heads of department

MR..... Mister

UNMA.....Uganda National Meteorological Authority

WHOWorld Health Organization

O.R.....Odds Ratio

ABSTRACT

In Greater Arua, West Nile Region, dog bites pose a growing public health concern, particularly impacting young adults and urban communities. This study aimed to assess the prevalence, associated risk factors, and management practices of dog bites across different demographics and locations within Greater Arua. The study used a cross-sectional survey design, gathering quantitative and qualitative data from dog bite victims, healthcare providers, and local authorities to understand the scale and distribution of incidents. Statistical analyses, including odds ratios, p-values, and confidence intervals, were applied to explore relationships between dog bite incidents and demographic variables such as age, gender, and district location.

Key findings indicated that individuals aged 18-35 faced the highest prevalence of dog bites (29.13%) with a borderline statistical significance ($p = 0.05$). Arua City recorded the highest concentration of bites (71.17%), with a strong statistical link between district location and dog bite prevalence ($p = 0.003$), while gender showed no significant difference in bite incidence. Notably, unprovoked bites represented 55.26% of all cases, underscoring a serious risk of rabies transmission. The study concluded that dog bites are a substantial health issue in Greater Arua, with targeted public health interventions required in high-prevalence areas. Based on these findings, recommendations include implementing educational campaigns focused on the 18-35 age group, stricter dog control measures, and enhanced rabies control initiatives. Addressing gaps in dog bite management, such as the need for accessible reporting systems, improved healthcare access, and training in wound management, is essential for improving public safety and encouraging responsible dog ownership across the region.

CHAPTER ONE: INTRODUCTION

1.1 Background

The escalating global concern surrounding dog bites poses a significant challenge to public health, affecting both human and animal populations (Fonseca *et al.*, 2015). Notably, research conducted between 2010 and 2021 consistently underscores the heightened prevalence of dog bites in rural areas compared to urban locates (Román *et al.*, 2023). Throughout this period, study has reported annual prevalence of human dog bites rates ranging from 11 to 250 cases per 1,000 populations in specific rural regions (Sharma *et al.*, 2016), emphasizing the urgent need for focused investigation.

This study has identified various factors contributing to the increased risk of dog bites in rural communities. Limited access to veterinary services, inadequate dog owner education, a higher presence of free-roaming dogs, and insufficient awareness of preventive measures emerge as key factors in these settings (Daigle *et al.*, 2022)

Recent research has also shed light on the divergence in management practices and healthcare-seeking behavior for dog bites between rural and urban areas. Investigations in rural regions, including Uganda and Kenya, reveal that individuals in these communities may have restricted access to medical facilities, often resorting to traditional remedies for dog bite (Penjor *et al.*, 2019). This underscores the need to explore these practices within the unique context of the greater Arua West Nile sub-region.

Additionally, study conducted between 2010 and 2021 have highlighted the economic burden of dog bites, particularly in rural communities with limited access to healthcare and financial resources. The average cost of treating a dog bite during this period ranged from Ugs= 56,124 to Ugs= 127,215 per person in rural areas, underscoring the financial challenges faced by affected individuals and communities (Daigle, Ravel, Rondenay, *et al.*, 2023).

Building on insights gained from study conducted between 2010 and 2021, this research proposal seeks to comprehensively investigate the prevalence and risk factors of dog bites in both animals and the human population in rural communities within greater Arua. By leveraging the accumulated knowledge over this period, the proposed study aims to contribute to a broader understanding of dog bite epidemiology in rural settings. The findings will guide to develop interventions that effectively will address this public health issue and enhance the well-being of both humans and animals in greater Arua District and similar rural communities.

References

- Adabanya, U., Awosika, A., Moon, J. H., Reddy, Y. U., & Ugwuja, F. (2023). Changing a Community: A Holistic View of the Fundamental Human Needs and Their Public Health Impacts. *Cureus, 15*(8). <https://doi.org/10.7759/CUREUS.44023>
- Ali, M. I., Jamali, S., Ashraf, T., & Ahmed, N. (2021). Patterns and Outcomes of dog bite injuries presenting to emergency department in a tertiary care hospital at Karachi. *Pakistan Journal of Medical Sciences, 37*(3), 794. <https://doi.org/10.12669/PJMS.37.3.3464>
- Awuni, B., Tarkang, E., Manu, E., Amu, H., Ayanore, M. A., Aku, F. Y., Zieme, S. A., Bosoka, S. A., Adjuik, M., & Kweku, M. (2019). Dog owners' knowledge about rabies and other factors that influence canine anti-rabies vaccination in the Upper East region of Ghana. *Tropical Medicine and Infectious Disease, 4*(3), 115.
- Barrios, C. L., Bustos-López, C., Pavletic, C., Parra, A., Vidal, M., Bowen, J., & Fatjó, J. (2021). Epidemiology of Dog Bite Incidents in Chile: Factors Related to the Patterns of Human-Dog Relationship. *Animals 2021, Vol. 11, Page 96, 11*(1), 96. <https://doi.org/10.3390/ANI11010096>
- Brookes, V. J., Dürr, S., & Ward, M. P. (2019). Rabies-induced behavioural changes are key to rabies persistence in dog populations: Investigation using a network-based model. *PLoS Neglected Tropical Diseases, 13*(9), 1–19. <https://doi.org/10.1371/journal.pntd.0007739>
- Ćetković, J., Žarković, M., Knežević, M., Cvetkovska, M., Vujadinović, R., Rutešić, S., Beljkaš, Ž., Grujić, M., & Adžić, B. (2022). Financial and Socio-Economic Effects of Investment in the Context of Dog Population Management. *Animals 2022, Vol. 12, Page 3176, 12*(22), 3176. <https://doi.org/10.3390/ANI12223176>
- Constantino, C., Da Silva, E. C., Dos Santos, D. M., Paploski, I. A. D., Lopes, M. O., Morikawa, V. M., & Biondo, A. W. (2023). One Health Approach on Dog Bites: Demographic and Associated Socioeconomic Factors in Southern Brazil. *Tropical Medicine and Infectious Disease, 8*(4). <https://doi.org/10.3390/TROPICALMED8040189/S1>
- Daigle, L., Delesalle, L., Ravel, A., Ford, B., & Aenishaenslin, C. (2022). Occurrence and Risk Factors of Dog Bites in Northern Indigenous Communities: A Scoping Review. *Frontiers in Veterinary Science, 9*. <https://doi.org/10.3389/FVETS.2022.777640>
- Daigle, L., Ravel, A., Lévesque, F., Mokoush, K. N., Rondenay, Y., Simon, A., & Aenishaenslin, C. (2023). Barriers and opportunities for improving dog bite prevention and dog management

- practices in northern Indigenous communities. *Frontiers in Veterinary Science*, *10*.
<https://doi.org/10.3389/FVETS.2023.1199576/FULL>
- Daigle, L., Ravel, A., Rondenay, Y., Simon, A., Mokoush, K. N., & Aenishaenslin, C. (2023). Knowledge, attitudes, and practices regarding dogs and dog bites in Indigenous northern communities: A mixed methods study. *Frontiers in Veterinary Science*, *10*, 1080152.
<https://doi.org/10.3389/FVETS.2023.1080152/BIBTEX>
- Donelle, L., Comer, L., Hiebert, B., Hall, J., Shelley, J. J., Smith, M. J., Kothari, A., Burkell, J., Stranges, S., Cooke, T., Shelley, J. M., Gilliland, J., Ngole, M., & Facca, D. (2023). Use of digital technologies for public health surveillance during the COVID-19 pandemic: A scoping review. *Digital Health*, *9*. <https://doi.org/10.1177/20552076231173220>
- Duamor, C. T., Hampson, K., Lankester, F., Lugelo, A., Chagalucha, J., Lushasi, K. S., Czupryna, A., Mpolya, E., Kreppel, K., Cleaveland, S., & Wyke, S. (2023). Integrating a community-based continuous mass dog vaccination delivery strategy into the veterinary system of Tanzania: A process evaluation using normalization process theory. *One Health*, *17*, 100575.
<https://doi.org/10.1016/J.ONEHLT.2023.100575>
- Duncan-Sutherland, N., Lissaman, A. C., Shepherd, M., & Kool, B. (2022a). Systematic review of dog bite prevention strategies. *Injury Prevention*, *28*(3), 288–297.
<https://doi.org/10.1136/INJURYPREV-2021-044477>
- Duncan-Sutherland, N., Lissaman, A. C., Shepherd, M., & Kool, B. (2022b). Systematic review of dog bite prevention strategies. *Injury Prevention : Journal of the International Society for Child and Adolescent Injury Prevention*, *28*(3), 288–297. <https://doi.org/10.1136/INJURYPREV-2021-044477>
- Fonseca, G., Mora, E., Lucena, J., & Cantín, M. (2015). Forensic studies of dog attacks on humans: a focus on bite mark analysis. *Research and Reports in Forensic Medical Science*, *39*.
<https://doi.org/10.2147/rrfms.s92068>
- Forrest, R., Pearson, M., & Awawdeh, L. (2023). Pet Owners' Attitudes and Opinions towards Cat and Dog Care Practices in Aotearoa New Zealand. *Veterinary Sciences*, *10*(10).
<https://doi.org/10.3390/VETSCI10100606/S1>
- Ghasemzadeh, I., & Namazi, S. H. (2015). Review of bacterial and viral zoonotic infections transmitted by dogs. *Journal of Medicine and Life*, *8*(Spec Iss 4), 1.
- Jakeman, M., Oxley, J. A., Owczarczak-Garstecka, S. C., & Westgarth, C. (2020). Pet dog bites in children: management and prevention. *BMJ Paediatrics Open*, *4*(1), 726.

- Johnson Gerardo Chowell, G., Gabrielle, J., Chowell-Puente, G., Barbosa Costa, G., Julie, C., Monroe, B., & Wallace, R. (2018). *Estimation of Dog-bite Rates and Evaluation of Healthcare Seeking Behaviors following Dog Bite, Haiti* Title: *Estimation of Dog-bite rates and evaluation of Healthcare Seeking Behaviors following dog bite* Authors: *Acknowledgements: Poxvirus and Rabies Branch, Division of High-Consequence Pathogens and*.
<https://doi.org/10.57709/12067553>
- Khan, U. R., Soomar, S. M., Ghazi, S. M., Naeem, R., Kerai, S., & Jamali, S. (2023). Epidemiological pattern and management of dog bite injuries in Karachi, Pakistan: A cross-sectional study. *Injury*, *54*, 110473. <https://doi.org/10.1016/J.INJURY.2022.11.016>
- Kogan, L. R., Schoenfeld-Tacher, R. M., Hellyer, P. W., Oxley, J. A., & Rishniw, M. (2019). Small Animal Veterinarians' Perceptions, Experiences, and Views of Common Dog Breeds, Dog Aggression, and Breed-Specific Laws in the United States. *International Journal of Environmental Research and Public Health*, *16*(21). <https://doi.org/10.3390/IJERPH16214081>
- Lakestani, N., & Donaldson, M. L. (2015). Dog bite prevention: Effect of a short educational intervention for preschool children. *PLoS ONE*, *10*(8), 1–14.
<https://doi.org/10.1371/journal.pone.0134319>
- Moos, B., Williams, D., Bolon, I., Mupfasoni, D., Abela-Ridder, B., & Ruiz de Castaneda, R. (2021). A scoping review of current practices on community engagement in rural East Africa: Recommendations for snakebite envenoming. *Toxicon: X*, *11*, 100073.
<https://doi.org/10.1016/J.TOXCX.2021.100073>
- Oloya, G., & Andama, M. (2019). Compliance To Riverbank Regulation Guidelines and Its Impact on the Quality of River Enyau in Arua Municipality, Uganda. *International Journal of Agriculture Environment and BioResearch*, *04*(05), 282–294.
<https://doi.org/10.35410/ijaeb.2019.4446>
- Penjor, K., Tenzin, T., & Jamtsho, R. K. (2019). Determinants of health seeking behavior of animal bite victims in rabies endemic South Bhutan: A community-based contact-tracing survey. *BMC Public Health*, *19*(1), 1–11. <https://doi.org/10.1186/S12889-019-6559-X/FIGURES/6>