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Barriers to Pet Vaccination Against Rabies in Sawla-Tuna-Kalba District, 2024

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Abstract

The issue of low rabies vaccination coverage for pets (specifically dogs and cats) in the Sawla-Tuna-Kalba District presents a significant public health challenge. Rabies is a deadly viral disease that primarily affects animals and can be transmitted to humans through bites, scratches, or exposure to infected saliva. In areas with inadequate vaccination coverage, the risk of rabies transmission increases, leading to both animal and human fatalities.

Introduction: *Rabies is a fatal zoonotic disease predominantly transmitted through bites from rabid animals, with domestic dogs accounting for the majority of cases. Vaccination is considered one of the most important measures for preventing human and animal infectious diseases. Despite the availability of effective anti-rabies vaccines, the pet vaccination rates in Sawla-Tuna-Kalba District (STKD) remain suboptimal. This study determined the factors contributing to low vaccination coverage among pets using the problem analysis approach.*

Methods: *A problem analysis was conducted in October 2024 in the Sawla-Tuna-Kalba District. We interviewed Veterinary officers on the possible factors affecting pet vaccination for rabies in the district. We also reviewed data from monthly reports, field notebooks, and movement permit books. Fishbone analysis was employed to identify and categorize the contributing factors affecting vaccination efforts. The level of control was assigned over each factor as totally within control (T), partially within control (P) and not within control (N).*

Results: *Pet owners' beliefs about vaccination in the district, Visibility of veterinary office, Inadequate motorbikes to access remote communities, Inadequate fuel allowance to carry out vaccination exercises, Lack of fridge for storage of vaccines, and high cost of anti-rabies vaccines were identified as root causes. The critical cause identified was the inadequate knowledge of rabies by farmers.*

Conclusion: *This study revealed important barriers to pet vaccination against rabies in the Sawla-Tuna-Kalba District, including inadequate knowledge among farmers and logistical challenges such as limited access to remote areas and insufficient resources. Addressing the knowledge gap among farmers is essential for improving vaccination coverage and effectively reducing the risk of rabies transmission in the community.*

Keywords: Rabies Vaccination, Sawla-Tuna-Kalba District, Problem Analysis.

Key Factors Contributing to Low Rabies Vaccination Coverage in the Sawla-Tuna-Kalba District:

1. Limited Awareness:

- Many pet owners may not be fully aware of the importance of rabies vaccination for their animals. A lack of awareness can result in pets not being vaccinated, contributing to the spread of the disease.
- There may be misconceptions or cultural beliefs that prevent owners from seeking vaccinations.

2. Access to Veterinary Services:

- In rural or remote areas like Sawla-Tuna-Kalba, access to veterinary services may be limited. This can make it difficult for pet owners to get their animals vaccinated, especially if veterinary clinics are far away or there are few mobile vaccination services.
- The cost of vaccination may also be a barrier for some pet owners, especially in economically disadvantaged areas.

3. Inadequate Government or NGO Initiatives:

- The availability of government-led vaccination campaigns or support from non-governmental organizations (NGOs) might be insufficient or irregular in the district. These campaigns are often critical for increasing vaccination coverage, especially in underserved areas.
- Insufficient funding and resources for large-scale vaccination efforts can lead to low coverage rates.

4. Pet Ownership Challenges:

- In rural regions, many households may not keep pets in the traditional sense, but rather allow animals to roam freely. This can make it difficult to track and vaccinate animals consistently.
- Stray dogs and cats may also be a significant source of rabies transmission, but without proper management programs, these animals remain unvaccinated.

5. Challenges in Animal Surveillance and Reporting:

- Monitoring and tracking rabies cases in animals can be a challenge in rural areas due to limited resources for surveillance.
- There may be underreporting of rabies cases due to a lack of diagnostic facilities or awareness among pet owners and local authorities.

Impact of Low Vaccination Coverage:

1. Increased Risk of Rabies Transmission:

- Low vaccination rates lead to higher numbers of unprotected animals, which increases the risk of rabies outbreaks in both animals and humans.
- Rabies transmission to humans is almost always fatal once symptoms appear, making timely vaccination crucial for both animals and humans.

2. Public Health and Economic Burden:

- The cost of treating rabies in humans (post-exposure prophylaxis) and the economic burden of lost productivity due to disease outbreaks can be substantial.
- Outbreaks may lead to panic and loss of trust in public health systems, which can undermine vaccination efforts

Introduction

Background

Rabies is one of the oldest known infectious diseases, and affects all mammals [1]. Rabies is one of the neglected tropical zoonotic diseases caused by a virus. It belongs to the Rhabdoviridae [2]. The disease is caused by a rhabdovirus and is most usually transmitted to humans by domestic dog bites [3, 4]. Canine rabies remains a major socioeconomic and public health problem in developing countries, claiming the lives of an estimated 55,000 people each year [5].

Vaccination is considered one of the most important measures of preventing and human and animal infectious diseases [6]. The immune system of companion animal pets, like that of all mammals, forms the backbone of body function to ensure health, well-being, and longevity while protecting against the foreign invaders of disease [7]. Once the newborn's innate and maternally derived immunity from colostrum milk wanes, the infant becomes susceptible to disease exposures until his own adaptive immunity and immune memory develops and becomes functional [8]. In between these two events, termed the "window ofsusceptibility", the infant is at risk for succumbing to infectious diseases [9]. For literally hundreds of years, vaccinations have played a key role in offsetting the undeveloped adaptive immunity of the young human and animal [10]. Owner's knowledge of preventive measures and husbandry are important factors in improving pet health and welfare. For instance, fewer behavioural problems and better welfare were reported for cats of owners with greater knowledge about their needs and behavior in a study [11].

Rabies is a lethal zoonosis caused by the rabies virus, which belongs to the Lyssavirus genus in the Rhabdoviridae family [12]. It is mostly transmitted through the bite of a rabid animal, with domestic dogs accounting for the vast majority (99%) of rabies-related human deaths worldwide [13]. Despite the invention of the first rabies vaccine by Louis Pasteur in 1885, rabies remains a neglected zoonosis that poses a potential threat to more than 3.3 billion people worldwide (WHO, 2010). In Ghana, rabies is endemic in all the regions and costs more than 16 million dollars annually (Bonodong Zongnukuu Guri et al., 2011). Rabies is well established in Accra and there has been no decline in canine or human cases during the past 5 years [14]. In rural areas, rabies cases often go unreported, as awareness of the disease is low and surveillance is sub-optimal [15]. To reach the global goal of zero dog-mediated rabies deaths by 2030, different sectors have to work together and collaborate, employing a One Health approach (Tidman R. et al., 2022).Despite the feasibility of rabies elimination, most vaccination efforts in Africa have failed to achieve high levels of coverage (Lembo et al., 2002).Interventions are clearly influenced by local dog ownership practices. For example, attitudes towards dogs and the ability and willingness of owners to handle their dogs; the location of vaccination points; and the extent of information dissemination and knowledge of rabies have all been shown to influence compliance (Lapiz et al., 2002). This study would determine why some pet owners do or do not vaccinate their dogs and cats.

Objectives

Main objective

To identify factors contributing to the low vaccination rates among animal owners in the Sawla-Tuna-Kalba District (STKD).

Methods

Study Area

The research was carried out in Sawla Tuna Kalba, a thriving

District within the Savannah region. The Sawla-Tuna-Kalba District was carved out of the then Bole District in 2004 [16]. The Sawla Tuna Kalba District falls within the Guinea savannah vegetation belt [17]. Sawla-Tuna-Kalba District recorded a population of 99,863 comprising 48.3 percent males and 51.7 percent females (2010 population and housing census).

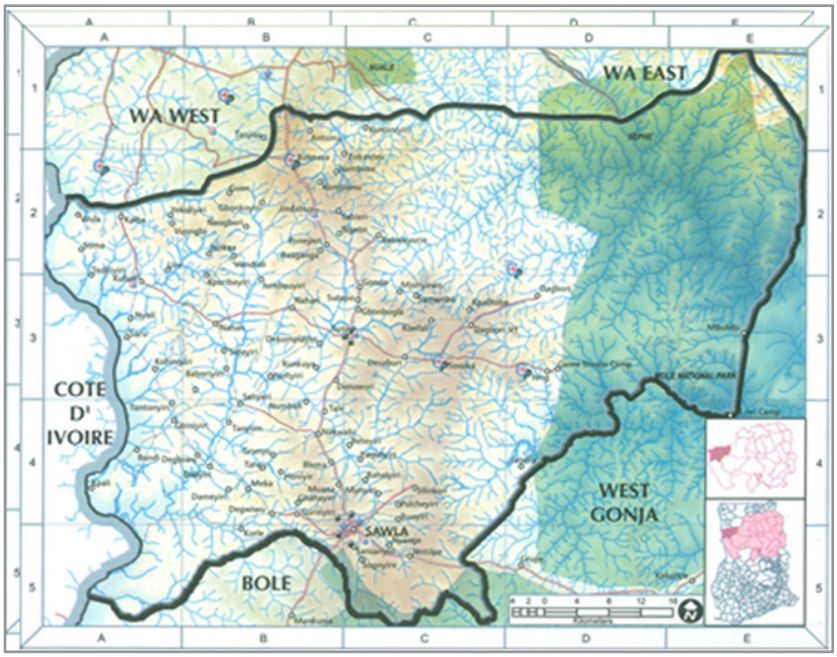

Figure 1: Map of Sawla-Tuna-Kalba District

Table 1: Number of Veterinary Officer in STKD

	Number of veteri-nary of-ficers in 2019	Number of veteri-nary of-ficers in 2020	Number of veteri-nary of-ficers in 2021	Number of veteri-nary of-ficers in 2022	Number of veteri-nary of-ficers in 2023	Number of veteri-nary of-ficers in 2024
Veterinary officers	1	4	4	10	10	10

Study Design

A descriptive cross-sectional design was used

Study Sites

The problem analysis was done in the Veterinary Services Department (VSD), STKD.

Table 2: Proportion of Vaccination of Pets Against Rabies. Sawla-Tuna-Kalba District

	2020			2021			2022			2023			2024		
	Pets pop.	Number of vaccinated	% proportion	Pets pop.	Number of vaccinated	% proportion	Pets pop.	Number of vaccinated	% proportion	Pets pop.	Number of vaccinated	% proportion	Pets pop.	Number of vaccinated	% proportion
Dogs	852	106	12.4	1210	127	10.5	1268	182	14.4	1710	862	50.4	2560	294	11.5
Cats	310	37	11.9	347	68	19.6	428	69	16.1	485	289	59.6	648	109	16.8
Total	1162	143	12.3	1557	195	12.5	1696	251	14.8	2195	1151	52.4	3208	403	12.6

Source: Veterinary Services Department, Sawla-Tuna-Kalba District

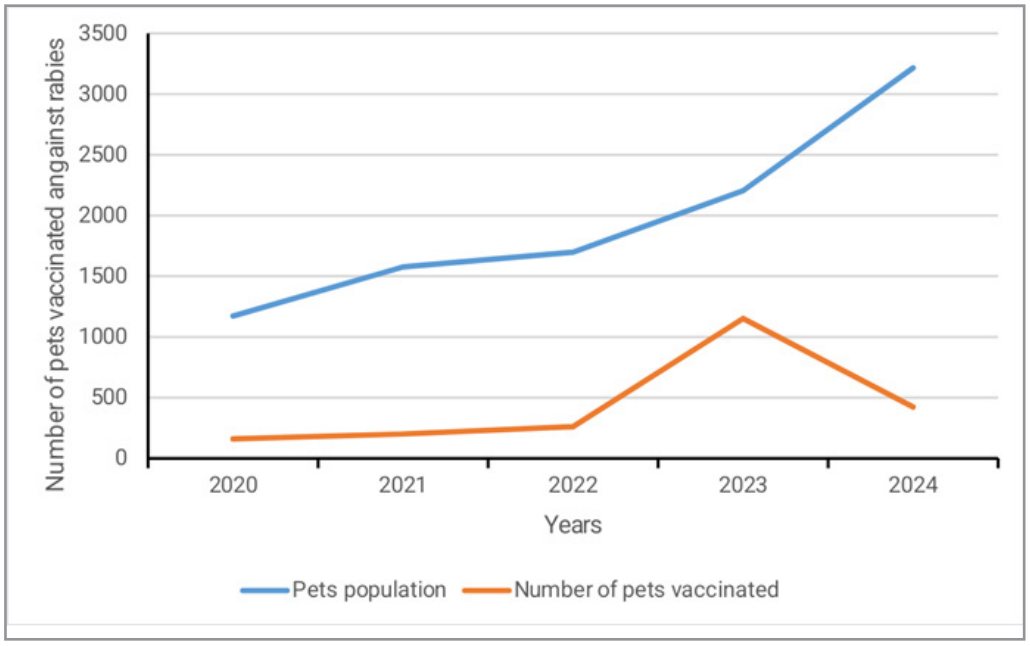

Figure 2: Trend of Vaccination Pets Against Rabies, Sawla-Tuna-Kalba District

An increase in vaccination of pets is possibly as result of the following:

- Increase in number of veterinary officers in STKD
- Free vaccination campaign in 2023
- Increasing awareness of rabies

Data Collection Tool

A structured interview guide and observation were used for data collection. Monthly reports, field note books and Anti-Rabies Certificate were used as a verification tools [18-22].

Data Analysis

FISHBONE analysis diagram was used to summarize the findings from the data collected.

Fishbone Analysis (Conceptual Framework)

The conceptual framework (Fig 2.0) represents the roadmap for achieving the main objective of the study. The conceptual framework establishes a linkage between the general causes of rabies and causes that are specific to the research area. It also examines the presence of the disease within the area and its severity. Further, the framework considers the control measures that farmers are using and their willingness to keep to vaccination which is the accepted remedy to the disease. Finally, the reasons why some farmers do not vaccinate their pets are also determined.

Possible Causes of Limited Proportion of Vaccination of Pets Against Rabies in STKD

- Inadequate veterinary staff in the district
- Pets' owner's belief about vaccination in the district
- Availability of vaccines in the district
- Visibility of veterinary office

Table 3: The Legend Below Assigning the Degree of Control in the Fishbone Analysis

T	Totally within your control to improve
P	Partially within your control
N	Not in your control

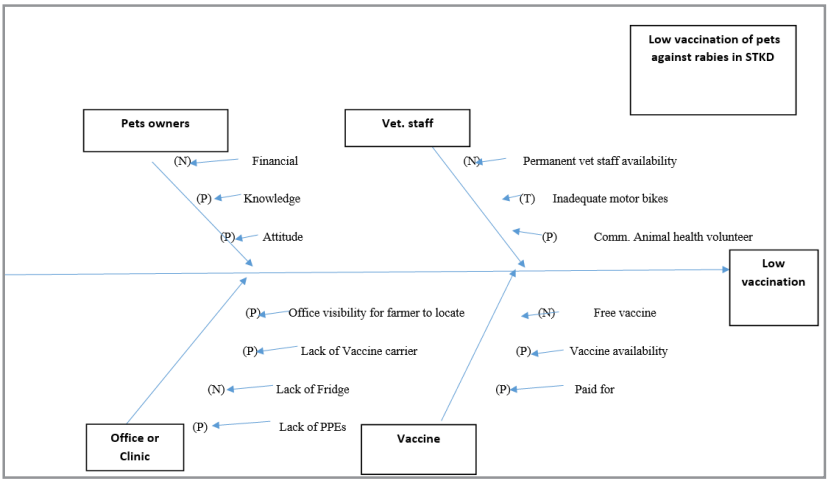

Figure 3: Low vaccination Coverage of Pets Against Rabies in Sawla-Tuna-Kalba District

Results

Knowledge of Pets' Owners

Out of the 100 respondents interviewed, 100 (100 %) of them have knowledge on rabies vaccination.

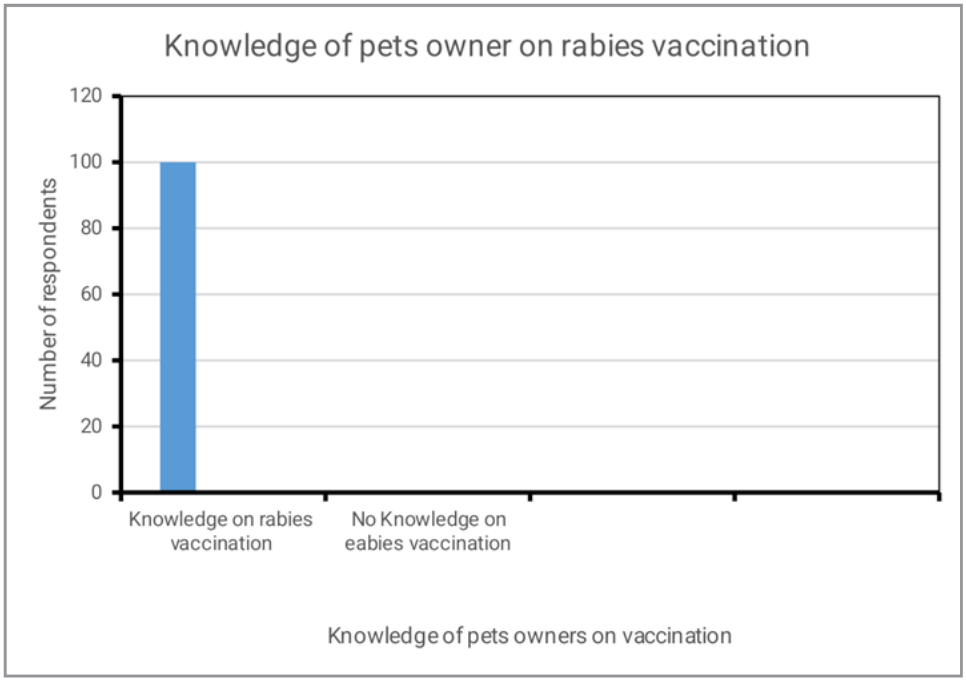

Figure 4: Knowledge of Pets Owners on Rabies Vaccination

Cost of Vaccination

Pet owners were asked what they thought about the cost of vaccination charged by veterinary officers. There was no significant difference ($P > 0.05$) among the responses of pet owners. 55 % of the respondents said the cost of vaccination is too expensive whiles the remaining 45 % said it is affordable [23-25].

The cost of vaccination impacted farmers' decision to vaccinate their pets. A good number of pet owners said vaccination was too expensive. The result confirms a study by Awuni et al., 2019 who reported that although there is no documented standard price for anti-rabies vaccination of dogs in Ghana, information from the veterinary division of the Ministry of Agriculture revealed that a shot of anti-rabies vaccine can cost up to $4 per dog. This places huge financial burden on dog owners, especially in a country where 23.4% of the population live on less than $1 a day (GSS, 2017).

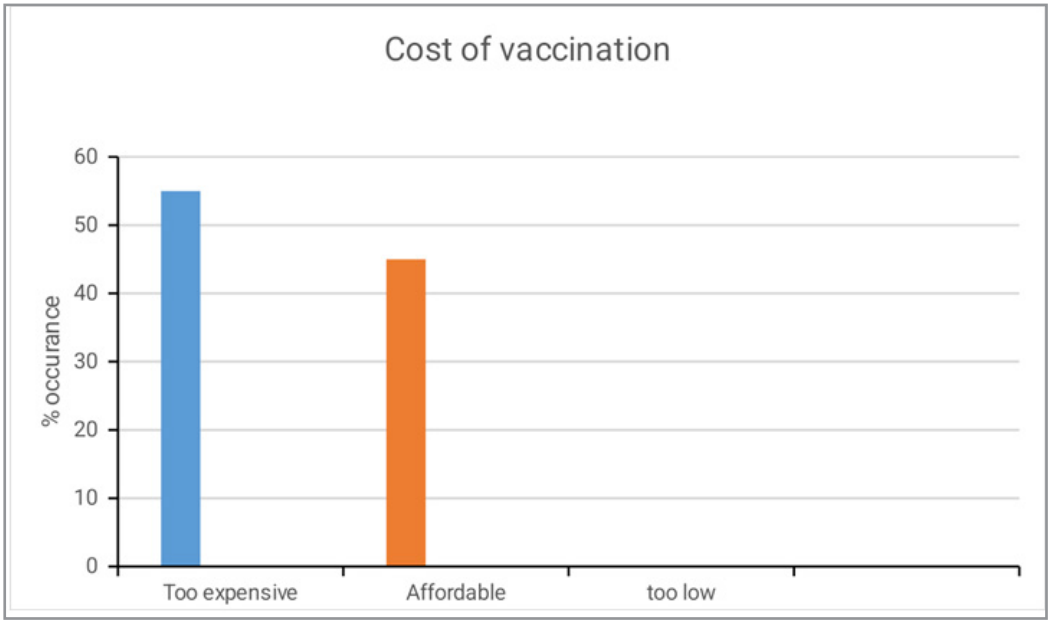

Figure 5: Cost of Vaccination

Sourcing Information on Rabies

Table 2.0 indicates that pet owners mainly sourced information on rabies from veterinary officers (45), Neighbors (40), media (15).

The source of pet owners' information on rabies is a probable factor for vaccination. Vet. Officers are more likely to explain better subject of vaccination to pet owners than other sources. Pet owners who received information about rabies from vet. Officers are more likely to vaccinate their pets [26].

Table 4: Respondents' Sources of Information on Rabies

Vet. Officers	Media	Neighbors
45	15	40
45 %	15 %	40 %

Challenges

- Inadequate motor bikes to access remote communities
- Inadequate fuel allowance to carry out vaccination exercise
- Lack of storage facilities e.g. fridge for storage of vaccines
- High of cost of anti-rabies vaccines
- Inadequate knowledge on rabies by farmers

Conclusion

The fishbone analysis provided the opportunity to assess low Rabies vaccination coverage of pets in STKD. It was identified that financial status, knowledge and attitude of pets' owners on rabies is low, which contribute significantly on vaccination of pets. There was availability of vaccines, but high cost of vaccines was the root cause of low vaccination rates. Farmers who are willing and capable to pay for the vaccination find it difficult to locate veterinary clinic or veterinarian. No allowance for vaccination exercise [27].

Recommendations

- The government of Ghana should employ more veterinarians.
- The Veterinary Services Department (VSD) should solicit for funds from Non-Governmental. Organizations (NGOs) to carry out free vaccination of pets against rabies.
- The Ministry of Food and Agriculture and VSD should provide fully equipped veterinary clinic in STKD.
- VSD should provide motor bikes to veterinary officers.
- Government should subsidize anti-rabies vaccines for farmers to afford.
- VSD should sensitize pets' owners on rabies.

Public Health Actions Taken

- Orientation of newly recruited veterinary officers on vaccination of pets and livestock.
- Sensitization of pets' owners on vaccination of pets against rabies.

Figure 6: Orientation of Veterinary Officers on Vaccination of Pets Against Rabies, STKD, October 2024.

Figure 7: Sensitization if Farmers on Vaccination of Pets Against Rabies, Community Kalba, Sawla-Tuna-Kalba District, October 2024.

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