DOI https://doi.org/10.5281/zenodo.10049652#82

TWIST, 2024, Vol. 19, Issue 1, pp. 187-195

TWIST

Journal homepage: www.twistjournal.net

Policy Checking on the Implementation of Republic Act 9482, Sec. 7 (Anti-Rabies Act of 2007) in the Province of Davao del Sur, Philippines

Aia Sept C. Franco
Department of Teacher Education, UM Digos College, University of Mindanao, Digos, Philippines
ORCID: https://orcid.org/0009-0007-6157-3477

Stephen Josh E. Parreño
Department of Teacher Education, UM Digos College, University of Mindanao, Digos, Philippines
ORCID: https://orcid.org/0009-0009-3242-8128

Christine P. Buyco
Department of Teacher Education, UM Digos College, University of Mindanao, Digos, Philippines
ORCID: https://orcid.org/0009-0002-5277-4692

Tomas Jr A. Diquito*
Department of Teacher Education, UM Digos College, University of Mindanao, Digos, Philippines
ORCID: https://orcid.org/0000-0002-6473-5722
[*Corresponding author]

Abstract
This study assesses the implementation of Republic Act 9482, otherwise known as the Anti-Rabies Act of 2007, Section 7, which highlights the responsibilities of the local government unit (LGU), in the province of Davao del Sur, Philippines. The analysis encompasses diverse dimensions such as dog immunization and registration, dog impounding activities, field control, dog pound establishment, euthanasia procedures, veterinary office presence, and pet shop requirements. Through the use of descriptive research, variables were quantified in numerical terms. The data revealed that all municipalities and the component city in the province engage in dog immunization, but differences arise in program frequency, methodologies, and outcomes. Similarly, dog registration practices exhibit disparities in terms of frequency. Six out of ten entities undertake field control interventions, focusing primarily on castration. Notably, only the component city of the province possesses a dog pound. The presence of veterinary offices with licensed veterinarians varies, and a few municipalities enforce pet shop requirements. This study underscores the intricacies of rabies prevention policy implementation. In light of the findings, it is recommended that local authorities collaborate to establish a centralized database for dog-related activities, promote the adoption of best practices across municipalities, and strengthen veterinary services.

Keywords
Policy checking, Local government unit, Anti-rabies, Dog pound, Animal welfare, Pet shops, Dog registration

BACKGROUND OF THE STUDY

Millions of individuals in developing nations are at risk from rabies. Thousands of rabies victims die every year despite the disease being preventable with a vaccine (Dimaano et al., 2011). Rabies strains of the virus are the predominant concern in many developing countries, such as Asia and Africa (Rupprecht et al., 2008). In the Philippines, the majority of human rabies cases arise from injuries associated with dogs, such as bites and scratches (Quiambao et al., 2009). Despite a widespread attempt to eradicate this viral disease, rabies is still a public health concern (Lachica et al., 2019). The Department of Health's Rabies Prevention Program aims to declare the Philippines as a rabies-free country by 2022;

however, between January 1 and October 1 of 2022, 284 rabies cases and fatalities were reported to the Department of Health (DOH). According to Lachica et al. (2019), the goal of eliminating rabies is challenged by the country's fluctuating reported rabies cases, which persist despite the deployment of different interventions including the Anti-rabies act of 2007 (R.A 9482). Due to this alarming number of rabies cases, the researchers wanted to conduct policy checking in terms of the implementation of the Republic Act 9482, Section 7 to assess the compliance of the LGU of the municipalities and component city of Davao del Sur to see if anti-rabies preventions are enacted.

In recent years, the importance of improving anti-rabies laws has become more apparent on a global scale. Strengthening these laws can help break the transmission cycle and protect both human and animal populations. According to Steffen and Hamer (2020), there has been a notable surge in rabies cases and fatalities worldwide. It is estimated that this viral disease leads to an annual loss of 59,000 human lives (Hampson et al., 2015), with 50% of these fatalities being children under the age of 15, primarily in Asia and Africa (Hampson, 2015). Asia alone accounts for more than 35,000, or 58%, of the 59,000 annual rabies-related deaths worldwide (Acharya, 2021). This alarming figure sparked a collaboration among prominent organizations, including the World Health Organization, the Food and Agriculture Organization of the United Nations, and the World Organization for Animal Health, in 2018 (World Health Organization, 2018). Their joint efforts are directed at strengthening countries in their efforts to accelerate measures aimed at eliminating human deaths caused by rabies transmitted by dogs by the year 2030.

Since then to the present day, rabies has persisted as a serious problem, necessitating continued attention, research, and intervention. The study conducted by Mani et al. (2016) stated that a national multicentric epidemiological survey conducted in 2003 projected about 20,000 human deaths every year in India, and previous studies claimed that one-third of the annual global burden of rabies occurs in India (Brookes et al., 2018). Between 2005 and 2020, China recorded 24,319 cases of human rabies (Yue et al., 2022). According to the study of Yin et al. (2013), China is considered a high-risk environment for rabies, second only to India in terms of linked deaths, where dogs remain a reservoir of disease transmission to humans. Each year in Mexico City, the official Public Health Institution euthanizes 7,000 stray dogs, since between 2000 and 2008, there were about 100,000 dog attacks on people in Mexico (Arechiga Ceballos et al., 2014). Thailand, on the other hand, recorded 1,706 canine rabies cases from the year 2012 to 2017 (Kanankege et al., 2022). In Vietnam, 4,234 cases of human rabies deaths were reported between 1991 and 2018 (Pham et al., 2021). However, in Cambodia, data on dog population characteristics are lacking, and there is no canine vaccination program, no validated strategy, no funding, and insufficient expertise dedicated to eradicating canine rabies (Chevalier et al.,2021; Tarantola et al., 2015).

In the Philippines, rabies is considered as a neglected tropical disease (NTD) (Leonardo et al., 2020). While rabies preventive and control initiatives are being carried out throughout the Philippines, only a small number of islands and provinces are on pace to achieve the elimination of both human and canine rabies (Miranda et al., 2017). Canine rabies continues to be a serious public health issue, with 200–300 people dying from the disease each year, despite continued efforts by the national government to stop transmission and prevent the disease (Rysava et al., 2019). Between January 1 and February 25 of 2023, the Philippines has documented a total of 55 instances of rabies, all resulting in fatalities, as officially reported by the Department of Health. This figure signifies an 8 percent increase compared to the 51 cases recorded during the corresponding period in the previous year.

Davao City, one of the country's largest cities with around 163,000 canines, initiated a comprehensive mass vaccination program for its canine population in 2006. Additionally, control measures, including impounding and neutering of free-roaming dogs, have been in effect since 2011. However, incidence of human rabies cases in the city has not significantly decreased in recent years (Lachica et.al, 2019). In a study conducted by San Jose, R., Magsino, P. J., & Bundalian Jr, R. (2019) entitled Assessment of the Local Government Unit (LGU) Compliance to the Anti-Rabies Act of 2007 (RA 9482) in Magalang, Pampanga, the findings revealed that the local government unit showed non-compliance with most of the provisions outlined in the Anti-Rabies Act during the assessment. Specifically, the local government unit lacked essential data on aspects such as the population of dogs and cats, registration and impounding procedures, and records of collected fines. Furthermore, no measures were in place to prohibit the trade of dog meat or ensure that pet shops and animal clinics displayed information on rabies and responsible pet ownership. The local government unit also failed to allocate funds for infrastructure, manpower, and information and education campaigns (IEC) focused on rabies prevention.

The study aims to meticulously assess the adherence and effectiveness of the policies outlined in Section 7 of Republic Act 9482 within the municipalities and component city of Davao del Sur. By focusing on this specific region and the mentioned section of the Act, the research endeavors to shed light on various dimensions of policy execution and its implications. The significance of this study can be outlined as follows: (1) Policy Evaluation and Compliance: The research delves into local government units (LGUs) compliance within Davao del Sur with the stipulations laid out in Section 7 of RA 9482. By examining how well these policies are being implemented, the study offers insights into the capacity of local government units to align their actions with the law's intent. (2) Public Health and Safety: The study's focus on a specific public health and safety provision underscores its relevance in safeguarding the population's well-being. By critically analyzing the execution of rabies control policies, the research contributes to enhancing public health initiatives and protecting against potential health risks. (3) Local Governance Effectiveness: Through a thorough assessment of local government units' adherence to Section 7, the study highlights the efficiency and efficacy of local governance structures in Davao del Sur. The findings can assist policymakers in refining administrative practices and

allocating resources more effectively. (4) Policy Recommendations: The research provides a platform for proposing actionable recommendations by identifying gaps or challenges in policy implementation. These suggestions can assist policymakers in refining and strengthening policies, leading to more efficient and comprehensive public service delivery.

THEORETICAL LENS

This research paper employs the Principal-Agent Theory to examine the dynamics of compliance with Section 7 of Republic Act 9482 within the municipalities and component city of Davao del Sur. The principal-agent literature focuses on a particular social relationship, namely delegation, where two individuals engage in the exchange of resources (Braun and Guston, 2003). This theory is often attributed to scholars like Jensen & Meckling (1976), it is a framework that helps understand how one entity, called the principal, delegates tasks or responsibilities to another entity, known as the agent, and how their relationship affects decision-making and outcomes. The principal-agent theory has gained widespread acceptance as a versatile framework for assessing public accountability, primarily due to its ability to model diverse institutional arrangements and evaluate their capacity to encourage desirable agent behavior.

This theory is particularly relevant in situations where the principal relies on the agent to carry out specific actions on their behalf, while the agent might have their own interests and motivations. Through this theory, the research offers insights into the factors that influence the alignment of local government actions with legislative mandates. Effective policy implementation requires local government units to be reliable agents in carrying out the mandates of higher legislative authorities. The study examined the extent to which local government units comply with Section 7 policies. Applying the insights of the Principal-Agent Theory, this research contributes to understanding the complex interplay between higher legislative authorities and local government units in policy compliance. The study not only provides insights into the dynamics of policy alignment but also offers recommendations for optimizing the principal-agent relationship to enhance policy adherence in Davao del Sur. By incorporating the Principal-Agent Theory in the research, this will provide a framework to explore the relationship dynamics that shape policy compliance among local government units. This theory allows the researchers to delve into issues of accountability, incentives, and monitoring mechanisms that influence the execution of RA 9482, Section 7 policies.

RESEARCH OBJECTIVES

To determine the implementation of R.A 9482, Section 7 in the municipalities of Davao del Sur as stipulated in;

1.1. Article 1 (Dog Immunization and Registration)
1.2. Article 2 (Dog Impounding Activities and Field Control)
1.3. Article 8 (Established Dog Pound)
1.4. Article 9 (Euthanasia Procedure)
1.5. Article 10 (Established Veterinary Office with Licensed Veterinarian)
1.6. Article 11 (Pet Shop Requirement)

METHOD

Research Locale

Davao del Sur is a province in the southern region of Mindanao, Philippines, comprising several municipalities of research interest (Fig. 1 for the location of Davao del Sur in Mindanao, Philippines). With a population exceeding 850,000 people, the province is known for its natural beauty, including lush forests and pristine beaches. It is also home to the iconic Mount Apo, the Philippines' highest peak, providing opportunities for adventure and eco-tourism. The province has a thriving agriculture sector, particularly in the production of bananas, coconuts, and various fruits.

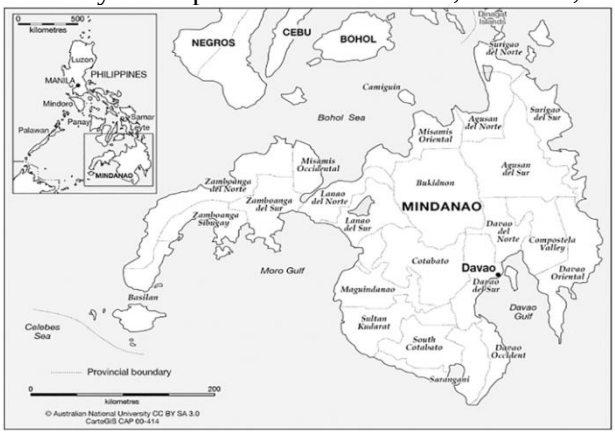

Fig. 1 Map of Mindanao (***Source***: Australian National University, n.d.)

The province has nine (9) municipalities and one (1) component city (Fig. 2). The whole province is the target subject of this study, specifically the veterinary and agricultural offices of each municipality. Digos City, the provincial capital, is the economic and administrative center known for its diverse economy, including agriculture, trade, services, durian and pomelo production. Across the province, municipalities like Bansalan in the east focus on agriculture and offer attractions like Mount Apo National Park, while Hagonoy in the west thrives on rice, corn, coconut farming, and boasts cultural and historical sites. Malalag, located along the coast in the south, centers its economy around agriculture, aquaculture, and

fishing, complemented by scenic coastal areas. Matanao in the north excels in various crop cultivation and holds an annual Banana Festival. Santa Cruz in the east, near Davao City, is a part of the metropolitan area with a diverse economy. Sulop in the central region relies on agriculture, particularly rice, corn, and coconuts, reflecting its rural character, and Padada in the southwest is rooted in agriculture, offering insights into rural life in the province. Kiblawan, positioned in the western region of Davao del Sur, Philippines, is recognized for its predominant engagement in agricultural pursuits, wherein farming plays a pivotal role as a primary economic catalyst, contributing substantially to the local economy. Magsaysay, a municipality landlocked within the coastal province of Davao del Sur, is distinguished by its dependency on agriculture, specifically centered on farming practices.

Fig. 2 Map of Davao del Sur *(**Source**: PhilAtlas)*

Research Instrument

The study utilized a self-made checklist in accordance with Republic Act 9482 or the Act providing for the control and elimination of human and animal rabies, specifically, Article 7, which is the responsibility of the local government unit (LGU). Two (2) experts verified the self-made checklist for the study to be trustworthy and ethical. The primary tool used to carry out the study was the developed checklist. The self-made checklist specifically focus on: 1. Section 7, Article 1 (Dog Immunization and Registration)***;*** 2. Section 7, Article 2 (Dog Impounding Activities and Field Control)***;*** 3. Section 7, Article 8 (Established Dog Pound)***;*** 4. Section 7, Article 9 (Euthanasia Procedure)***;*** 5. Section 7, Article 10 (Established Veterinary Office)***;*** 6. Section 7, Article 11 (Pet Shop Requirement)

Design and Procedure

This study used Descriptive Quantitative Research. Quantitative descriptive research aims to clarify established phenomena by utilizing numerical data to depict the characteristics of individuals or groups (Sidel et al., 2018). This design is ideal for measuring compliance with specific policy provisions, offering objectivity, and allowing data comparisons between local government units. It also facilitates quantifying outcomes and applying statistical analysis to identify significant findings, ultimately providing a strong foundation for evidence-based policy recommendations. Moreover, to carry out the objectives of this study, the following procedures were carried out: *First*, the researchers designed the checklist as the main instrument for this study according to the aforementioned research objectives. *Second*, the checklist was validated by two (2) professionals who reviewed it for ethical considerations and reliability. *Third*, researchers wrote to the Office of the College Dean and the Research and Publications Office of the University of Mindanao-Digos to request permission to conduct the study. The *fourth step* included the researchers sending an official letter to the City Hall and the Municipality buildings for each municipality and component city in Davao del Sur, Philippines. In the *fifth step*, the survey phase, the researchers conducted surveys to collect data for this study after receiving permission from the responsible party. This study was conducted in the year 2023, specifically in the months of January to November 2023; *finally*, the retrieval of the research instrument: After interviewing all selected respondents, all checklists were collected for data analysis.

Ethical Considerations

In conducting this study, the researchers followed a set of ethical concerns to safeguard the rights, well-being, and integrity of everyone involved. Given that this study encompasses both policy checking and gathering data from participants, it is crucial to address a variety of fundamental ethical considerations: (1) *Permit to Conduct the Study***:** Before conducting the study, the researchers obtained the necessary authorization from the respective Mayors of each municipality and the component city in Davao del Sur. (2) *Informed Consent:* The researchers thoroughly informed the participants about the purpose of the study, the type of data to be collected, the use of their responses, any potential risks or benefits, and their right to refuse participation or withdraw at any point without consequence. The provision of transparent information ensures that participants make informed and voluntary decisions. (3) *Privacy and Confidentiality:* The researchers guaranteed to protect the anonymity of participants by collecting and storing information that prevents unauthorized access, ensuring that the participant's personal information and responses will not be disclosed

without their consent. (4) *Transparency in Reporting:* The survey findings must be conveyed accurately and objectively. The researchers ensured to present accurate and unbiased results in publications, avoiding selective reporting or exaggeration.

RESULTS AND DISCUSSIONS

Article 1. Dog Immunization and Registration

Matrix 1 shows the data of the municipalities and component city of Davao del Sur in terms of Dog Immunization and Registration as per RA 9482 sec 7, Article 1. Through a comprehensive question-answer format, the data reveals that all nine municipalities and the component city engage in Dog Immunization Programs (Yes=100%). This finding is in line with the previous studies conducted by Shen et al. (2023) and Wang et al. (2023), which highlighted the engagement of most of the cities in China towards compulsory immunization and registration for dogs. Moreover, variations of dog immunization programs vary, where some areas conduct it weekly (n=3, %=30), monthly (n=3, %=30), annually (n=3, %=30), and depending on the availability (n=1, %=10). This finding aligns with the work of Chen et al. (2023), who emphasized that supportive services should be made available, such as arranging schedules, offering home immunization services, and mobile immunization stations. However, a stable supply of dog vaccines varies among areas, wherein 4 out of 10 areas (40%) have a stable supply of dog vaccines while 6 out of 10 areas (60%) don't have a stable supply. The result of this study was supported by Quiambao et al. (2023), who noted that the budget for vaccines in the Philippines was limited and that there was no clear policy on how many doses should be given for free. As for the dog registration program, most areas conducted the registration program (n=6, %=60) while a few areas did not (n=4, %=60). Variations of the conduct of the registration program also vary; some areas conduct it weekly (n=3, %=30), annually (n=2, %=20), and depending on the request (n=1, %=10).

Matrix 1 Data of Dog Immunization and Registration as per R.A 9482 sec 7, Article 1 in Davao del Sur

Questions	Municipalities in Davao del Sur (with one component City)										Summary
	1	2	3	4	5	6	7	8	9	10	
1. Do you conduct Dog Immunization Programs?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes = 10/10 (100%)
2. How often do you conduct Dog Immunization Programs?	A	W	M	W	A	M	M	A	D	W	Weekly = 3/10 (30%) Monthly = 3/10 (30%) Annually = 3/10 (30%) Depends = 1/10 (10%)
3. Do you have a stable supply of Dog Vaccines needed for immunization	No	Yes	No	Yes	No	No	Yes	No	No	Yes	No = 6/10 (60%) Yes = 4/10 (40%)
4. Do you conduct Dog Registration Programs?	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes	No	No = 4/10 (40%) Yes = 6/10 (60%)
5. How often do you conduct Dog Registration Programs?	A	W	No	W	A	No	W	No	D	No	Weekly = 3/10 (30%) Annually = 2/10 (20%) Depends = 1/10 (10%) No = 4/10 (40%)

***Note**: A = Annually; W = Weekly; M = Monthly; D = Depends on Availability/Request*

Article 2. Dog Impounding Activities and Field Control

Matrix 2 shows the dog impounding activities and field control as per R.A 9482, sec. 7 article 2 in Davao del Sur, Philippines. Data shows that most areas in Davao del Sur conduct field control activities (n=6, %=60) to lessen the number of stray dogs. The method that these areas are using is in the form of castration activity (n=6, %=60). Variation of field control activity differs among areas; some conduct monthly (n=2, %=20), annually (n=3, %=30), and some are dependent on the request (n=1, %=10). According to the study of Yuson et al. (2023), stricter population control measures are necessary to lower the occurrence of rabies in the Philippines. Field control activities or management of free-roaming dog populations are essential to reduce the threat of viruses such as rabies and minimize conflict with people, wildlife, and livestock (Yoak et al., 2023).

Matrix 2 Data of Dog Impounding Activities and Field Control as per R.A 9482 sec 7, Article 2 in Davao del Sur

Questions	Municipalities in Davao del Sur (with one component City)										Summary
	1	2	3	4	5	6	7	8	9	10	
1. Do you conduct any field control activities that lessen the population of stray dogs?	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes = 6/10 (60%) No = 4/10 (40%)
1.1 If yes, how do you conduct these activities?	No	C	C	C	No	C	No	C	C	No	Castration = 6/10 (60%) No= 4/10 (40%)
1.2 How often do you do conduct field control activities?	No	PR	M	A	No	A	No	M	A	No	Monthly = 2/10 (20%) Annually = 3/10 (30%) per Request = 1/10 (10%) No = 4/10 (40%)

***Note**: C = Castration; PR = per Request; M = Monthly; A = Annually*

Article 8. Established Dog Pound

Matrix 3 shows the dog pound establishment as per RA 9482 sec 7, article 8 in Davao del Sur, Philippines. Data revealed that at the time of the conduct of this study, the majority of the areas in Davao del Sur don't have a dog pound (n=8, %=80), only one area (n=1, %=10) has a dog pound and another area is now establishing a dog pound (n=1, %=10). Claiming of dogs in the pound requires a payment of ₱250.00 per day (for area with dog pound). However, if the pound dog is not claimed within five (5) days, the dog will be euthanized. In the Philippines, due to a lack of space and resources at local pounds, strays and rescues that are not adopted or claimed are euthanized (Enriquez, 2022).

Matrix 3 Data of Establishment Dog Pound as per R.A 9482 sec 7, Article 8 in Davao del Sur

Questions	Municipalities in Davao del Sur (with one component City)										Summary
	1	2	3	4	5	6	7	8	9	10	
1. Do you have a dog pound in your municipality?	UC	Yes	No	No	No	No	No	No	No	No	Yes = 1/10 (10%) UC= 1/10 (10%) No= 8/10 (80%)
2. Do dog owners have to pay a fee when claiming their impounded dog?	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes = 1/10 (10%) N/A = 9/10 (90%)
2.1 If yes, how much does it cost?	N/A	₱250.00 per day	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1 < = 1/10 (10%) N/A = 9/10 (90%)
3. Do you euthanize the unclaimed dogs?	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y = 1/10 (10%) N/A = 9/10 (90%)
3.1 If yes, how many days does it take for a dog to be euthanized?	N/A	After 3-5 days	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3 < = 1/10 (10%) N/A = 9/10 (90%)

***Note**: UC = Under Construction; N/A = Not Available*

Article 9. Euthanasia Procedure

Matrix 4 shows the data of the municipalities and component city of Davao del Sur in terms of Euthanasia Procedure as per RA 9482 sec 7, Article 9. The data reveals that none of the municipalities, including the component city, employ electrocution as a method to euthanize unclaimed dogs, with all ten entities abstaining from this practice. However, data further reveals that only one area conducts euthanasia for unclaimed dogs (n=1, %=10) while other areas indicate Not Available (NA) since these areas don't have dog pounds at the time this research was conducted (n=9, %=90). Moreover, the mode of neutralization of unclaimed dogs is in the form of medicine (n=1, %=10). Thus, the area adheres to R.A 9482 sec 7 of Article 9 regarding neutralizing unclaimed dogs. The Philippine Animal Welfare Society (PAWS) (2022) expressed opposition to inhumane methods, including electrocution, for ending the suffering of animals. Euthanasia must be a painless process, completed within a minute, to ensure that no animals endure more than a minute of suffering.

Matrix 4 Euthanasia procedure as per R.A 9482 sec 7, Article 8 in Davao del Sur

Questions	Municipalities in Davao del Sur (with one component City)										Summary
	1	2	3	4	5	6	7	8	9	10	
1. Do you use electrocution as a way to euthanize unclaimed dogs?	N/A	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No = 1/10 (10%) N/A = 9/10 (90%)
1.1 If no, how do you euthanize unclaimed dogs?	N/A	Medicine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Medicine=1/10 (10%) N/A = 9/10 (90%)

***Note**: N/A = Not Available*

Article 10. Established a Veterinary Office with a Licensed Veterinarian

Matrix 5 shows data pertaining to Article 10 of R.A 9482, which emphasizes the establishment of a veterinary office with a licensed veterinarian. Data shows that only one (1) area (10%) have a veterinary office in Davao del Sur. In one area, more than fifty (50) personnel work in the veterinary office. Though some areas do not have a veterinary office, they still have a licensed veterinarian. From this, three (3) (30%) areas have a licensed veterinarian while other areas resort with other experts. The agricultural technologists manage the dog immunization and registration in four (4) areas (40%), the veterinarians manage the immunization and registration in three (3) other areas (30%), while the other three areas (3) (30%) let the livestock technician to manage the dog immunization and registration. Veterinary care in the Philippines is generally of a good standard, particularly in urban regions where numerous veterinary clinics and hospitals provide a wide array of services, including routine check-ups and surgery.

However, not all local government units provide these services. Veterinary care in rural areas is less accessible; typically, only first-class cities and municipalities have veterinarians (RA 7160). These services are usually offered through government-operated animal health centers, such as municipal agricultural offices. This issue is particularly pressing given that the total dog population in the Philippines is estimated at 23.29 million (Chaudhari et.al, 2022). In rural regions, the dogs to human ratio is significantly higher, with 256.3 dogs per 1000 people, a figure that exceeds those in semi-rural and urban areas (Chaudhari et.al, 2022). Compounding this issue is the notable shortage of trained

veterinary professionals in the country. With only just over 10,000 licensed veterinarians, as reported by the Philippine Veterinary Medical Association, the ratio stands at approximately one veterinarian to 2,300 dogs. This shortage is particularly challenging for pet owners in less urbanized areas, where finding accessible and quality veterinary care is more difficult.

Matrix 5 Established a Veterinary Office with a Licensed Veterinarian in Davao del Sur as per R.A 9482 sec 7, Article 10

Questions	Municipalities in Davao del Sur (with one component City)										Summary
	1	2	3	4	5	6	7	8	9	10	
1. Do you have a veterinary office in your municipality?	No	Yes	No	No	No	No	No	No	No	No	Y = 1/10 (10%) N = 9/10 (90%)
2. How many personnel are working in the Veterinary office?	N/A	50 +	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1 < = 1/10 (10%) N = 9/10 (90%)
3. Do you have licensed Veterinarian in the office?	No	Yes	Yes	No	No	No	No	No	Yes	No	Y = 3/10 (30%) N = 7/10 (70%)
4. Who manages the dog immunization and registration in your municipality?	AT	V	V	LT	LT	LT	AT	AT	V	AT	AT= 4/10 (40%) V = 3/10 (30%) LT=3/10 (30%)

***Note**: AT = Agriculture Technologist; V = Veterinarian; LT = Livestock Technician; N/A = Not Available*

Article 11. Pet Shop Requirement

Matrix 6 shows the conduct of an information campaign to pet shops in Davao del Sur, Philippines, as per R.A. 9482 sec. 7, Article 11. Data shows that only two (2) (20%) areas conduct information campaigns for pet shops, while eight (8) areas don't conduct information campaigns for pet shops. R.A. 9482 sec. 7, Article 11 clearly stipulates the role of pet shops in anti-rabies campaigns and responsible pet ownership in the country (Republic of the Philippines, 2007). A vital conduit between animals and prospective pet owners was provided by pet stores. This enhances the general well-being of pets and communities while addressing public health and animal welfare issues

Matrix 6 Conduct an Information Campaign to Pet Shops within their Municipality About Rabies and Responsible Pet Ownership as per R.A 9482 sec. 7, Article 11

Question	Municipalities in Davao del Sur (with one component City)										Summary
	1	2	3	4	5	6	7	8	9	10	
1. Do you require pet shops to post information regarding Rabies and Responsible pet ownership?	No	No	No	Yes	No	Yes	No	No	No	No	Yes = 2/10 (20%) No = 8/10 (80%)

CONCLUSION

The comprehensive data analysis across various matrices provides an insightful overview of the implementation of key provisions outlined in Republic Act 9482 section 7 in Davao del Sur, Philippines. The study sheds light on the multifaceted landscape of dog-related programs and regulations within the province. It is evident that while there is a collective commitment to dog immunization, variations exist in program frequency, methodologies, and outcomes. Based on the data gathered, areas (municipalities and component city) in the province have strong dog immunization programs; however, some areas don't conduct dog registration programs and field control activities. The majority of areas in the province don't have dog pound and veterinary offices. Data shows that only one area had established a dog pound and veterinary office at the time this study was conducted. Though the immunization program was carried out in all areas, implementation varies since only three (3) areas have a licensed veterinarian. In addition, posting anti-rabies campaigns and responsible pet ownership is not evident in all areas of the province. Thus, it is concluded that different areas (municipalities and component cities) of Davao del Sur have different procedures for implementing Republic Act 9482, section 7, primarily because of insufficient supplies, lack of facilities, and lack of personnel.

RECOMMENDATION

In light of the findings, it is recommended that Davao del Sur's local authorities collaboratively work to enhance the consistency, transparency, and efficacy of dog-related programs and regulations. Establishing a unified database for dog immunization, registration, and impounding activities, updated regularly, would facilitate comprehensive data-driven decision-making. Encouraging municipalities to adopt best practices, particularly those with successful models, would contribute to harmonizing program execution. Strengthening the establishment of veterinary offices with licensed veterinarians across municipalities could ensure standardized health services for animals. Additionally, creating awareness campaigns to encourage responsible pet ownership and rabies prevention and implementing standardized pet shop requirements would foster a safer and more informed pet culture. Ultimately, harmonizing practices and improving data collection mechanisms would bolster the efficacy of dog-related programs and regulations, benefiting the region's human and animal welfare. This research also has a good implication for law enforcement regarding accidents involving stray dogs.

FUNDING INFORMATION

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

DECLARATION OF CONFLICT

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

REFERENCES

1. Acharya, K. P., Subedi, D., & Wilson, R. T. (2021). Rabies control in South Asia requires a One Health approach. *One Health*, *12*, 100215. https://doi.org/10.1016/j.onehlt.2021.100215
2. Arechiga Ceballos, N., Karunaratna, D., & Aguilar Setien, A. (2014). Control of canine rabies in developing countries: key features and animal welfare implications. *Revue Scientifique et Technique de l'OIE*, *33*(1), 311–321. https://doi.org/10.20506/rst.33.1.2278
3. Australian National University (n.d.). *Mindanao provinces*. https://asiapacific.anu.edu.au/mapsonline/base-maps/mindanao-provinces
4. Braun, D., & Guston, D. H. (2003). Principal-agent theory and research policy: an introduction. *Science and Public Policy*, *30*(5), 302–308. https://doi.org/10.3152/147154303781780290
5. Brookes, V. J., Gill, G. S., Singh, C. K., Sandhu, B. S., Dhand, N. K., Singh, B. B., Gill, J. P. S., & Ward, M. P. (2018). Exploring animal rabies endemicity to inform control programmes in Punjab, India. *Zoonoses and Public Health*, *65*(1). https://doi.org/10.1111/zph.12409
6. Chaudhari, A., Kartal, T., Brill, G., Amano, K. J., Lagayan, M. G., & Jorca, D. (2022). Dog Ecology and Demographics in Several Areas in the Philippines and Its Application to Anti-Rabies Vaccination Programs. *Animals*, *12*(1), 105. https://doi.org/10.3390/ani12010105
7. Chen, R., Zeng, Y., Deng, Z., Liu, H., Chen, M., & Liang, Y. (2023). Optimizing Dog Rabies Vaccination Services to the Public: A Discrete Choice Experiment in Guangdong, China. *Animals*, *13*(11), 1767. https://doi.org/10.3390/ani13111767
8. Chevalier, V., Davun, H., Sorn, S., Ly, P., Pov, V., & Ly, S. (2021). Large scale dog population demography, dog management and bite risk factors analysis: A crucial step towards rabies control in Cambodia. *PLOS ONE*, *16*(7), e0254192. https://doi.org/10.1371/journal.pone.0254192
9. Dimaano, E. M., Scholand, S. J., Alera, M. T. P., & Belandres, D. B. (2011). Clinical and epidemiological features of human rabies cases in the Philippines: a review from 1987 to 2006. *International Journal of Infectious Diseases*, *15*(7), e495–e499. https://doi.org/10.1016/j.ijid.2011.03.023
10. Enriquez, M. (2022). Partners, not pounds: There is more to animal welfare than rounding up strays. Philstar.com.https://www.philstar.com/headlines/2022/11/03/2221272/partners-not-pounds-there-more-animal-welfare-rounding-strays
11. Hampson, K., Coudeville, L., Lembo, T., Sambo, M., Kieffer, A., Attlan, M., Barrat, J., Blanton, J. D., Briggs, D. J., Cleaveland, S., Costa, P., Freuling, C. M., Hiby, E., Knopf, L., Leanes, F., Meslin, F.-X., Metlin, A., Miranda, M. E., Müller, T., … Dushoff, J. (2015). Correction: Estimating the Global Burden of Endemic Canine Rabies. *PLOS Neglected Tropical Diseases*, *9*(5), e0003786. https://doi.org/10.1371/journal.pntd.0003786
12. Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360. https://doi.org/10.1016/0304-405X(76)90026-X
13. Lachica, Z. P. T., Evangelio, S. A., Diamante, E. O., Clemente, A. J., Peralta, J. M., Murao, L. A. E., ... & Alviola IV,
14. Kanankege, K. S. T., Errecaborde, K. M., Wiratsudakul, A., Wongnak, P., Yoopatthanawong, C., Thanapongtharm, W., Alvarez, J., & Perez, A. (2022). Identifying high-risk areas for dog-mediated rabies using Bayesian spatial regression. *One Health*, *15*, 100411. https://doi.org/10.1016/j.onehlt.2022.100411
15. Leonardo, L., Hernandez, L., Magturo, T. C., Palasi, W., Rubite, J. M., de Cadiz, A., Moendeg, K., Fornillos, R. J., Tabios, I. K., Mistica, M., & Fontanilla, I. K. (2020). Current status of neglected tropical diseases (NTDs) in the Philippines. *Acta Tropica*, *203*, 105284. https://doi.org/10.1016/j.actatropica.2019.105284
16. Mani, R. S., Anand, A. M., & Madhusudana, S. N. (2016). Human rabies in India: an audit from a rabies diagnostic laboratory. *Tropical Medicine & International Health*, *21*(4), 556–563. https://doi.org/10.1111/tmi.12669
17. Miranda, L. M., Miranda, M. E., Hatch, B., Deray, R., Shwiff, S., Roces, M. C., & Rupprecht, C. E. (2017). Towards Canine Rabies Elimination in Cebu, Philippines: Assessment of Health Economic Data. *Transboundary and Emerging Diseases*, *64*(1), 121–129. https://doi.org/10.1111/tbed.12350
18. Pham, Q. D., Phan, L. T., Nguyen, T. P. T., Doan, Q. M. N., Nguyen, H. D., Luong, Q. C., & Nguyen, T. V. (2021). An Evaluation of the Rabies Surveillance in Southern Vietnam. *Frontiers in Public Health*, *9*. https://doi.org/10.3389/fpubh.2021.610905
19. PhilAtlas. (n.d). Davao del Sur. https://www.philatlas.com/mindanao/r11/davao-del-sur.html
20. Philippine Animal Welfare Society. (2022). Euthanasia is the humane means of ending the suffering of an animal. Retrieved from: https://paws.org.ph/euthanasia/
21. Quiambao, B. P., Dizon, T. J. R., Grande, N. P., & Gutierrez Miranda, M. E. (2023). Animal Bite Treatment Centres in the Philippines: Functions and Challenges Experienced in the Delivery of Rabies Post-exposure Prophylaxis. In *One Health for Dog-mediated Rabies Elimination in Asia* (pp. 60–73). CABI. https://doi.org/10.1079/9781800622975.0006
22. Quiambao, B. P., Dy-Tioco, H. Z., Dizon, R. M., Crisostomo, M. E., & Teuwen, D. E. (2009). Rabies post-exposure prophylaxis with purified equine rabies immunoglobulin: One-year follow-up of patients with laboratory-confirmed category III rabies exposure in the Philippines. *Vaccine*, *27*(51), 7162–7166. https://doi.org/10.1016/j.vaccine.2009.09.036
23. Republic of the Philippines. (2007). Republic Act No. 1982. https://lawphil.net/statutes/repacts/ra2007/ra_9482_2007.html

24. Rupprecht, C. E., Barrett, J., Briggs, D., Cliquet, F., Fooks, A. R., Lumlertdacha, B., Meslin, F. X., Müler, T., Nel, L. H., Schneider, C., Tordo, N., & Wandeler, A. I. (2008). Can rabies be eradicated?. *Developments in biologicals*, *131*, 95–121. https://pubmed.ncbi.nlm.nih.gov/18634470/
25. Rysava, K., Espineda, J., Silo, E. A. V., Carino, S., Aringo, A. M., Bernales, R. P., Adonay, F. F., Tildesley, M. J., & Hampson, K. (2022). One Health Surveillance for Rabies: A Case Study of Integrated Bite Case Management in Albay Province, Philippines. *Frontiers in Tropical Diseases*, *3*. https://doi.org/10.3389/fitd.2022.787524
26. San Jose, R., Magsino, P. J., & Bundalian, R. (2019). Pet owners' awareness on RA 9482 (Anti-Rabies Act of 2007) in Magalang, Pampanga Philippines. *Heliyon*, *5*(5), e01759. https://doi.org/10.1016/j.heliyon.2019.e01759
27. Shen, T., Welburn, S. C., Sun, L., & Yang, G.-J. (2023). Progress towards dog-mediated rabies elimination in PR China: a scoping review. *Infectious Diseases of Poverty*, *12*(1), 30. https://doi.org/10.1186/s40249-023-01082-3
28. Sidel, J. L., Bleibaum, R. N., & Tao, K. W. C. (2018). Quantitative Descriptive Analysis. In *Descriptive Analysis in Sensory Evaluation* (pp. 287–318). Wiley. https://doi.org/10.1002/9781118991657.ch8
29. Steffen, R., & Hamer, D. H. (2020). High time to prioritize rabies prevention—a new paradigm. *Journal of Travel Medicine*, *27*(7). https://doi.org/10.1093/jtm/taaa173
30. Tarantola, A., Ly, S., In, S., Ong, S., Peng, Y., Heng, N., & Buchy, P. (2015). Rabies Vaccine and Rabies Immunoglobulin in Cambodia: Use and Obstacles to Use. *Journal of Travel Medicine*, *22*(5), 348–352. https://doi.org/10.1111/jtm.12228
31. Wang, Z., Liu, Q., Mei, L., Guo, J., Gao, X., Zhang, B., Cai, C., Sun, Y., Feng, X., & Wang, Y. (2023). Risk factors and molecular epidemiology of canine rabies in Beijing. *One Health Advances*, *1*(1), 18. https://doi.org/10.1186/s44280-023-00018-8
32. World Health Organization. (2018). Zero by 30: The global strategic plan to end human deaths from dog-mediated rabies by 2030. https://www.who.int/publications-detail-redirect/9789241513838
33. Yin, W., Dong, J., Tu, C., Edwards, J., Guo, F., Zhou, H., Yu, H., & Vong, S. (2013). Challenges and needs for China to eliminate rabies. *Infectious Diseases of Poverty*, *2*(1), 23. https://doi.org/10.1186/2049-9957-2-23
34. Yoak, A. J., Calinger, K. M., & Hiby, E. (2023). Assessing multiple free-roaming dog control strategies in a flexible agent-based model. *Scientific Reports*, *13*(1), 19826. https://doi.org/10.1038/s41598-023-47076-x
35. Yue, Y., Chen, Q., Mu, D., Li, Y., & Yin, W. (2022). A Descriptive Analysis of Human Rabies in Mainland China, 2005–2020. *International Journal of Environmental Research and Public Health*, *20*(1), 380. https://doi.org/10.3390/ijerph20010380
36. Yuson, M., Manalo, D. L., Miranda, M. E. G., Hampson, K., & Telmo, S. (2023). Rabies in the Greater Manila Area and Region IV-B of the Philippines and the Potential Impact of Age-targeted Dog Vaccination. In *One Health for Dog-mediated Rabies Elimination in Asia* (pp. 99–114). CABI. https://doi.org/10.1079/9781800622975.0009