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Stray Dogs in Türkiye: A Health Needs Assessment Proposal for Rabies Elimination

Türkiye'deki Sokak Köpekleri: Kuduz Hastalığının Eliminasyonu için Bir Sağlık İhtiyaç Değerlendirmesi Önerisi

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Abstract

This review article presents a comprehensive proposal for a Health Needs Assessment (HNA) aimed at eliminating rabies in Türkiye, with a focus on the country's growing population of stray dogs. It highlights the increasing numbers of unowned dogs in urban areas and the associated public health risks, including rabies transmission and dog attacks. The review emphasizes the importance of systematic data collection on the population, living conditions, and vaccination status of stray dogs, and the need for effective strategies to manage these animals. The proposed HNA involves collaboration with a consortium of stakeholders and utilizes frameworks and approaches such as Cavanagh and Chadwick's 5-stage HNA framework and Stevens & Gillam's approaches for conducting an HNA. The review outlines a detailed methodology structured into three work packages, focusing on epidemiological data production, identifying unmet health needs, and developing a national strategic rabies elimination plan. It discusses challenges such as consortium formation, data availability, stakeholder engagement, and cultural sensitivity, highlighting the impact and importance of the HNA in addressing rabies and stray dog management in Türkiye.

Keywords Consortium collaboration, health needs assessment, rabies elimination, stray dogs

Öz

Bu derleme, Türkiye'de kuduz hastalığının eliminasyonunu amaçlayan ve ülkenin artan sahipsiz sokak köpek nüfusuna odaklanan bir Sağlık İhtiyaç Değerlendirmesi (SİD) önerisi sunmaktadır. Kentsel alanlarda sahipsiz sokak köpeklerinin sayısındaki artışa ve kuduz bulaşı ve köpek saldırıları da dahil olmak üzere ilgili halk sağlığı risklerine dikkat çekilmektedir. Sahipsiz sokak köpeklerinin kontrolsüz artan nüfusu, yaşam koşulları ve aşılanma durumları hakkında sistematik veri toplamanın önemini ve bu hayvan popülasyonunu ve ilişkili riskleri yönetmek için etkili stratejilere duyulan ihtiyacı vurgulanmaktadır. Sağlık İhtiyaç Değerlendirmesi metodolojisi Bergen modeli ile bir paydaş konsorsiyumu ile iş birliğini içermekte ve Cavanagh ve Chadwick'in 5 aşamalı SİD çerçevesi ve Stevens & Gillam'ın Sağlık ihtiyaç analizi yürütme yaklaşımları gibi çerçeve ve yaklaşımları kullanmaktadır. Derlemede epidemiyolojik veri üretimine, sağlık ihtiyaçlarının belirlenip sınıflandırılmasına, önceliklendirilmesine ve ulusal stratejik kuduz eliminasyon planının geliştirilmesine odaklanan üç iş paketi halinde yapılandırılmış ayrıntılı bir metodolojinin ana hatlarını çizmektedir. Konsorsiyum oluşturma, veri mevcudiyeti, paydaş katılımı ve kültürel duyarlılık gibi zorluklar tartışılmakta ve Sağlık ihtiyaç analizinin Türkiye'de kuduz ve başıboş köpek yönetiminin ele alınmasındaki etkisi ve önemi vurgulanmaktadır.

Anahtar Kelimeler *Konsorsiyum iş birliği, sağlık ihtiyaç değerlendirmesi, kuduz eliminasyonu, sahipsiz sokak köpeği*

GİRİŞ

Stray animals, primarily dogs and cats, are those without a fixed home or owner's supervision, often found wandering outside human residences.[1] These animals, particularly prevalent in urban and rural areas, exist independently of direct human care. The population of stray dogs in Turkey has been on the rise, leading to increased struggles for survival in harsh street environments.[2] This escalation in their numbers, juxtaposed with shrinking resources due to human population growth, has led to dire conditions for these animals. They often face hunger and thirst, and in their quest for scarce resources, pose potential health and safety risks to humans and other animals.[3]

The challenges posed by unowned dogs living on the streets include threats to human health and safety through potential aggression or disease transmission, environmental pollution due to waste, traffic accidents resulting in injuries or fatalities, noise pollution, and increased healthcare expenses, particularly for Rabies vaccinations and loss of workforce productivity.[4] Globally, there are an estimated 1 billion dogs, with about 75% being ownerless, as reported by the World Health Organization and World Animal Protection International.[5–7]

In Türkiye, the issue of unowned dogs is particularly acute in urban areas such as Istanbul, Ankara, and Izmir, with their numbers surpassing local populations in some districts. For instance, in Istanbul, estimates indicated 130,000 stray dogs in 2016 [8] and in Ankara, the number exceeded 100,000 in 2008[9] and the numbers continues to rise.[10] Although there was no scientific research or evidence on that, the estimation of the current population of unowned dogs is 10 million in the country.[11]

Stray Dog Attacks and Bites

Although there are not official statistics provided and presented, incidents of stray dog attacks in Türkiye, particularly since 2000, have raised serious public concerns. There is a mass media coverage of these incidents which often resulted in injuries or fatalities, with children, women, and other animals being common victims. A total of 364 different cases were presented as news in popular internet channel Hurriyet.[12]

Rabies and vaccination

Rabies is a viral disease that primarily affects mammals, including humans. It is usually transmitted through the bite of an infected animal, such as dogs, bats, and foxes. Rabies virus attacks the central nervous system, leading to brain inflammation and, if left untreated, death. Symptoms in humans include fever, headache, excessive salivation, muscle spasms, paralysis, and mental confusion. Rabies is almost always fatal once symptoms appear, making early treatment critical.[13,14]

99% of human Rabies cases are due to infected dogs' bites, and 4 in 10 Rabies death are in children. Rabies is killing approximately 59,000 people every year yet 100% of these deaths are preventable with dog population control programs, dog vaccinations and post exposure prophylaxis (PEP).[15]

According to the Global Alliance for Rabies Control which holds the objective of eliminating Rabies by 2030, Türkiye is a rabies endemic and high risk for travel country and has an estimated annual human rabies death count of 24, with dog vaccination coverage at around 46.70%. The total cost of rabies per year is estimated at $69,051,847 USD.[16,17] The country has not yet undertaken a comprehensive Stepwise Approach towards Rabies Elimination (SARE) assessment, indicating potential areas for improvement in Rabies control and elimination strategies.[18]

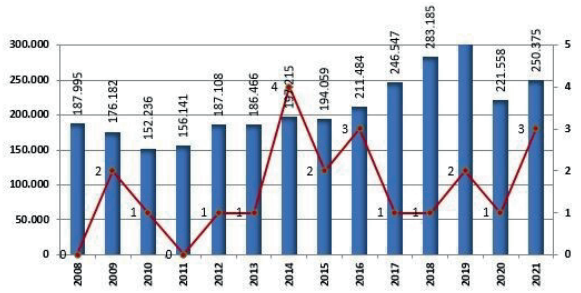

Figure 1. Number of Rabies risky contacts and Cases in Türkiye 2008-2021.[19]

The Figure 1 from the Turkish Ministry of Health's Directorate of Public Health shows an upward trend in Rabies-related incidents in Türkiye from 2015 to 2019. There was a noticeable decline in 2020 and 2021, likely due to the isolation measures during the COVID-19 pandemic. While data for 2022 and 2023 is not yet available, preliminary estimates suggest an increase in cases, inferred from media-reported incidents.[19]

Unmet Need of the Turkish Rabies Control Programme

The lack of comprehensive control and elimination efforts for Rabies risk in Türkiye, coupled with insufficient data collection, has raised public concerns. Notably, the epidemiological monitoring and assessment of Rabies risk and unowned dogs are not adequately conducted. The need for improved vaccination rates, sterilization programs and the creation of suitable and healthy living environments for stray dogs is very likely to be identified as an unmet public health need.20 To understand the extent and scope of this issue, a health needs assessment is crucial.

Proposed Aim and Objectives for HNA

Aim: The primary aim of the proposal is to conduct a comprehensive Health Needs Assessment (HNA) for the effective elimination of Rabies in Türkiye, focusing on the growing population of stray dogs.

Objectives:

- To systematically obtain gather up-to-date epidemiological data on the population, living conditions and vaccination status of stray dogs in Türkiye.
- To evaluate and analyze the collected data to define the problems, identify unmet health needs, determine the wider determinants.
- To review existing measures for the management of stray dogs and evaluate efficiency of the current approaches of Rabies Elimination.
- To propose evidence-based policies and programs aimed at effective Rabies monitoring, control, and management of stray dogs.
- To involve relevant stakeholders, including government bodies, health organizations, animal welfare groups, and communities, in the development and implementation of the Rabies elimination strategy.
- To produce a comprehensive national rabies elimination plan.

HNA Frameworks and Approaches

Cavanagh and Chadwick's 5-stage HNA framework.[21] adaptable and relevant to the proposed HNA's goals and methods. The framework is versatile, suitable for various health indicators and types of needs, making it an ideal fit for this assessment. The key stages of this framework include:

Getting Started: Establishing the foundation of the assessment (data collection), identifying the target population (stray dogs), and outlining the goals (Rabies elimination) and resources required.

Identifying Health Priorities: This involves collecting and analyzing data on stray dogs' population, health status and perceptions of their needs, to identify the key health conditions and the plight of street animals.

Assessing Health Priorities for Action: Prioritizing health conditions (Rabies) and determinants based on their impact and identifying effective interventions (vaccination, sterilization, animal sheltering).

Planning for Change: Developing actionable plans, clarifying intervention aims and forming strategies for monitoring, evaluation and risk management.[22]

Moving On/Review: This is beyond the HNA proposal.

Typically, 3 main approaches defined by Stevens & Gillam23 are important to consider in conducting an HNA:

Corporate Approach: Engaging with a broad range of national stakeholders including veterinary and public health experts, animal welfare associations, government officials and NGOs have the capacity to provide deep insights into the current Rabies situation and management strategies for stray dogs. Adopting a corporate approach is crucial for ensuring that HNA's policies and recommendations are sensitive to local circumstance and specific challenges related to Rabies and stray dogs.[24]

Comparative Approach: The approach allows for the assessment of current profile in comparison with other regions or countries. By contrasting vaccination rates, management of stray dog populations and public awareness efforts with other countries; it is easy to identify and transfer the best practices.

Epidemiological and Cost-Effectiveness Approaches: The approach is fundamental to understanding the effectiveness of the current interventions. The approach involve assessing the prevalence and incidence, evaluating the effectiveness and cost-efficiency of current measures.[25]

METHODS

Working together across sectors can create more effective solutions for complex public health challenges than any single organization could achieve alone. This collaborative approach, which involves shared decision-making and fair involvement from all partners, can lead to more impactful results[26,27]. Drawing from the Bergen Model of Collaborative Functioning, this study provides insights on how to enhance partnerships using a consortium approach. HNA involves a collaboration with a consortium of stakeholders and a panel comprising members organizations from the consortium shown in Figure 2. The panel recruited from the consortium includes a wide range of experts, such as government officials, public health professionals, representatives from health and agriculture ministries, veterinarians, animal welfare specialists, staff from the UN's country office (including WHO and FAO), international consultants, academics, sociologists, and economists.[28]

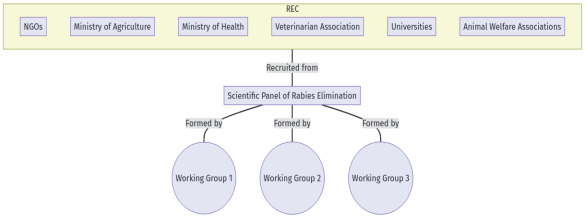

Figure 2. The structure of the Rabies Elimination HNA

The methodology is structured into 3 work packages, each allocated separate Working groups showed in the flow chart in the Figure 2.

Work Package 1: Epidemiological Data Production

This package focuses on:

- Collecting data on the population, living conditions and vaccination status of stray dogs.
- Assessing the capacity and conditions of animal shelters.
- Analyzing Rabies risky contacts and cases.
- Mapping areas with a high risk of Rabies.
- Gathering and evaluating data on dogs adopted from shelters.
- Identifying population vulnerabilities.

Work Package 2: Identify the Unmet Health Needs

This package focuses on:

- Identifying the gaps between the situation and needs.
- Projecting the future of the unmet health need if no action is taken.
- Involving stakeholders to acknowledge the plight of

the stray dogs.
- Showing the disease dynamics.[29]
- Establishing field, community, and national level surveillance systems.
- Analyzing current legislations of the management of the Street animals[30]
- Researching the human-animal conflicts.
- Carrying out expert consultations with various stakeholders to identify wider determinants (corporate approach).
- Analyze the dog ownership trends in community.

Work Package 3: Developing national strategic elimination plan

This work package focuses on:
- Forecasting vaccine requirements needed sheltering capacity and sterilization efforts.
- Supporting the case for elimination (advocacy, political will, international interest).
- Carrying out an economic impact assessment of Rabies elimination (cost effectiveness approach).
- Developing actionable plans, clarifying intervention aims.
- Planning strategic and effective targeted vaccination campaigns.
- Highlighting the impact that education and sensitization has on Rabies elimination. [31]
- Analyze and compare Rabies vaccination rates, management of stray dog populations and public awareness efforts in neighboring European countries to highlight the best practices and transfer them to the national plan (comparative approach). [32]
- Setting key indicators for monitoring Rabies elimination and dog population management efforts.
- Presenting the dog registration and identification mechanisms.

Data Collection: Data is collected through epidemiological surveys, shelter assessments, focus group consultations, with a focus on identifying vulnerable populations. Secondary data might be sourced from hospital and clinic reports, local agriculture and livestock offices and animal shelter records. Statistical (qualitative) and thematic analyses (quantitative) are adopted as a response to different needs.

National Strategic Elimination Plan: As one of the HNA process, the expected elements of the plan are:
- Analyzing the current and projected burden of Rabies to understand the scale and evolution of the disease.
- Examining dog ownership trends within communities to identify patterns that may influence Rabies transmission.[33]
- Assessing the reproductive rates of stray dogs and devising strategies to manage their population growth.
- Evaluating how access to food and shelter resources contributes to the roaming behavior of dogs and developing plans to alter these dynamics.[34]
- Outlining the risks, the stray dog population poses to communities and detailing strategies to improve animal welfare.
- Considering the impact of sterilization or contraception methods on controlling the stray dog population.
- Establishing benchmarks for ethical and humane treatment of animals across the nation.[35]
- Estimating the future needs for Rabies vaccines and the required capacity and quality of animal shelters.36
- Creating educational programs to raise public awareness about Rabies risks and prevention.[4]
- Formulating detailed action plans with specific objectives for the Rabies elimination campaign.
- Economic impact analysis.

RESOURCES

Human Resource: Human Resource Recruitment: Each work package to be coordinated by the defined members the panel with public health, veterinarian, economy, sociology and epidemiology background. Human resource includes an organized decision making mechanism in which all the stakeholders are entitled to take part.

Time: Time is a valuable resource. Since this HNA is the first ever national action and no previous data was collected, the implementation of the HNA possess some challenges such as collection of the comprehensive primary data. Detailed GANTT chart is helpful to illustrate and plan the use of time.

Funding: Funding for the implementation of the HNA encompasses a range of expenses, including personnel, data collection and analysis, stakeholder engagement, travel, equipment, technology, report production, overhead, contingency, unforeseen circumstances and capacity-building.

Challenges

Formation of consortium: Member organizations proposed for the HNA Consortium might be understaffed, lacking finding or expertise to join the HNA. To address this potential challenge there will be an open call for members to reach out to various organizations.

Data Availability and Legal Permissions: Limited, outdated data or legal permissions to conduct the HNA may pose challenges. To address this, the HNA needs to collaborate with relevant authorities to obtain the permissions.

Stakeholder Engagement: Ensuring active participation and collaboration among diverse stakeholders can be challenging. Partners therefore to play a role in all three working packages of the HNA to ensure they are included not only when they are needed but also in the planning and dissemination.35

Financial Resources: Raising adequate funds for the HNA, especially considering the current economic crisis may be challenging.

Data Collection in Diverse Regions: Türkiye's diverse and massive geography may present logistical challenges in data collection from different regions. The quality standards of the data collection is pre-determined and followed up.

Cultural and Social Sensitivity: Stray dog management and Rabies control involve sensitive cultural and social aspects. The HNA is expected acknowledge a wide range of public perspectives.

Sustainability: Ensuring the sustainability of proposed interventions and policies beyond the HNA's timeframe is crucial. The HNA focuses on creating evidence-based, feasible and sustainable recommendations.

Impacts

The unowned stray dog problem is not only crucial in terms of Rabies and other zoonotic diseases. Also, the latest media coverage has shown that there is a growing problem of roaming dog population increase and this situation has resulted in several traumatizing incidents developing public concern. HNA method addresses not one but possible a few unmet health needs which will not only propose strategies of the elimination of Rabies but also elevating animal welfare, addressing another public concern.

The impact of the HNA method is tangible with the production of national rabies elimination plan. HNA promotes evidence-based decision making, stakeholder involvement and multidisciplinary approach. HNA's findings and recommendations serve as advocacy tools to raise awareness about the importance of Rabies control and responsible stray dog management. Public support can be mobilized for implementation efforts.

Successful implementation of an HNA designed around the Bergen Model is expected to lead to improved public safety, reduced healthcare costs, enhanced economic productivity, environmental benefits, sustainable solutions, increased education and awareness, improved animal welfare, better government policies and a positive impact on public advocacy and mobilization efforts.[4]

References

1. Council of Europe. European Convention for the Protection of Pet Animals. 1987. Report No.: ETS 125. Available from: https://rm.coe.int/168007a67d
2. Kandır EE. Homeless Owners of the Streets. Ayrıntı Dergisi. 2014 Dec 5; 2(21).
3. Aydoğdu M, Meral O. Controlling the population of stray dogs and establishing a legal infrastructure. Journal of Dokuz Eylül University Faculty of Law. 2019; 21:2129–59.
4. The International Companion Animal Management Coalition (ICAM). Humane dog population management guidance. 2007.
5. Four Paws Internationaş. Stray Animals: Pets Without a Home. 2023 [cited 2024 Jan 11]. Available from: https://www.four-paws.org/campaigns-topics/topics/help-for-stray-animals/stray-animals-pets-without-a-home
6. World Health Organisation. WHO Expert Consultation on Rabies (WHO Technical Report Series, No. 1012). Geneva; 2018.
7. World Health Organization (WHO), World Organisation for Animal Health (OIE), Food and Agriculture Organization of the United Nations (FAO). Zero by 30: the global strategic plan to end human deaths from dog-mediated rabies by 2030 . Geneva; 2018.
8. TRT Haber. İstanbul'daki sahipsiz kedi-köpek sayısı açıklandı . 2017 [cited 2024 Jan 11]. Available from: https://www.trthaber.com/haber/yasam/istanbuldaki-sahipsiz-kedi-kopek-sayisi-aciklandi-311559.html
9. Demircan F. Sokaktaki köpek sayısı 2 ilin nüfusunu solladı . 2008 [cited 2024 Jan 11]. Available from: https://www.hurriyet.com.tr/yerel-haberler/ankara/sokaktaki-kopek-sayisi-2-ilin-nufusunu-solladi-9891361
10. Anadolu Ajansı. Başıboş sokak hayvanı popülasyonu giderek artıyor . 2023 [cited 2024 Jan 11]. Available from: https://www.aa.com.tr/tr/gundem/basibos-sokak-hayvani-populasyonu-giderek-artiyor/2934567
11. Erdem AK. Özlem Zengin'in "10 yılda 60 milyon sokak köpeği olacak" iddiasını hatırlatıp, başıboş köpeklerin kontrol altına alınmasını istediler. Independent Turkish. 2021 Feb [cited 2024 Jan 11]. Available from: https://www.indyturk.com/node/319846/haber
12. Hürriyet. Köpek Saldırısı Haberleri. 2024 [cited 2024 Jan 11]. Available from: https://www.hurriyet.com.tr/haberleri/kopek-saldirisi.
13. Buzgan T, Irmak H, Yilmaz GR, Torunoglu MA, Safran A. Epidemiology of human rabies in Turkey: 1992-2007. Turk J Med Sci. 2009 Jan 1; 39(4):591–7.
14. Buyuk Y, Uzun I, Aybar Y, Kurnaz G, Ozaras R. Rabies in Turkey: Three human cases illustrating the importance of suspecting exposure. Wilderness Environ Med. 2007 Sep; 18(3):214–7.
15. Rabies. World Organisation for Animal Health; [cited 2024 Jan 11]. Available from: https://www.woah.org/en/disease/rabies/#ui-id-1
16. Kilic B, Unal B, Semin S, Konakci SK. An important public health problem: rabies suspected bites and post-exposure prophylaxis in a health district in Turkey. International Journal of Infectious Diseases. 2006 May 1;10(3):248–54.
17. Koruk ST, Koruk I, Kutlu S. Where Do We Stand in the Control of Rabies? Knowledge and Practices Among Physicians in a Health District in Turkey. Wilderness Environ Med. 2011 Jun 1;22(2):151–5.
18. Turkey Rabies Elimination Progress. Global Alliance for Rabies Control [cited 2024 Jan 11]. Available from: https://rabiesalliance.org/country/turkey
19. Rabies Contact and Cases Statistics in Türkiye between 2008-2021. 2021 [cited 2024 Jan 11]. Available from: https://hsgm.saglik.gov.tr/tr/dokumanlar-zoonotik.html
20. Bradshaw J. Taxonomy of social need. In: McLachlan G, editor. Problems and progress in medical care: essays on current research. London: Oxford University Press; 1972. p. 71–82.
21. Beckingham A, Brambleby P, Chiddle R, Doyle N, Flanagan J, Glendenning R, et al. Health needs assessment: A practical guide; Health needs assessment: A practical guide.
22. Grant CG, Ramos R, Davis JL, Green BL. Community health needs assessment: A pathway to the future and a vision for leaders. Health Care Manager. 2015 Apr; 34(2):147–56.
23. Stevens A, Gillam S. Health needs assessment: Needs assessment: from theory to practice. BMJ: British Medical Journal. 1998 May 5; 316(7142):1448.
24. Gray-Burrows KA, Willis TA, Foy R, Rathfelder M, Bland P, Chin A, et al. Role of patient and public involvement in implementation research: a consensus study. BMJ Qual Saf. 2018 Oct 1; 27(10):858–64.
25. Williams R, Wright J. Health needs assessment: Epidemiological issues in health needs assessment. BMJ: British Medical Journal. 1998 May; 316(7141):1379.
26. Haugstad A. Promoting public health in Norway: A case study of NGO - public sector partnership using The Bergen Model of Collaborative Functioning. 2011 May 20.
27. McQueen, D. V. & Jones, C. M. Global perspectives on health promotion effectiveness. Global Perspectives on Health Promotion Effectiveness 1–425. Springer New York, 2007.
28. Coetzer A, Kidane AH, Bekele M, Hundera AD, Pieracci EG, Shiferaw ML, et al. The SARE tool for rabies control: Current experience in Ethiopia. Antiviral Res. 2016 Nov 1; 135:74–80.
29. Hampson K, Coudeville L, Lembo T, Sambo M, Kieffer A, Attlan M, et al. Estimating the Global Burden of Endemic Canine Rabies. PLoS Negl Trop Dis. 2015 Apr 16; 9(4):e0003709.
30. Millien MF, Pierre-Louis JB, Wallace R, Caldas E, Rwangabgoba JM, Poncelet JL, et al. Control of Dog Mediated Human Rabies in Haiti: No Time to Spare. PLoS Negl Trop Dis. 2015 Jun 25; 9(6):e0003806.
31. Coetzer A, Scott TP, Amparo AC, Jayme S, Nel LH. Formation of the Asian Rabies Control Network (ARACON): A common approach towards a global good. Antiviral Res. 2018 Sep 1;157:134–9.
32. 32. Wallace R, Etheart M, Ludder F, et al. The Health Impact of Rabies in Haiti and Recent Developments on the Path Toward Elimination, 2010–2015. Am J Trop Med Hyg. 2017;97(4_Suppl):76-83.
33. Klein A, Fahrion A, Finke S, et al. Further Evidence of Inadequate Quality in Lateral Flow Devices Commercially Offered for the Diagnosis of Rabies. Tropical Medicine and Infectious Disease 2020, Vol 5, Page 13. 2020;5(1):13.
34. Adomako BY, Baiden F, Sackey S, et al. Dog bites and rabies in the Eastern Region of Ghana in 2013-2015: A call for a one-health approach. J Trop Med. 2018.
35. Tidman R, Thumbi SM, Wallace R, et al. United Against Rabies Forum: The One Health Concept at Work. Front Public Health. 2022;10:854419.
36. Cleaveland S, Thumbi SM, Sambo M, et al. Proof of concept of mass dog vaccination for the control and elimination of canine rabies. Rev Sci Tech. 2018;37(2):559-568.