A National Strategic Plan for the elimination of dog-mediated rabies in Eritrea

THE STATE OF ERITREA

MINISTRY OF AGRICULTURE

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Disclaimer: This document was prepared using a guiding template from the United Against Rabies forum established by the tri-partite organisations (FAO, WHO and OIE). It was prepared with the assistance of Dr Johann Kotzé, appointed by the OIE and jointly sponsored by the OIE and MSD Animal Health.

Acronyms and Definitions

NSP	National Strategic Plan	A policy document setting out the intention and the methodology a country plans to use in combatting a disease.
PEP	Post-exposure prophylaxis	Vaccinations used in the prevention of rabies in an exposed person (if given early enough after the exposure).
FAT	Fluorescent antibody test	The gold standard test to confirm rabies in a tissue sample.
IDSR	Integrated disease surveillance and response	An Eritrean program to detect and respond to human diseases of high importance.
KAP	Knowledge, aptitude and practices	KAP-studies are questionnaire-based studies used to determine the knowledge and expected response of the public concerning a specific disease.
	One Health	The concept that human and animal health are inter-dependable. The successful control of rabies in humans requires interventions in animal health which in turn depends on information feedback from human health.
HORN	One Health Regional Network for the Horn of Africa	An organisation providing funding for One Health research in the Horn of Africa. The collaborating partner in Eritrea is the Hamelmalo Agricultural College.
SARE	Stepwise Approach towards Rabies Elimination	A globally recognised tool to evaluate the progress a country makes from rabies endemic (Stage 0) to free from rabies (Stage 5).
MoA	Ministry of Agriculture	
MoH	Ministry of Health	
MoI	Ministry of Information	
AED	Agricultural Extension Department	
NAPHL	National Animal and Plant Health Laboratory (NAPHL), Ministry of Agriculture, Asmara, Eritrea	
NFK	Nafka (Eritrean Nafka) EUR 1.00 = ERN Nfk 18.18 (August 2021)	
OIE	World Organisation for Animal Health	
WHO	World Health Organisation	
FAO	Food and Agriculture Organisation of the United Nations	

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1. Executive summary

Very good progress has been made in Eritrea to increase the number of dogs vaccinated against rabies. This is very encouraging as dog vaccinations form the main pillar of rabies control. The ability to logistically manage mass dog vaccination campaigns is often a limiting factor to achieve successful control and Eritrea already has a proven track record of overcoming this. Sustaining and improving on these initial successes could lead Eritrea to achieve zero human rabies cases well before the global target of 2030.

There are three main strategic objectives to support this goal:

Objective 1: Continue to build on the momentum to conduct mass dog vaccination campaigns.

Objective 2: Improve the surveillance for human and animal rabies alike.

Objective 3: Ensure adequate distribution and use of human rabies vaccine.

Surveillance for rabies is currently severely hampered by the lack of laboratory testing. There needs to be serious and urgent attention given to correct this. Not only can freedom from disease not be shown without testing, the route to achieve elimination should be guided by the information of a country-wide surveillance system. Targeted education programs based on knowledge gaps is also not currently implemented and will help to achieve Objective 2.

Although prevention of rabies in humans through the provision of human vaccine to bite victims is currently happening, there is insufficient data to evaluate the adequacy of this program.

This NSP proposes a roadmap to the elimination of rabies with a relatively small budget, providing huge returns for the investments made. It is envisaged that the required spending could decrease in subsequent years if the program is successful to achieve its objectives.

2. Introduction

Rabies is a deadly viral and zoonotic disease killing 60,000 people a year globally, of which most of these deaths occur in Africa and Asia. Rabies as a disease continues to be neglected due to numerous societal and human factors that lead to under reporting (surveillance), misinformation and poor awareness and resource limitations for its control. The deaths attributable to rabies are completely preventable through the vaccination of the main reservoir – dogs. In addition to human fatalities, rabies results in the death of livestock impacting on food security.

The main pillar of rabies control is the vaccination of dogs as it is a cheap and effective intervention. Investing in dog rabies vaccinations has the potential to eliminate the disease from a country. The elimination of diseases (as opposed to the control of disease) remains the ideal with obvious health and socio-economic benefits extending far into the future. Rabies (specifically) is a disease where all the tools for elimination exist and its elimination will contribute to achieve the United Nations *Sustainable Development Goals* (SDG 3). For these reasons, the tripartite organisations (WHO, FAO, OIE) in partnership with the *Global alliance for rabies control* (GARC) have developed a Global Strategic Plan to end human deaths by dog-mediated rabies by 2030 – Zero by 30, and have established a new *United Against Rabies* (UAR) forum to provide an enabling environment that promotes multisectoral collaboration to achieve the zero by 30 goal.

Rabies is endemic and widespread throughout Eritrea, although the incidence may vary across the different agro-ecological zones of the country, even though rabies in dogs is 100% preventable through vaccination. Dog transmitted human rabies disproportionately affects poor rural communities, particularly children. Rural communities suffer from poor awareness and a lack of access to post-exposure prophylaxis (PEP). People in rural areas, especially in pastoral and agro-pastoral communities in Africa keep many dogs, which in most cases are not vaccinated and roam freely. Over the years, regular prevention and control of rabies has largely been neglected and poorly funded at national and sub-national levels.

The Eritrea dog population is estimated at about 60,000. This represents a national dog to human ratio of 1:60. Out of the total dog population 10% of them roam freely as stray dogs in most urban and semi-urban areas. Dogs are the most common reservoirs of the rabies virus, and more than 99 percent of human cases of rabies are related to dog bites.

Currently, the incidence of dog bites is increasing significantly due to the increase in dog population and lack of dog movement control in the entire country. There are also a number of rabies cases that have not been diagnosed in some regions or zones due to lack of established surveillance systems and the absence of diagnostic facilities in different geographical locations of the country.

Rabies has been classified by the Public and Veterinary Health Services of Eritrea as one of the 3 priority zoonotic diseases. To deal with the threat and in line with the global rabies control and eradication strategy, the Government of the State of Eritrea recognizes rabies as a priority disease and is engaged in the prevention, control and ultimate elimination of rabies in Eritrea.

3. Justification for a *National Strategic Plan* (NSP)

Rabies is a well-known disease in Eritrea with a widespread distribution. In a survey conducted from 2015-2016 throughout the country, it was found that a range of domestic animals (although mostly dogs) and some humans were affected.

The dog population is estimated at 60,000 spread across the country. It is estimated that 10% are free roaming without restriction. All dogs serve as a potential source for dog-mediated human rabies and vaccinating 70% or more of the dog population can provide high confidence that the disease will disappear. It must be noted that Eritrea has a small dog population make the objective of elimination an achievable target (even before the global objectives to eliminate dog-mediated human rabies by 2030).

It is important that a comprehensive strategic plan for the prevention and control of rabies be developed to ensure implementation in all administrative areas of the country. The objective of the plan is to prevent the spread of rabies and minimize the incidence for public health reasons.

In the absence of a local vaccine-producing laboratory, it is imperative that the country ensures access to good quality vaccines for the control of the disease. The Veterinary Services of Eritrea, working with the Ministry of Health have identified rabies as a priority zoonosis to be controlled. Controlling and eliminating rabies in Eritrea would serve as a model in the Great Horn of Africa (and beyond).

This National Strategic Plan (NSP) provides the roadmap for the actions and investments that will lead to the elimination of dog-mediated rabies in Eritrea. The NSP should be reviewed every 3 years.

4. Context and current situation

4.1. Demographics

Eritrea's population reaches nearly 3.65 million people with a strong growth rate partly because of increasing life expectancies in recent years.

This is official data released by the Government of the State of Eritrea and should be taken as it is.

The livestock industry is particularly relevant to rabies as high losses of livestock can be expected as a result of the disease. Table 1 provides the livestock numbers from the 2020 census figures from the Agricultural Extension Department (AED) of the Ministry of Agriculture.

Current data from rabies registers of suspected rabies from the national laboratory in Asmara indicate higher case burdens in Anseba, Debub and the Northern Sea Region. It is currently

unclear whether there is a bias to diagnose cases closer to the laboratory. There is currently no data to indicate difference in dog ownership practices in the different regions. The current best estimate of the dog: human ratio at a country level is 1:60.

The latest estimate (2016) of the dog population in Eritrea is 60,000. No survey of the dog population has been conducted to date, but regular data is collected from regional agricultural offices to update the numbers. It is estimated that of the 60,000 dogs are found spread across the country, 10% of them roam freely without any control. The tremendous variation in landscape and population density of Eritrea makes it highly likely that the entire dog population is non-contiguous.

Species	Census number in 2020
Cattle	2 423 128
Camels	400 927
Goats	5 860 624
Sheep	2 676 430

Table 1: *Livestock population in Eritrea*

4.2. Rabies epidemiology and burden of disease

The description of the local rabies epidemiology is seriously hampered by the lack of antibody conjugate at the laboratory. This firstly means that suspect cases cannot be confirmed and secondly that a reduced number of cases will be submitted to the laboratory. Across the world, experienced diagnosticians are often surprised at some of the rabies laboratory results, making laboratory diagnosis invaluable to support clinical diagnosis.

It is well recognised that countries with very good surveillance systems seldom detect more than 10% of positive rabies cases. It is reasonable to suspect that the current state of the surveillance system in Eritrea detects less than 2% of positive cases. Although of limited value, the case register from the laboratory is shared and analysed in Tables 1 to 3.

NAPHL Reference	Date received	Village	Sub-Region	Region	Species
205/17	09/05/17	------	-------	Anseba	Canine
403/17	20/07/17	Adi Berakito	Segeneity	Debub	Equine
519/17	15/09/17	------	------	Maekel	Canine
520/17	17/09/17	Hebo	Segeneity	Debub	Canine
580/17	09/10/17	Dekseb	Serejeka	Maekel	Canine
626/17	27/10/17	Sembel	D. mierab	Maekel	Canine
653/17	13/11/17	Miela	Segeneity	Debub	Canine
010/18	19/02/18	------	-------	Debub	Canine
104/18	20/02/18	------	------	Debub	Canine
429/18	23/05/18	Mendefera	Mendefera	Debub	Canine
707/18	-------	Mai Habar	Nefasit	NRS	Canine
739/18	14/08/18	Embarek	Senafe	Debub	Canine
189/19	14/02/19	Edaga Aribi	Arbate Asmara	Maekel	Canine
399/19	06/04/19	Serejeka	Serejeka	Maekel	Canine
823/19	11/07/19	Halhale	Dubarua	Debub	Bovine
988/18	19/08/18	Durfo	Akria	Maekel	Bovine
1113/19	13/09/19	-------	-------	Maekel	Canine
1238/19	03/10/19	Maichohot	Gezamanda	Maekel	Canine
1278/19	10/10/19	Adi-Tekelezan	Adi-Tekelezan	Anseba	Canine
1454/19	21/11/19	Gadien	Dekemhare	Debub	Canine
1505/19	29/11/19	--------	--------	NRS	Canine
249/20	14/03/20	Debere Bizen	Nefasit	NRS	Bovine

Table 2: *Case register of samples submitted to the laboratory with a suspicion for rabies*

Species	2017	2018	2019	2020
Canine	6	5	6	0
Bovine	0	0	2	1
Equine	1	0	0	0

Table 3: *Distribution of submitted samples per species*

Region	2017	2018	2019	2020
Maekel	1	0	5	0
Anseba	1	0	1	0
Gash-Barka	0	0	0	0
Debub	3	4	2	0
Northern Red Sea Region	0	1	0	1
Southern Red Sea Region	0	0	0	0

Table 4: *Distribution of submitted samples per region*

Rabies is endemic and widely spread in Eritrea with some sub-zones experiencing high incidences.

There is currently no evidence to believe that a wildlife cycle for rabies exists in Eritrea but this possibility cannot be discounted completely as wildlife cases are not frequently submitted for testing. The main rabies vector species is the dog, however in 2003 a confirmed case of rabies in wildlife, a honey badger in Taraemni, Dubarwa sub-zone (Debub region) was observed. Eritrea has widespread and abundant populations of species that could play a role in urban and sylvatic (wildlife) rabies. Hyena, Jackals and honey badger are included among the wild animals that have so far been reported to be affected by rabies in Eritrea.

Since 2015 great efforts have been made to vaccinate dogs in Eritrea which almost certainly means that the countrywide coverage is above 19%. However, the lack of proper methods to quantify the dog population makes it hard to estimate the true coverage. Table 5 illustrates the tremendous effect of dog vaccinations to reduce the number of livestock lost. The methodology for the calculation is based on an established relationship between coverage and livestock incidence from global data (see Figure 1).

Vaccination coverage	Annual Incidence	Cattle lost	Small stock lost	Total value lost
0%	0.0017	3389	6639	Nfk 11,293,887
25%	0.00013	255	500	Nfk 850,050
50%	0.0000034	6.6	13	Nfk 2,187
70%	0.000000034	0.07	0.13	Nfk 225

Table 5: *Expected livestock losses at different vaccination coverages*

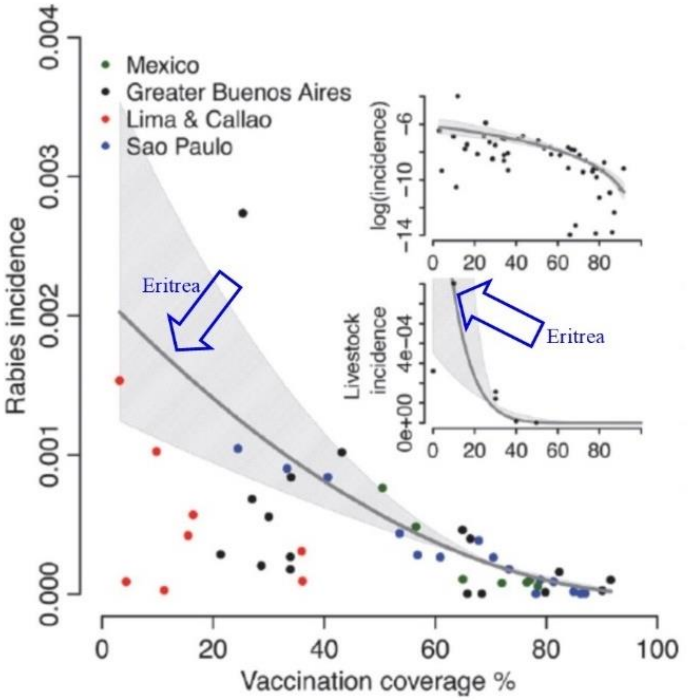

Figure 1: *The estimate of dog and livestock incidence of rabies in Eritrea (arrows point out 2015 assumption of 19% vaccination coverage).*

4.3. Current canine rabies control framework

The current rabies control efforts are mainly limited to mass dog vaccinations. Dog vaccinations should continue to remain the focus of the control efforts but there are several shortcomings that need to be addressed to get more surety of elimination. Very importantly the surveillance for rabies and knowledge about the size of dog populations need urgent attention. These two very important aspects will guide the country as it progressively moves closer to eliminating rabies.

4.4. Legal framework and legislation

Rabies is a priority disease under the National Strategic Plan of the Ministry of Agriculture (2019-2023) and Integrated Disease Surveillance and Response program of the Ministry of Health. As such it is a notifiable disease and requires immediate reporting. There are clear case definitions for both suspect and confirmed cases.

Rabies is a notifiable disease in Eritrea, regulated under the draft Animal Health Proclamation. The proclamations provide legal frameworks for prevention, control and elimination of rabies in Eritrea.

4.5. Important stakeholders

The Ministry of Agriculture (MoA), the Ministry of Health (MoH) and the Ministry of Local Government (MoLG) are responsible for the respective programs in animals and humans. The Ministry of Information is also an important stakeholder to assist with community education programs. The Forest and Wildlife Authority supports by identifying suspect cases in wildlife.

Ministry of Local Government through the Regional Administration (Zobas or Zones) contributes to provide vehicles and personnel for vaccination and mass mobilization of dog owners.

The One Health Regional Network for the Horn of Africa (HORN), in collaboration with the Hamelmalo Agricultural College can answer research questions. Particularly KAP-studies and dog population estimates.

The OIE reference laboratory in Pretoria, South Africa can provide inter-laboratory support (proficiency testing) and to shield laboratories against the risk that consumables necessary for laboratory diagnosis run out.

The OIE vaccine bank can assist to provide rabies vaccines.

There is currently no One Health platform where the information on diagnosed cases is disseminated.

4.6. Rabies surveillance

Surveillance of rabies in animals by the Ministry of Agriculture is predominantly passive, using monthly reports of dog bites submitted by zones/regions. While dog bites are not necessarily rabies cases, most cases of dog bites are not reported to the veterinary authorities leading to underestimation of the actual burden of the rabies disease in the country. Lack of effective surveillance systems and diagnostic capacity in the country has resulted in underestimation of the burden of rabies. Data aggregated by the passive surveillance system grossly underestimate the true incidence and burden of the disease in the country.

Currently, rabies surveillance is carried out by the Ministry of Agriculture (MoA), Agricultural Extension Department (AED). Suspected cases of rabies in the villages are reported to the sub-zones animal health workers who then report to the zones/regions Veterinary Officer. The latter notifies the Animal and Plant Health Division after making thorough field investigation for further action.

There is one National laboratory (NAPHL) located centrally in Asmara providing laboratory confirmation through the Direct Fluorescent Antibody test (DFA) on tissue samples. The laboratory experienced a shortage of antibody conjugate in recent years bringing laboratory diagnosis to a standstill. Very few samples have been submitted to the laboratory which further complicates an assessment of the adequacy of the surveillance system. It could be that there are logistical problems to get samples to the laboratory or a lack of knowledge to submit samples of suspect cases to the laboratory.

The laboratory currently does not have collaboration agreements with other rabies laboratories which prevents inter-laboratory proficiency testing. There is currently no local ability to sequence rabies virus and there is no sharing of samples of other laboratories to do so.

4.7. Mass dog vaccination

In the past, rabies vaccine has been a limiting factor to enable more vaccinations but two recent donations of 75 000 doses each from the OIE (European Union sponsored) have doubled the number of dogs vaccinated annually. The very successful mass dog vaccination campaigns were undertaken in 2018-2020 reporting coverage above 80%. As mentioned before, there is uncertainty regarding the coverage percentage due to a lack of trustworthy dog population estimates. However, the success of these campaigns is very significant and indicates that Eritrea has the capacity to eliminate rabies. Organising mass dog vaccination campaigns requires tremendous logistics including a trained labor force, equipment and vehicles. Considering that dog vaccinations form the main pillar of rabies control, the outlook is positive for good control of dog rabies and possible elimination. The sustained sourcing of rabies vaccines will be critical for the continued success of rabies control.

4.8. Awareness education

There is currently no clear strategy to educate neither the public nor professionals on rabies related matters. Short KAP studies are required to identify the gaps in knowledge that need to be addressed through education.

4.9. Bite case management

Members of the public are treated for dog bites at community-based health care facilities across the country. Some (but not all) of these facilities have vaccines available to administer PEP. Dog bite cases are not reportable and no data exists for the incidence of dog bite treatments at health care facilities.

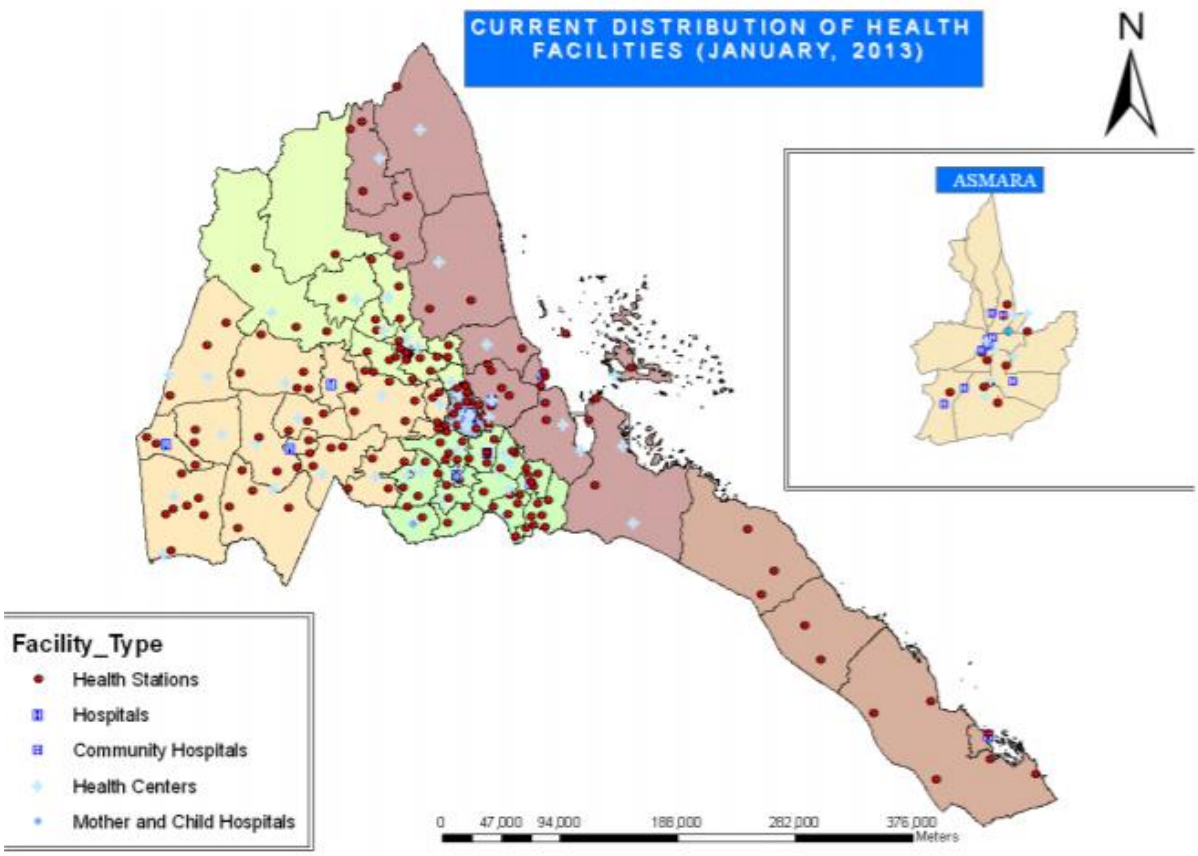

Figure 2: *Distribution of health facilities across the country*

PHARMECOR ERITREA				
Distribution Data of Rabies Vaccine Inj. Single Dose 2.5IU/0.5 of 5amps				
Zone	**Unit**	**2020**	**2021**	**Total**
		Qty	**Qty**	
Debub	Pk	384.00	80.00	464.00
Gash Barka	Pk	285.00	270.00	555.00
Maekel	Pk	478.00	295.00	773.00
NorthernRed Sea	Pk	50.00	50.00	100.00
Southern Red Sea	Pk	101.00	85.00	186.00
Anseba	Pk	0.00	50.00	50.00
Total		**1,298.00**	**830.00**	**2,128.00**

Table 6: Distribution of PEP

4.10. *Stepwise Approach towards Rabies Elimination* (SARE) assessment

A SARE assessment was completed in quarter 1 of 2021. The current assessment outcome is Stage 0 (62% completed to progress to Stage 1). In addition, 42% of the Stage 1 activities are complete. See Figure 2.

The two components that would need urgent attention to raise the SARE score are *Data Collection and analysis* and *Information, Education and Communication*. These components relate to surveillance and education activities respectively. The component that scores the best is *Prevention and Control*. This is due to the good work to conduct mass vaccination campaigns. (See Figure 3).

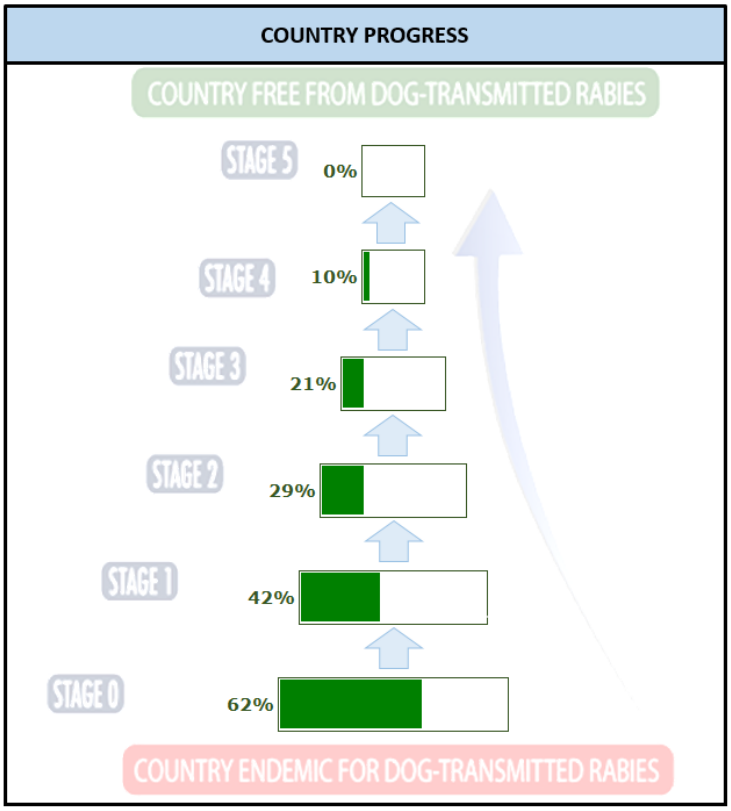

Figure 3: *Eritrea's progress through the SARE stages as of Q1 2021.*

ACTIVITY SUMMARY		
COMPONENTS	**PENDING ACTIVITIES**	**ACCOMPLISHED ACTIVITIES**
Data collection and analysis *Total number of activities = 22*	**18**	**4**
Prevention and Control *Total number of activities = 26*	**15**	**11**
Laboratory diagnosis *Total number of activities = 13*	**10**	**3**
Dog population related issues *Total number of activities = 12*	**7**	**5**
Information, Education, Communication *Total number of activities = 19*	**17**	**2**
Cross-cutting issues *Total number of activities = 11*	**8**	**3**
Legislation *Total number of activities = 12*	**4**	**8**

Figure 4: *The relative contribution of the 7 different components to the outcome of the SARE assessment.*

4.11. Regional perspectives

Rabies control in Eritrea, undoubtedly comes with a cross-border concern. High human population densities adjacent to Ethiopia (on both sides of the border) present typical conditions where cross-border spread of rabid animals can occur. Comparison of genetic sequences can assist to better inform this risk. Regardless of the exact size of this risk, there is a need for information regarding rabies control in neighbouring countries.

4.12. Gaps and challenges

Achievements	Gaps
• Clear demonstration of logistic capacity to do mass dog vaccination campaigns • Very good momentum to vaccinate more dogs • Equipped central laboratory • Burden of rabies acknowledged • Necessary stakeholders for a dog rabies elimination program identified • SARE assessment successfully conducted	• Consistent sourcing of laboratory consumables • Inadequate rabies surveillance, full extent of burden unknown • Shortage of rabies biologicals to prevent rabies in humans (RIG, vaccines) • One Health approach still absent in rabies control • Lack of national KAP studies informing an education strategy (for the public and for professionals alike)
Opportunities	**Challenges**
• Maintaining momentum of mass dog vaccinations is likely to lead to the elimination of dog mediated rabies (well before 2030)	• Consistent sourcing of vaccine and other consumables required to conduct mass dog vaccination campaigns • Cross-border concerns

There is a need to improve communication between Agriculture and Human Health to facilitate the One Health approach of combating disease. Establishing such a group will not only serve rabies control but also anitmicrobial resistance (AMR), Tuberculosis, Brucellosis and more. There needs to be both a national platform as well as a regional platform to facilitate discussion.

5. Overall goal

Reduce the number of human cases from dog-mediated rabies to zero by 2027.

6. Strategic objectives

Objective 1: Continue to build on the momentum to conduct mass dog vaccination campaigns.

Objective 2: Improve the surveillance for human and animal rabies alike.

Objective 3: Ensure adequate distribution and use of human rabies vaccine.

7. Program implementation strategy

Objective	Strategic intervention
Objective 1: Continue to build on the momentum to conduct mass dog vaccination campaigns.	• Ensure the continued supply of rabies vaccine • Obtain reliable dog population estimates
Objective 2: Improve the surveillance for human and animal rabies alike.	• Ensure the continued supply of all laboratory consumables and reagents required for rabies diagnostics. • Design and implement a strategic education strategy of the public based on KAP-study results. • Design and implement a strategic education strategy for professionals working in the field of rabies control based on KAP-study results.
Objective 3: Ensure adequate distribution and use of human rabies vaccine.	• Record the incidence of dog bites • Analyze and compare dog densities, dog bites and PEP distribution to identify gaps • Vaccinate professionals with high occupational risks for rabies (PrEP)

8. Justification for an investment in rabies

Eritrea has already demonstrated the ability to conduct mass dog vaccination campaigns across all the regions. For most countries this is a major challenge and the efforts to bring it about successfully can often take several years. This capacity puts Eritrea in the advantaged position to progress to elimination at a much faster rate than what would be expected for a country with a SARE score of 1 or less. Eritrea now has the opportunity to show the world that dog-rabies elimination can be achieved through uncomplicated means (i.e. dog vaccinations).

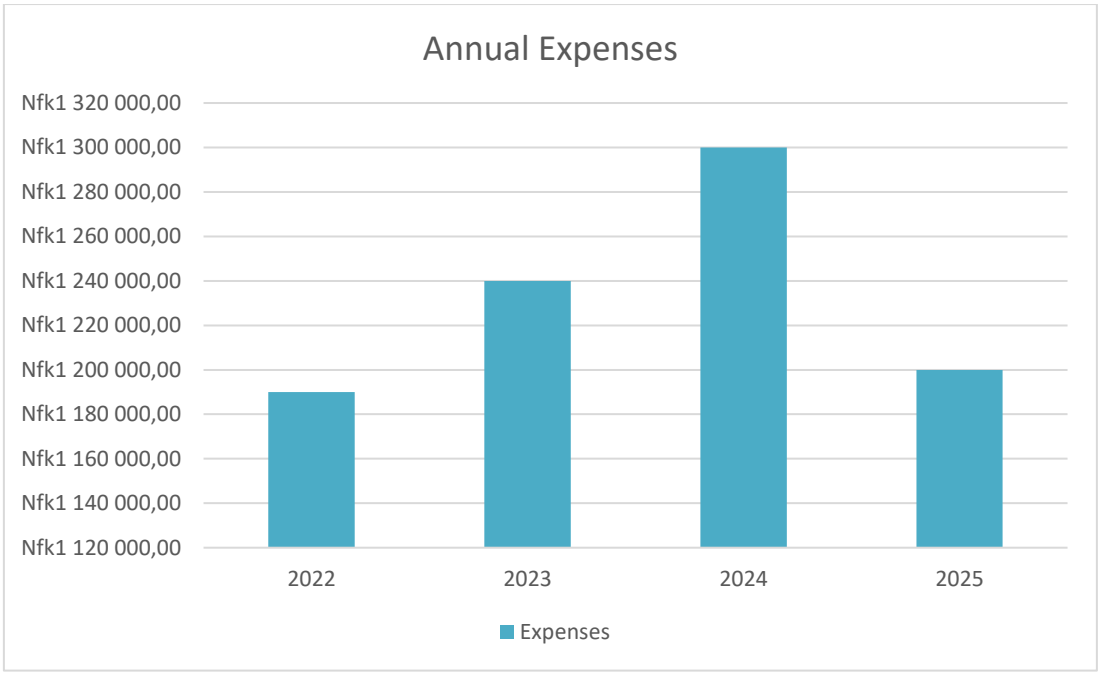

Figure 5: *Expenses required to achieve the strategic objectives*

Addendum I: Three-year Action Plan

Activity	Outcome/Purpose	Responsible authority			Years to completion	Deliverables
		Ministry of Health	Ministry of Agriculture	Ministry of Local Gov		
Strategic Objective 1: Mass dog vaccination campaigns						
Annual vaccination of dogs	Ensure adequate herd immunity	No	Yes	No	1	Dogs vaccinated
Establish reliable dog population estimates	Test methodology	No	Yes	No	1	Local dog population estimate
Outbreak investigation and response	Stop outbreaks at the source	No	Yes	No	1	Outbreaks investigated
Strategic Objective 2: Improved surveillance						
Set up a National One Health Group	Information shared	Yes	Yes	Yes	1	Minutes of first meeting and member contact details
Obtain laboratory reagents and consumables	Laboratory testing resumes	Yes	Yes	No	1	Tests conducted
Sample collection and dispatch	Samples submitted to laboratory	No	Yes	No	1	Samples submitted
Communication and reporting	Reports	Yes	Yes	No	1	Reports
Set up 7 regional One Health Groups	Information shared	Yes	Yes	Yes	2	Minutes of first meeting and member contact details
Report cases to all stakeholders	Information shared	Yes	Yes	Yes	2	Documents shared
Record and report human bite cases	Bite case registers	Yes	No	No	2	Documents shared
KAP study targeting general population	Determine awareness needs	No	Yes	Yes	2	KAP-study results
KAP study targeting professionals	Determine awareness needs	Yes	Yes	Yes	2	KAP-study results
Countrywide education drive for professionals based on KAP-study results	Surveillance improved	Yes	Yes	Yes	3	Professionals trained
Countrywide education drive for the public based on KAP-study results	Surveillance improved and lives saved	No	Yes	Yes	3	Public awareness raised
Establish relationship with OIE reference laboratory	Technique validation and assistance with sourcing	Yes	Yes	No	3	Tests validated
Strategic Objective 3: Rabies prophylaxis						
Immunize high-risk individuals	Protect high risk individuals from rabies	Yes	Yes	No	1	Proof of vaccination
Analyze dog bite registers to judge adequacy of PEP distribution	Ensure bite victims get PEP	Yes	No	No	3	Epidemiological report

Addendum II: Itemized budget

	Activity	Years to completion	2022	2023	2024
Objective 1	Annual vaccination of dogs	1	Nfk 300,000	Nfk 300,000	Nfk 300,000
	Establish reliable dog population estimates	1	Nfk 200,000	Nfk 50,000	Nfk 50, 000
	Outbreak investigation and response	1	Nfk 200,000	Nfk 200,000	Nfk 200,000
Objective 2	Set up a National One Health Group	1	Nfk 100,000	Nfk 50,000	Nfk 50,000
	Obtain laboratory reagents and consumables	1	Nfk 100,000	Nfk 100,000	Nfk 100,000
	Sample collection and dispatch	1	Nfk 100,000	Nfk 100,000	Nfk 100,000
	Communication and reporting	1	Nfk 40,000	Nfk 40,000	Nfk 40,000
	Set up 7 regional One Health Groups	2	Nfk 100,000	Nfk 50,000	Nfk 50,000
	Report cases to all stakeholders	2			
	Record and report human bite cases	2			
	KAP study targeting general population	2		Nfk 200,000	Nfk 100,000
	KAP study targeting professionals	2		Nfk 100,000	Nfk 100,000
	Countrywide education drive for professionals based on KAP-study results	3			
	Countrywide education drive for the public based on KAP-study results	3			
	Establish relationship with OIE reference laboratory	3			Nfk 100,000
Objective 3	Immunize high-risk individuals	1	Nfk 50,000	Nfk 50,000	Nfk 50,000
	Analyze dog bite registers to judge adequacy of PEP distribution	3			Nfk 60,000
		Totals:	Nfk 1,190,000	Nfk 1,240,000	NFK 1,300,000