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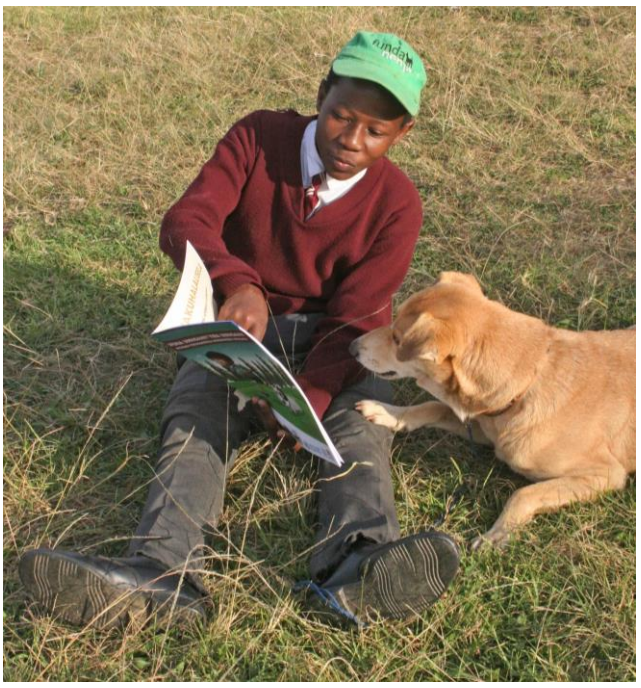
National Strategy for the Elimination of Canine Mediated Human Rabies in South Africa

(2019-2030)



September 2021

TABLE OF CONTENTS

Abbreviations

AHT	-	Animal Health Technician
CCS	-	Compulsory Community Service
CVO	-	Chief Veterinary Officer
DALRRD	-	Department of Agriculture, Land Reform & Rural Development
DEFF	-	Department of Environment, Forestry and Fisheries
DoH	-	Department of Health
ERIG	-	Equine Derived Rabies Immunoglobulin
EU	-	European Union
FAO	-	Food and Agriculture Organisation
GIS	-	Geographic Information System
HACCP	-	Hazard Analysis Critical Control Point
HEI	-	Higher Education Institute
HPCSA	-	Health Professions Council of South Africa
ID	-	Identification
LIMS	-	Laboratory Information and Management System
M&E	-	Monitoring and Evaluation
MoU	-	Memorandum of Understanding
NGO	-	Non-Governmental Organisation
NSPCA	-	National Society for the Prevention of Cruelty to Animals
OBP	-	Onderstepoort Biological Products
OIE	-	Office international des Epizooties (World Organisation for Animal Health)
ARC-OVR	-	Onderstepoort Veterinary Institute
PAHC	-	Primary Animal Health Care
PDoH	-	Provincial Department of Health
PEP	-	Post Exposure Prophylaxis
PPP	-	Private Public Partnership
PVS	-	Provincial Veterinary Services
QA	-	Quality Assurance
RAG	-	Rabies Advisory Group
RIG	-	Rabies Immunoglobulin
SA	-	South Africa
SADC	-	Southern African Development Community
SAVC	-	South African Veterinary Council

SLA	-	Service Level Agreement
SOP	-	Standard Operating Procedure
VS	-	Veterinary Services

Acknowledgements:

Past and present members of the National Rabies Advisory Group and in particular Mr Kevin le Roux for formulating the basics of the strategy and Dr Alicia Cloete for the reviewing of multiple drafts of this document.

Dr K D Perrett, Chairman, National Rabies Advisory Group, December 2019.

Executive Summary

Rabies is defined by the World Health Organisation (WHO) as a neglected zoonotic disease and has an almost 100% case fatality rate in both humans and animals.

Despite this, rabies is 100% preventable through rabies awareness education, mass dog vaccinations and the timely and correct administration of post-exposure prophylaxis (PEP) to people exposed to the rabies virus.

The elimination of canine mediated human rabies in South Africa requires a “One Health” approach – a collaborative, multi-sectoral, and trans-disciplinary approach working at local, regional and national level to achieve optimal health outcomes for people, animals and their shared environment.

Our strategy to eliminate dog-mediated human rabies by 2030 is based on the Global Framework For the Elimination of Dog Mediated Human Rabies (“Zero by 30”strategy) developed jointly by the World Health Organisation (WHO), the World Organisation for Animal health (OIE), and the Food and Agriculture Organisation of the United Nations(FAO) in Geneva in 2015.

Given adequate resources and political support, South Africa has the knowledge and practical experience to eliminate dog mediated human rabies by 2030.

Strategic Objectives

1. Create countrywide awareness and advocacy regarding rabies, its dangers, and the need for every dog to be vaccinated against rabies.
2. Foster inter-sectoral collaboration (One Health Approach)
3. Equip and empower Veterinary Services to be able to conduct mass dog vaccination campaigns in strategic areas.
4. Equip the broader veterinary related communities to assist in the fight against rabies.
5. Ensure medical personnel, especially those in the four canine rabies endemic provinces, are well informed regarding Rabies risk assessment and PEP procedures.
6. Ensure availability of good quality PEP for treating people exposed to the rabies virus.
7. Co-ordinate Rabies research efforts
8. Ongoing evaluation of progress towards “Zero by 30”

CHAPTER 1: INTRODUCTION

The WHO classifies rabies as one of several neglected zoonotic diseases and states that the term “neglected” highlights that these diseases affect mainly poor and marginalized populations in low resource settings.

Unfortunately, rabies has a case-fatality rate of almost 100% in humans and animals. In South Africa, most human cases are caused by the bite of a rabies-infected dog.

Across the world, it has been proven that the most cost effective way to eliminate dog-mediated human rabies is to control and eliminate the disease in the dog population through mass vaccination campaigns.

Rabies has been endemic in the canine population in some parts of South Africa for decades. This is despite the fact that the necessary tools and knowledge to eliminate the disease in the domestic dog population are readily available in South Africa

At a joint global meeting held in Geneva in December 2015[1], the World Health Organization (WHO), the World Organization for Animal Health (O.I.E) and the Food and Agriculture Organization of the United Nations (FAO) agreed to a framework to eliminate canine rabies with the vision of ending dog-mediated human rabies by 2030. (“Zero by 30”)

All 180 Member countries of the OIE (including South Africa) affirmed this commitment in Resolution N.26 adopted by the World Assembly of Delegates of the OIE in May 2016.

This commitment is a recognition of the importance of rabies as a human disease, not just due to loss of life, but also due to the economic impact of the disease. Post exposure treatment of humans exposed to canine rabies is far more expensive than the cost of preventing rabies in dogs.

In 2014, the Rabies Advisory Group of South Africa estimated the annual expenditure by the government on human post exposure prophylaxis to be approximately US $ 7 million (R 102 200 000)

Given adequate continued support and commitment by central and provincial government, there is no reason why South Africa should not eliminate canine mediated rabies by 2030.

1.1 Legislative and other mandates

- The Animal Diseases Regulations (R.2026 of 1986) of the Animal Diseases Act, 1984 (Act No 35 of 1984) lists Rabies as a Controlled Animal Disease. Control measures are describes in Table 2 of the Regulations and state:

Animal disease	Nature, causal organism and symptoms	Susceptible animals	Controlled veterinary act to be performed in respect of-		
			Susceptible animals	Contact animals	Infected animals
1	2	3	4	5	6
Rabies	Contagious viral disease to which man is also susceptible, mainly transmitted by the bite of an infected animal and characterised by salivation, behaviourial deviation, agressiveness, progressive paralysis, high mortality and continious bellowing in cattle	All mammals	All dogs and cats in the Republic shall be immunised with an efficient remedy by an officer, veterinarian or authorised person at the age of three months followed by a second vaccination within 12 months, at least 30 days after the first vaccination and thereafter every three years. Dogs and cats younger than three months may be vaccinated provided that they are again vaccinated at the age of three months, followed by a third vaccination within 12 months and thereafter every three years	Contact animals shall be isolated and immunised with an efficient remedy by or under the supervision of a veterinarian, an officer or authorised person, unless the State Veterinarian decides to destroy the animals.	Infected animals shall be isolated and be destroyed by the responsible person or an officer, veterinarian or authorised person: Provided that a responsible person who kills such animal shall retain the carcase for the attention of an officer, authorised person or veterinarian.

- Resolution N.26 adopted by the World Assembly of Delegates of the OIE in May 2016.
- Veterinary and Para-veterinary Professions Act (Act 19 of 1982)
- Animal Protection Act, 1962 (Act 71 of 1962)
- Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act 36 of 1947)
- The National Health Act (Act 61 of 2003)
- Communicable Diseases Regulations
- International Health Regulations (2005)

CHAPTER 2 VISION AND PURPOSE

2.1 Vision

Zero human deaths from dog-mediated rabies by 2030

2.2 Purpose of the National Strategy for the Elimination of Canine Mediated Human Rabies in South Africa

The purpose of this national strategy is to ensure that the National and Provincial Veterinary Services (VS), the National and Provincial Departments of Health (DoH) and other stakeholders, including relevant industries and organizations, have a common vision and understanding of the canine rabies situation in South Africa, and develop a commitment to work together cohesively to achieve the vision of zero human deaths from dog mediated rabies by 2030.

2.3 Values

In conjunction with the vision driving this strategy, the National Strategy for the Elimination of Canine Mediated Human Rabies in South Africa will subscribe to the following values:

- Professionalism
- Responsiveness
- Inclusiveness
- Transparency
- Objectivity

CHAPTER 3: SITUATIONAL ANALYSIS

3.1 Historical perspective and background to Rabies in South Africa

Although the first confirmed case of rabies in South Africa occurred in an imported dog in the Eastern Cape in 1893, the current occurrence and distribution of canine rabies in the country is mainly as a consequence of two incursions:

3.1.1 In the early 1940's the disease moved south of the Zambezi River and reached the northern Limpopo Province of South Africa in 1950 and

3.1.2 The disease was re-introduced into KwaZulu-Natal by an influx of refugees from Mozambique in 1976. (The first introduction from Mozambique in 1961 was contained and eliminated)

This last outbreak event in 1976 was not brought under control and the disease spread down the coast, reaching East London by the early 1990s.

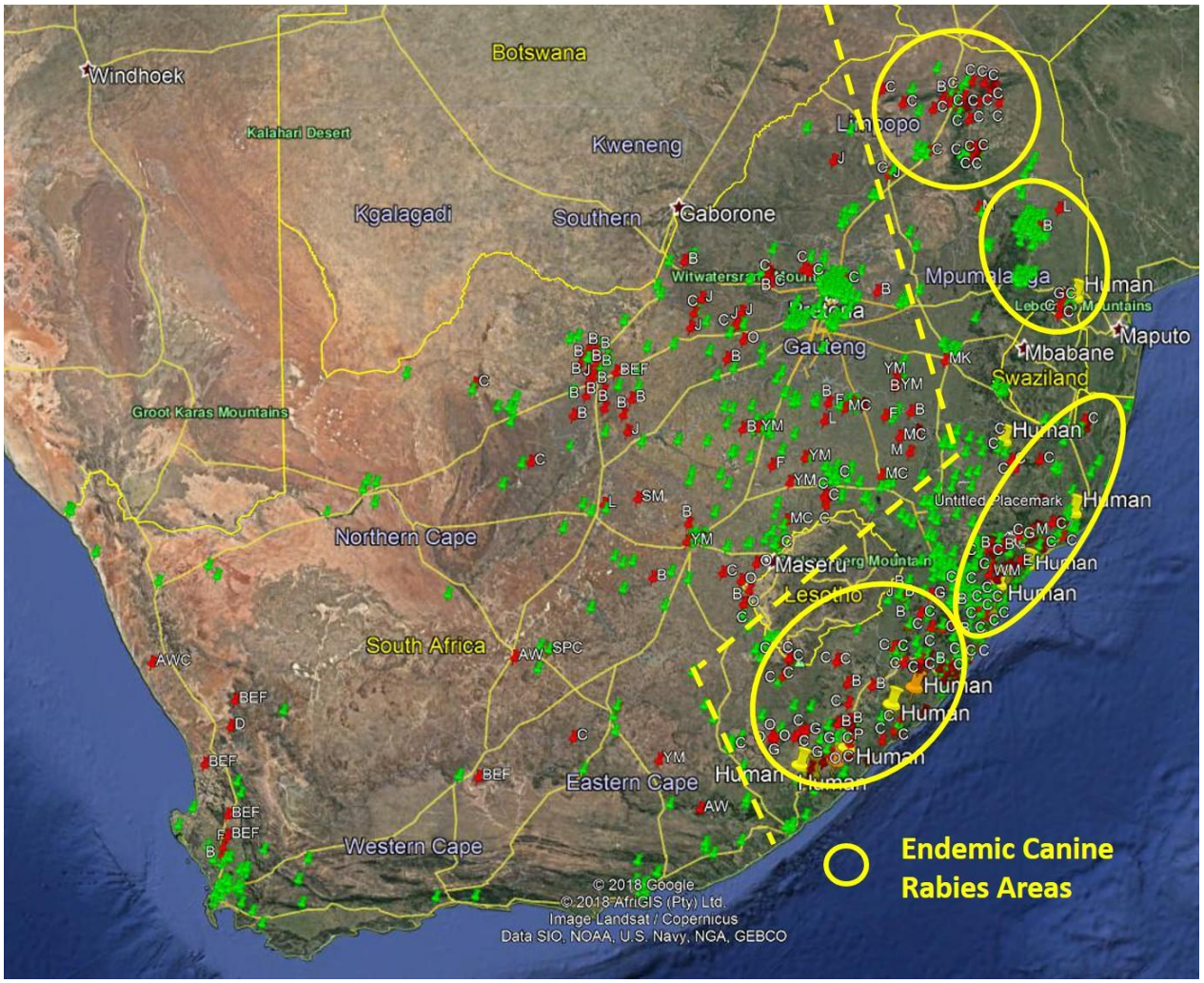
3.2 Current situation:

Canine rabies is often perceived as a countrywide problem and consequently that a successful strategy must achieve the vaccination of at least 70% of all dogs in South Africa. This however is untrue (and often scares decision makers into doing nothing) and a strategic response is required.

Canine rabies is found predominantly in four areas in the eastern part of the country as shown in Map 1 (based on laboratory submissions of rabies cases).

If these four areas were correctly and strategically vaccinated, it would eliminate more than 90% of dog rabies in South Africa and would in all likelihood, along with sound post exposure treatment systems, achieve the goal of zero human deaths.

In addition, there is an emerging canine cycle on the Free State – Lesotho border which will require a sustained and co-ordinated control effort on both sides of the border in order to keep Free State free of canine rabies.



Map 1. Endemic Canine Rabies Areas in RSA

The four main focal source areas of canine rabies in SA: Limpopo; Mpumalanga; KZN and Eastern Cape. (Other areas to the west of the yellow dotted line are wildlife rabies)

3.3 A One Health Approach

The One Health concept recognizes that the health of people is connected to the health of animals and the environment. It proposes a collaborative, multi-sectoral, and trans-disciplinary approach working at local, regional, national, and even global levels to achieve optimal health outcomes for people, animals and their shared environment[2].

A One Health approach to Rabies is a necessity because the protection of humans from rabies is most effectively achieved by addressing the source of the disease. This in turn is best achieved by eliminating the disease in domestic dogs using targeted mass

vaccinations. This is primarily the responsibility of the Veterinary Services. However, until the elimination of canine rabies is achieved, human rabies has to be prevented through the efficient delivery of post exposure prophylaxis to potentially exposed individuals. This is primarily the responsibility of the DoH with the DEFF playing a supportive role.

This perfectly fits the WHO concept of addressing the occurrence of neglected zoonotic diseases, i.e. preventing and mitigating their occurrence in humans requires control and, where feasible, elimination of the disease in their animal reservoirs.

Education and awareness are key elements in this successful system. Any countrywide campaign to control the disease while creating awareness can result in a dramatic increase in the demand for PEP treatment in humans, which could carry significant costs to provinces. After elimination, the cost-benefits ratio will improve as the disease risk decreases.

Although the SVS and DOH are perhaps the major players in this strategy, numerous other parties will continue to play important, even vital, roles in the overall effort to eliminate human deaths from canine mediated rabies. These range from other government departments such as the DEFF, numerous NGOs, university researchers, volunteers, etc. These relationships need to be nurtured and expanded so that a broad spectrum of society have a similar vision, and collective resources and knowledge from each can contribute to elimination.

CHAPTER 4: CONSTRAINTS AND CHALLENGES

Although a number of constraints and challenges are identified separately and highlighted below, they are in fact all interlinked, and thus addressing one of the challenges is unlikely to benefit the situation as a whole if the others are not also addressed.

4.1 National vs Provincial vs Municipal Structures

There are nine different Provincial Veterinary Services together with the national veterinary services and nine different Provincial Departments of Health together with the National Department of Health in South Africa. Both health and veterinary services are provincialized based on the Constitution of South Africa Each one has their own independent budget, leadership and priorities.

Furthermore, some of the traditional functions of both the PVS's and PDOH's have been further devolved to municipal level, although this varies from province to province.

This fractured nature of the country's Veterinary and Health Services structures and the consequent lack of a direct chain of command from the national offices (DALRRD and DOH) to staff in the field makes co-operation and coordinating efforts across provincial boundaries and between the two departments unnecessarily problematic, and often virtually impossible.

The South African Veterinary Strategy (2016 – 2026) recognizes this and has, as part of one of its Strategic Objectives, set the goal of restoring the national chain of command for all aspects of veterinary services.

4.2 Lack of political support for eliminating canine rabies

Given that the necessary tools and knowledge to eliminate the disease in the domestic dog population have been readily available in South Africa for years, the lack of progress in eliminating the disease can be attributed to a break in the chain of command and a lack of political will and commitment to get the job done.

This lack of political will is reflected in the following two major obstacles:

- failure to address the functional and structural challenges faced as a result of a provincialized system for Veterinary Services (based on the Constitution)

- failure to provide adequate budgets for rabies elimination at local, regional and national levels

Each of these two main factors gives rise to a cascade of related and interconnected issues that negatively impact on our ability to overcome this disease.

While rabies has to compete with a whole range of other diseases that affect humans in South Africa e.g. Tuberculosis, HIV, etc., it should be noted that the cost of eliminating canine mediated rabies is miniscule when compared to the amount of money being spent on these other diseases.

4.3 Lack of awareness of the disease in both the public domain and professional health care systems

Given the modern media's propensity for sensationalism and the seemingly collective short memory of the public body, keeping Rabies awareness high in the public domain is an ongoing battle.

Awareness amongst the public typically peaks after a human fatality is reported in the press but quickly dissipates as other news headlines distract attention away from rabies.

In the human health care system, rabies is rarely at the top of any Differential Diagnosis list unless the individual health practitioner has encountered rabies before. Post exposure prophylaxis is thus often not given at all or is given incorrectly (including when it is not required!).

This paradoxical situation results in an inordinate amount of taxpayers money being wasted administering PEP to patients when it is not required, while people continue to die from rabies because they do not receive PEP.

4.4 Lack of veterinary experience and knowledge of how to implement and sustain a rabies control plan

The South African Veterinary Strategy (2016 – 2026) states the following: "Prior to 1990, South Africa was amongst the leading nations in veterinary research and diagnostics worldwide. The Onderstepoort Veterinary Institute (ARC-OVR) is accredited by the OIE as a reference diagnostic centre for a number of animal disease causing agents. This status is at risk of being lost because the diagnostic and research capacity has been steadily

declining."

The same can be said for our ability to implement and sustain a rabies control plan across multiple geographic regions and role players. A lot of institutional knowledge has been lost over the past two decades when it comes to effectively operating in the field. However, some of this required expertise does still exist but is currently not being harnessed and utilized to best effect.

In many ways, this is a direct result of the problems associated with the lack of a chain of command from DALRRD to Veterinary Services in the provinces as highlighted in 4.1.

4.5 Poor animal rabies surveillance

Two excellent laboratories exist in South Africa, one in KwaZulu-Natal and the other in Gauteng. While the quality of the diagnostics is not questioned, geographical access to diagnostics is a major challenge. There is a direct correlation between distance to the laboratory and quality of surveillance[2] with areas located closer to laboratories showing much better surveillance.

This is a major consideration in the call for improving rabies diagnostics in the areas where the disease is most prevalent, as well as equipping laboratories in more remote areas to receive and correctly package samples for sending to rabies diagnostic laboratories.

Surveillance and awareness go hand in hand and increased awareness leads to increased surveillance (more samples submitted).

4.6 Lack of human and logistical resources to implement and sustain control activities

In order to successfully eliminate dog mediated rabies in humans from any given area, sustained and targeted mass dog vaccination campaigns need to be undertaken.

These types of campaigns require a long-term and ongoing commitment by government to fund and support the necessary human and logistical requirements needed to carry out these campaigns well beyond the apparent disappearance of the disease[2,3].

4.7 Poor post exposure prophylaxis for humans in many areas

This is a problem in many of the endemic rabies areas of South Africa and may be a result of:

(a) Due to poor surveillance and apparent absence of the disease (and therefore lack of public awareness), human treatment is not prioritised or even sought for dog bites (example: In Limpopo more than 25 patients died before the disease was recognised as rabies due to a lack of awareness of the disease)

(b) Poor infrastructure leading to an inability to supply the required vaccine and Human Rabies Immunoglobulin (RIG) or the inability to maintain a suitable cold chain (either in the supply chain or at storage facilities at treatment centres).

(c) Manufacturing problems in RSA leading to a shortage of RIG. The replacement Equine Derived Rabies Immunoglobulin (ERIG) is restricted to only being used in medical facilities with resuscitation capabilities (due to the possibility of anaphylactic reactions in patients administered ERIG).

(d) Failure of health facility personnel to conduct a proper risk assessment of the presenting patient and failure to correctly administering PEP (also see 4.8 & 4.9)

4.8 High Turnover of Health Professionals

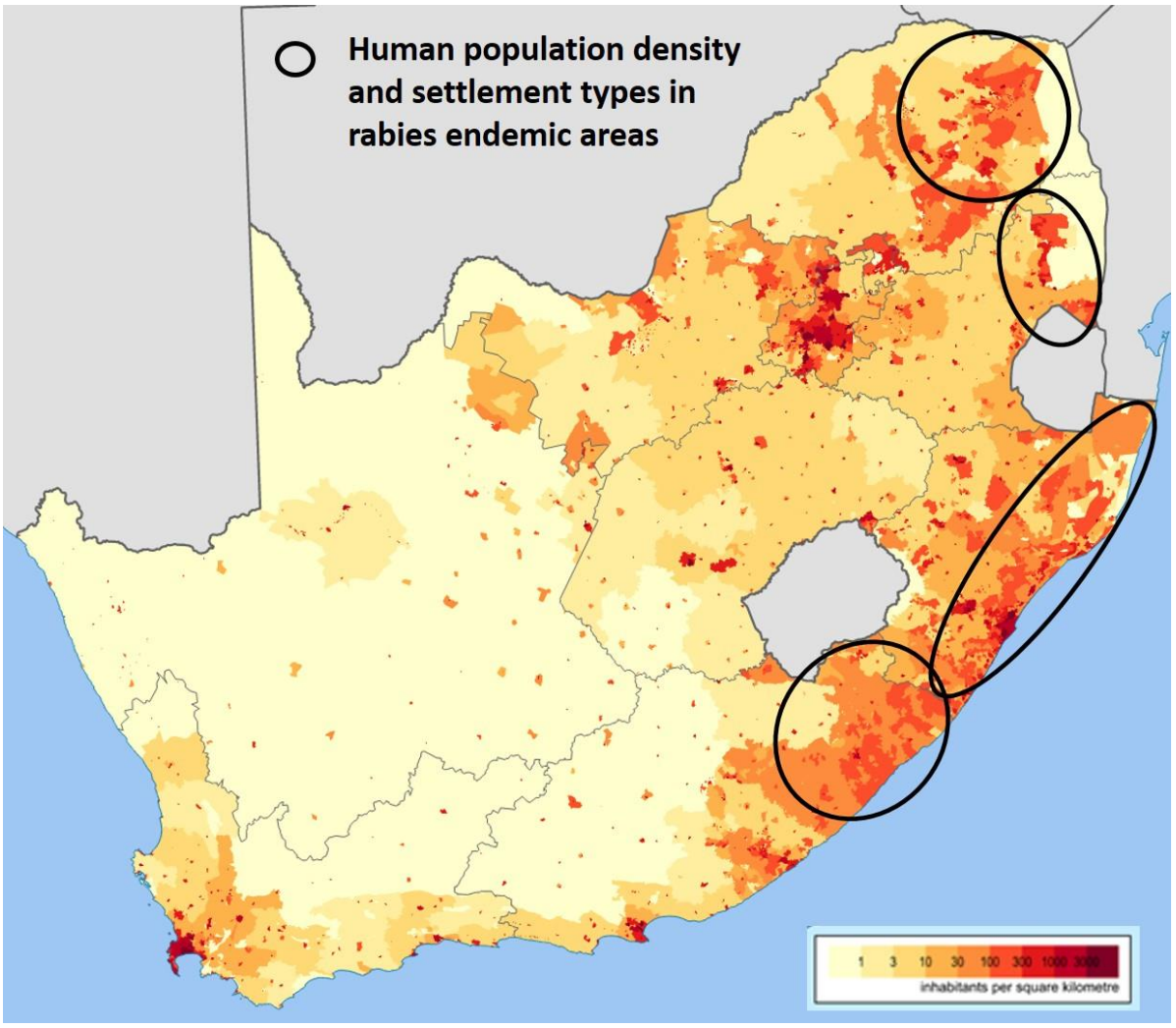
The high turnover of health professionals in poor rural areas means that many of these people are not exposed to any rabies awareness training because: (a) they are not in one place long enough to receive training, or (b) if they do receive training, they move away and that knowledge is lost to the facility where they were working.

4.9 Geographical locations of disease hot spots

The 4 main areas in which canine rabies occurs (see map below) are areas that feature predominantly rural communities and dense semi-formal urban areas where poverty levels are high and people seek work outside the areas.

Furthermore, service delivery is poor in all these areas and there are severe infrastructural inadequacies.

Generally, these areas also feature high dog populations with limited access to animal welfare or primary health care veterinary services. These areas lack dog population management and little or no restrictions are placed on dog movements through the implementation of (existing) regulations.



Map 2. Human population densities in rabies endemic areas

4.10 Canine rabies vaccine selection, procurement and availability

While all canine rabies vaccines registered for use in South Africa meet the minimum standards prescribed for registration, this does not mean that all of them are suitable for use in the various field situations that rabies vaccinators encounter[4].

In addition, the cost of the vaccine represents a very small percentage[5] of the total cost of vaccinating an animal. Thus, the selection of a rabies vaccine should not be based

on cost alone, but rather on its suitability to be effective in the field, as a lot of money is spent on accessing dog populations for vaccination.

These “in field factors” include vaccine heat tolerance, age at which the vaccine can be given to an animal, and the range of species the vaccine can cover and the respective dosages. All these factors affect the efficiency and effectiveness of mass vaccination campaigns.

Government procurement systems are slow and cumbersome and vary greatly between provinces. In an outbreak situation, large quantities of rabies vaccine need to be immediately available in the affected area in order to mount an effective response

A national rabies vaccine bank would ensure that rabies vaccine was always available to meet the immediate requirements needed to tackle an outbreak in any province. Constant replenishment is essential to ensure that an emergency stockpile of vaccine remains available.

CHAPTER 5: INTERVENTIONS REQUIRED AND RECOMMENDATIONS

While a One Health approach to the elimination of dog-mediated human rabies makes sense, some actions and responsibilities remain the mandate of a specific group within the One Health spectrum.

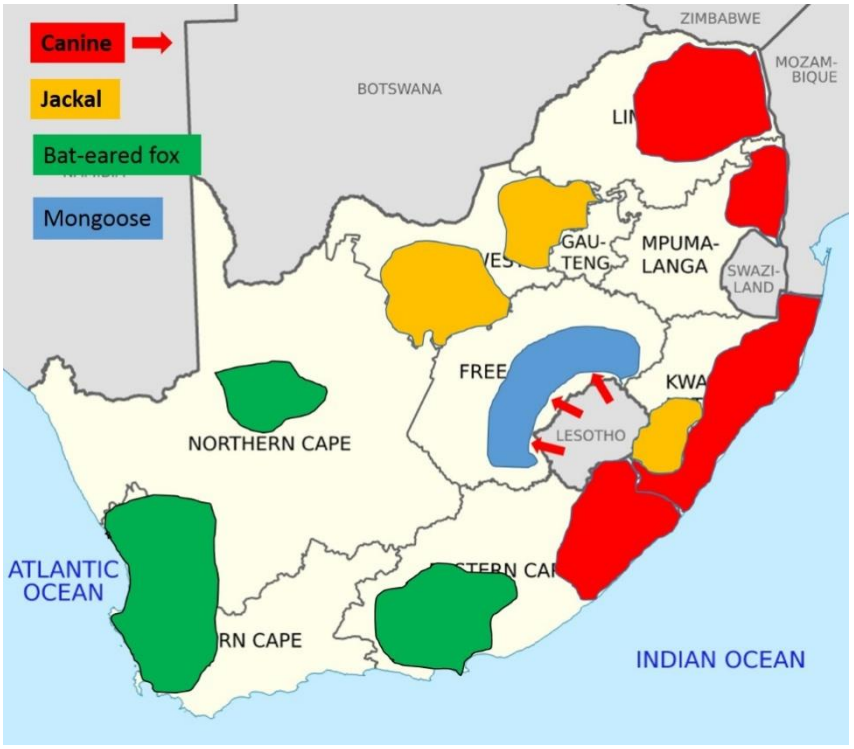
These are outlined below in 5.1 – the proposed Veterinary control strategy for dog rabies, which will be driven by the Veterinary authorities and 5.3 – the proposed Public Health Approach for the Prevention of Human Rabies, which will be driven by the DoH.

The One health approach however demands that these two aspects of the overall strategy do not take place independently of each other, but are as inclusive of as broad a coalition of interested and capable parties as is practical and effective.

5.1 Proposed Veterinary Control Strategy

The rabies control strategy for dogs is divided into two parts – one for the canine rabies endemic provinces (the critical areas i.e. Eastern Cape, Kwazulu-Natal, Mpumalanga and Limpopo Provinces) and one for the other provinces which experience mainly Wildlife

rabies (Western Cape, Northern Cape, Gauteng, North West and Free State Provinces) as depicted below.



Map 3. Overview of main animal host species geographically in SA based on the characteristics of the outbreaks and species distribution.

5.1.1 Proposed Control Strategy for the canine rabies endemic provinces

Overview:

Eliminating canine rabies from an area has been shown to be possible in many settings all over the world. It hinges on the use of and availability of good quality dog vaccines and being able to mass vaccinate an adequate percentage of the dog population until the area can be declared free[7]. However as is the case in any elimination strategy it is the critical factors surrounding the implementation of these control measures that are the real obstacle to success[3].

South Africa is in a unique position to be able to lead the way in Africa in rabies control. Proof of concept interventions have successfully reduced canine rabies and removed human deaths in KwaZulu-Natal and Mpumalanga Provinces. Therefore, the foundation of

knowledge already exists in the country to adequately control canine rabies to prevent human cases:

a. Target key focal areas for mass canine vaccination campaigns

Vaccination of 70 % of the entire dog population of South Africa is neither feasible nor sustainable. However, as outlined in this document, this is unlikely to be necessary to eliminate canine mediated human rabies in South Africa

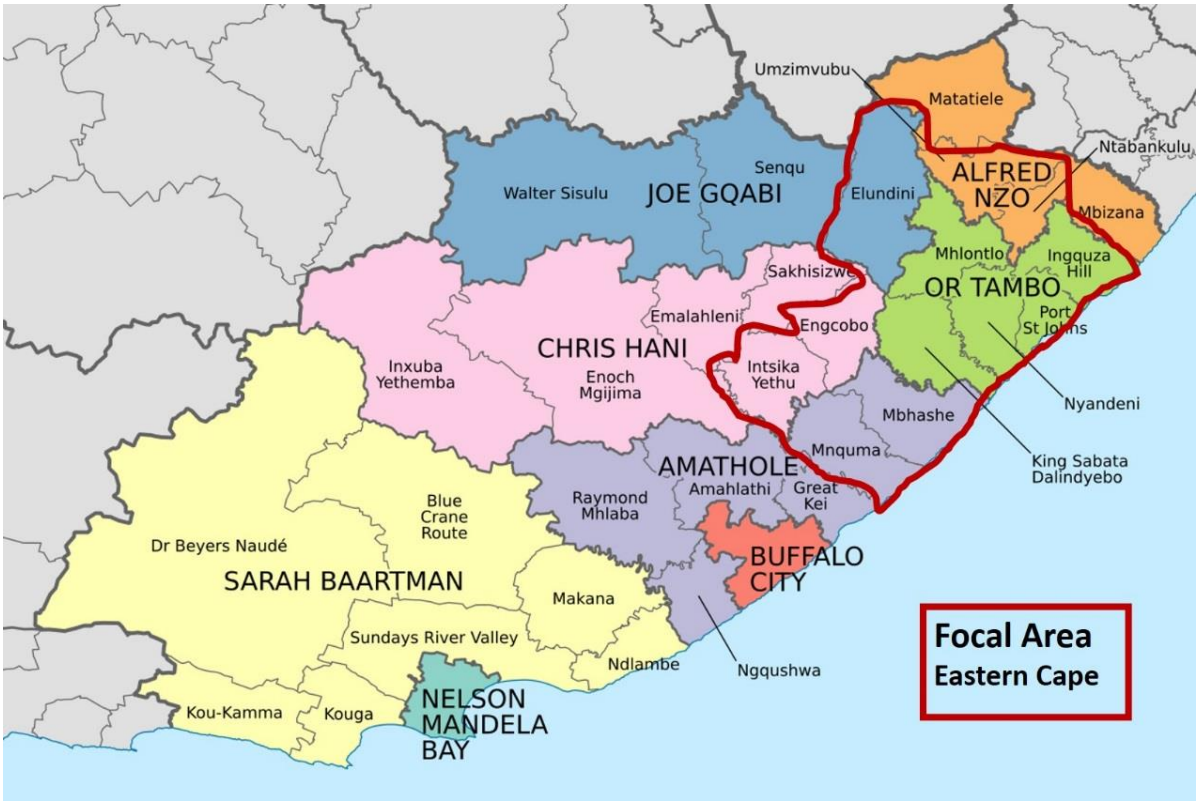
Below (Table 1 and Maps 3-6) are the key focal areas of South Africa's canine rabies cycle, which represents a fraction of the country's total dog population. Furthermore, if careful evaluation and planning is undertaken, it is possible that subpopulations within these areas could be targeted as source areas, instead of the whole area having to be vaccinated.

If these targeted areas were properly vaccinated, most of South Africa's canine rabies could be eliminated, as this kind of approach will have a significant knock-on effect in neighbouring areas.

Table 1: key focal areas of South Africa's canine rabies cycle

Province	Districts – Municipalities (See Maps below)	Human Population	Dog Pop	Target
Eastern Cape	OR Tambo – All 7 municipalities	1364943	189575	132702
	Alfred Nzo – Umzimvubu munic.	191620	26613	18629
	Amatole – Mbashe and Mnguma	507299	70458	49320
	Chris Hani – Intsika Yetu and Engcobo	300885	41789	29252
	Joe Gqabi - Elundini	138141	19186	13430
Total		**2502888**	**347621**	**243333**
KZN	Ethekweni – (Only portions required ratios taken from survey)	3442361	163921	114744

	Illembe- 4 municipalities	606809	84279	58995
	King Cetshwayo – 4 municipalities	752367	104495	73146
	Zululand – Ulundi and Nongoma	383225	53225	37257
	Ugu – Ray Nkonyeni and Umdoni	387550	53826	37678
Total		**5572312**	**459746**	**321820**
Mpumalanga	Enhlanzeni - Bushbuck ridge	546215	75863	53104
	Enhlanzeni - Mbombela	695913	96654	67658
	Enhlanzeni - Nkomazi	410907	57070	39949
Total		**1653035**	**229587**	**160711**
Limpopo	Vhembe- 4 municipalities	1294722	179822	125875
	Mopani- 5 municipalities	1092507	151737	106215
	Capricorn – Lepele/Molemole/Pol	967670	134398	94079
Total		**3354899**	**465957**	**326169**
Grand Total		**13 083 134**	**1 502911**	**1 052 033**


Umzimvubu
Matatiele
Ntabankulu
Walter Sisulu
JOE GQABI
Senqu
Elundini
ALFRED NZO
Mbizana
Mhlontlo
Ingquza Hill
Sakhisizwe
OR TAMBO
Port St Johns
Emalahleni
Engcobo
CHRIS HANI
Inxuba Yethemba
Enoch Mgijima
Intsika Yethu
Nyandeni
Mbhashe
Mnquma
King Sabata Dalindyebo
AMATHOLE
Amahlathi
Great Kei
Raymond Mhlaba
Blue Crane Route
Dr Beyers Naudé
BUFFALO CITY
SARAH BAARTMAN
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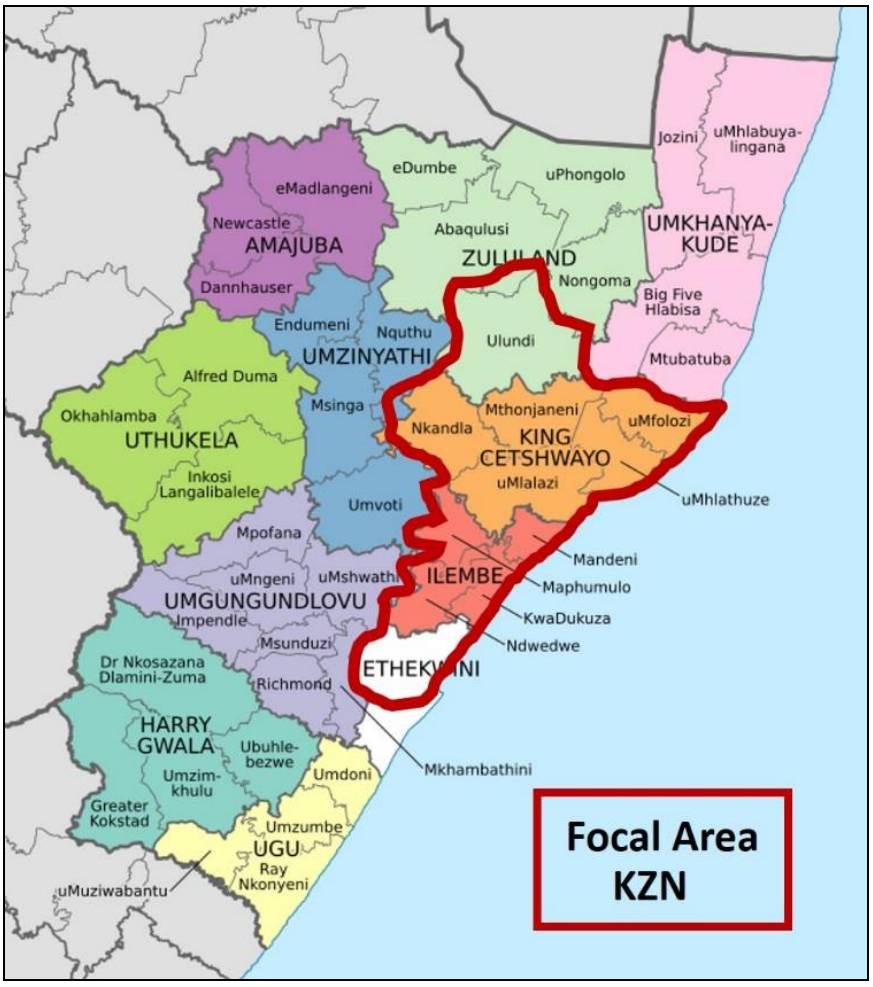
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UMKHANYAKUDE
Dannhauser
Nongoma
Big Five Hlabisa
Endumeni
Nquthu
UMZINYATHI
Ulundi
Mtubatuba
Alfred Duma
Msinga
Okhahlamba
UTHUKELA
Mthonjaneni
Nkandla
uMfolozi
KING CETSHWAYO
Inkosi Langalibalele
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uMhlathuze
Umvoti
Mpofana
Mandeni
uMngeni
uMshwathi
ILEMBE
Maphumulo
UMGUNGUNDLOVU
Impendle
KwaDukuza
Msunduzi
Ndwedwe
Dr Nkosazana Dlamini-Zuma
Richmond
ETHEKWINI
HARRY GWALA
Ubuhlebezwe
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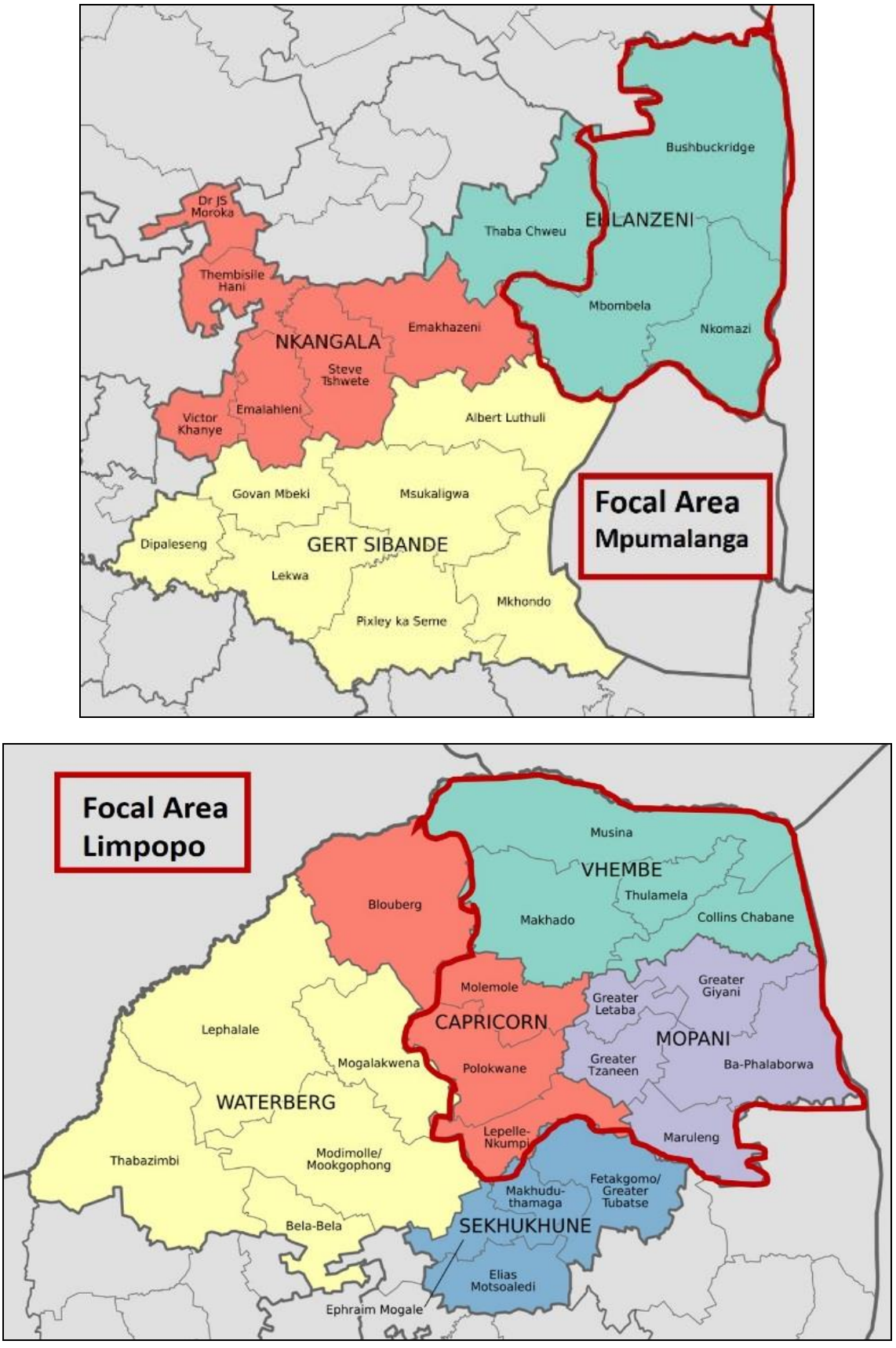

Maps 3-6. Focal municipalities of four key provinces.

b. Further observations regarding these areas and targeting specific focal areas

i. The Eastern Cape, Limpopo and Mpumalanga Provinces have unique and very advantageous community structures, with most areas having defined villages.

ii. This has the following advantages:

   i. Allows for compartmentalizing the areas of importance and selecting key vaccination barriers and buffer zones.

   ii. Villages are easier to work in with better community participation and movement to central points.

   iii. Better use of local authorities, traditional and civil society organisations to mobilize people.

   iv. Easier planning (suggested strategic vaccination plan to be drawn up for each province).

   v. Easier to improve the provision of PEP biologicals to these focus areas as well as improve dog bite surveillance, notification of human cases and sample submissions to NICD, due to well-structured health care services in the communities?

   vi. Easier to Focus on Education and Awareness. Awareness in the communities should include:

      1. Rabies Action Groups need to be actively operating in each province and focus area.
      2. Set up real time reporting system to disseminate rabies case information across sectors (Veterinary and Health Services) and down to community health level.
      3. Utilization of all available resources (both Health and Veterinary authorities) for the dissemination of information (CCG's, animal welfare, schools, etc.)

   vii. Easier to train smaller groups of people in communities.

   viii. Easier to establish and maintain local partnerships:
   E.g., Expansion of the Rabies Day initiative where the SAVC was approached to ask all private veterinarians to vaccinate pets against rabies (either free or at cost) for the month of September.

j. (KwaZulu-Natal Province lacks these formal village structures and is more difficult to approach and facilitate. However, a system has been developed that will work if supported by the correct management and logistics.)

c. Further Considerations

i. Training of local vaccinators - This can be authorized (operates in KZN), and needs to be supervised by the local State Veterinarian. This greatly assists in increasing effective manpower.
   1. Utilize local vaccinators for a short period in the focal areas to assist campaigns and continue mop-up vaccinations after campaigns have finished.
   2. Livestock associations need to help identify people to be trained and deployed for vaccination

ii. Sequence every rabies positive animal case to better understand the epidemiology of canine rabies in the endemic areas.

5.1.2 Proposed Control Strategy for non-critical provinces

a. Identification of potential points of entry of canine rabies into province. (e.g. Western Cape border with Eastern Cape Province and the Free State Province's Lesotho border)
b. Vaccinate buffer zones along these key borders and in areas of frequent migration from source areas.
c. Also vaccinate key areas where there is frequent contact with wildlife cycles
d. Education/Education/Education = Will lead to improved surveillance.
e. This should be funded by these provinces and should remain within their capacity.

5.2 Requirements to undertake the proposed strategy

5.2.1 Staffing:

Adequate human resources are essential for successful and sustained campaigns. It is often true that AHT's are not uniformly distributed and key rural areas have less staff, as posts are difficult to fill due to the reluctance of many young people to work away from the cities. This is true for Veterinary and Health Services.

Veterinary Services staff can be moved within provinces to assist in major vaccination and awareness campaigns, however this is a very costly undertaking (transport, accommodation, etc.) and other options need to be explored. E.g. KZN intends to re-employ dip tanks assistants from local communities who can be trained to vaccinate animals around their dip tank area.

The larger human resources of the health department need to be called on to assist with disease awareness (e.g. Community Care Givers).

Other organizations:

i. Animal welfare organizations can play a significant role in surveillance and so these relationships should be strengthened.
ii. Animal welfare groups can also be authorised and trained to vaccinate and can play an important role in boosting vaccine numbers in key areas (under State Veterinary supervision).

5.2.2 Rabies Vaccine:

To get the maximum result for the effort and expense of running vaccination campaigns, particularly in the rabies endemic areas, the vaccine used should meet the following requirements:

- Be thermo-stabile (supported by published research), safeguarding against a potential break in the cold chain especially in rural areas (the development of a thermo-stable vaccine was the key to the success of the Rinderpest eradication program[3]).
- Have antigen levels of above 1 IU per ml of vaccine
- Be registered for use in dogs, cats, cattle, sheep, goats, equines & wild carnivores to ensure coverage of multiple species as required
- Require the same dose (1ml) for all registered species
- Be registered for use in animals less than 3 months' old
- Be safe for use in pregnant bitches

These requirements have now been added to the Transversal Contract RT-10 specifications of National Treasury.

5.2.3 Rabies Vaccine Bank

A vaccine bank[6] should be established and maintained to ensure a continuous flow of rabies vaccine during outbreaks and to alleviate the effect of procurement breakdowns, which appear to be common across the rabies endemic provinces. Ideally, the vaccine stock should only be utilised in emergencies and when procurement systems hamper timeframes. Stock used under these circumstances by Provinces should be replaced a.s.a.p. to ensure that a continuous emergency stockpile is available.

It is also suggested that assistance be offered to neighboring countries for border vaccinations on high-risk borders. This was approved at national level in 2016 but has not yet become a reality.

5.2.4 Vehicles:

NB The availability of suitable vehicles at all times is a key element in controlling rabies successfully in our focus areas! Additional vehicles would help improve all aspects of animal disease control by Veterinary Services (not just rabies) and should be seen as a worthwhile investment.

An informal survey conducted by NATRAG in 2017 indicated that in most provinces, less than 50% of staff have vehicles that are assigned solely for their use. While a full complement of vehicles is the ideal, if e.g. 20 extra vehicles could be dedicated to rabies in each of the four critical provinces for utilisation by existing or additional staff, much could be achieved. Sufficient and sustained access to communities and their dog populations is the key to rabies control.

The additional complication of vehicle hi-jacking needs to be addressed.

5.2.5 Logistics

Each of the critical provinces should consider establishing and maintaining central stores of needles, syringes, certificates, cooler boxes, ice bricks, etc. situated close to their focal areas to ensure a smooth and unbroken supply of consumables needed to conduct vaccination campaigns.

Public address systems should be built into vehicles and become the cornerstone for communicating with the public during campaigns. This would greatly improve the efficiency of communication during awareness and vaccination campaigns.
Accommodation and food needs to be provided for any additional vaccinators brought into an area.

5.2.6 Public awareness & compliance

Although vaccinating dogs would seem a simple enough procedure, several factors can adversely influence vaccine coverage in an area. Some of these factors are:

- Lack of awareness of the dangers of the disease to both animals and humans, especially if there have not been recent rabies cases.
- Many rural populations believe that the rabies vaccine is dangerous for their dogs! This could be because of e.g. distemper disease outbreaks following vaccination campaigns where dogs were congregated. This belief adversely affects vaccinated dog numbers in high-risk areas.
- Pet owners not at home when vaccinators are working in an area (their dogs and cats are then not vaccinated)

This is not an exhaustive list but illustrates the fact that Rabies education and good communication with dog owners is one of the cornerstones of a successful rabies campaign. The One health approach to utilising all available sectors could greatly assist in this awareness need. Training of Health CCG's could be one of the greatest assets.

5.2.7 Training of Veterinary Staff in the Provinces

Prior to embarking on any mass vaccination and awareness campaigns, training workshops should be held in all provinces, but prioritizing the 4 focus provinces, for:

- Campaign planning and management.
- Developing an awareness strategy.
- Animal handling and vaccination training.

- Ensure all animal handlers and vaccinators are vaccinated sufficiently against rabies.

5.3 Proposed Public Health Approach for the Prevention of Human Rabies (Supplied by DoH)

This section was developed in keeping with current national strategies and guidelines as well as international recommendations and standards including: The Global Strategic Plan for Elimination of Dog Mediated Human Rabies; the National Master Plan for the Elimination of Neglected Tropical Diseases (2019 - 2025); the National Strategic Plan for Implementation of the One Health Approach in South Africa (2020-2024); and the Updated Human Rabies Prophylaxis Guideline (14 September 2018).

Objective	Strategy	Activity
1. Foster inter-sectoral collaboration (One Health Approach)	Ensure optimal multisector preparedness and effective response for rabies at all levels through policies, guidance and governance	Develop a multisector response plan/SOP for investigating human rabies cases
		Include rabies in training agenda of outbreak response teams and adopt the One Health approach.
	Ensure alignment of guidelines with existing policies adopting the One Health approach	Align rabies control activities to the National One Health strategy and other policies such as the national NTD Strategy.
		Conduct rabies awareness campaigns
2. Ensure medical personnel, especially those in the four canine rabies endemic provinces, are well versed in Rabies – both the disease and PEP procedures.	Ensure universal access to quality human rabies diagnosis	Ensure timely specimen collection and transport to designated laboratory.
	Ensure there is an appropriately trained and skilled workforce in place to maximise the reach and impact of rabies elimination interventions	Ensure routine training and supervision of all relevant staff at all levels

	Ensure there is reliable data available to enable effective decision-making by strengthening surveillance for human rabies	Ensure that health care worker training agenda includes surveillance for rabies
3. Ensure availability of good quality PEP for treating people exposed to the rabies virus.	Establish a collaboration mechanism with pharmaceutical procurement to ensure consistent supply of rabies vaccines and immunoglobulin	Establish communication channels with rabies vaccine supplier
		Establish communication channels with rabies immunoglobulin supplier
		Develop an annual commodity quantification and forecast plan
	Ensure availability of rabies vaccines and immunoglobulin at all health facilities	Strengthen stock management and reporting systems to include rabies
		Establish mechanism to monitor the availability of rabies PEP in all *designated* health facilities
4. Co-ordinate Rabies research efforts	Strengthen coordination of research among stakeholders to generate the required information to guide policy development and implementation	Identify and prioritize research gaps in the fields of rabies and including the ecological and environmental factors
		Assist in creating synergies and facilitate the sharing of data between human, animal and environmental disciplines (researchers and research groups) in order to utilize resources cost effectively for benefit of everyone
5. Ongoing evaluation of progress towards “Zero by 30”	Strengthen partnerships and coordination to support the planning, execution and monitoring of elimination efforts	Establish collaboration with relevant government departments and jointly review rabies elimination targets at all levels
		Integrate rabies planning and coordination with local councils and community-based structures and monitor progress towards rabies elimination targets.

		Participate in rabies advisory group meetings and One Health initiatives at all levels
		Conduct impact assessment activities in Rabies (KAP?) endemic districts
	Ensure participation of the private sector in rabies elimination efforts.	Include the private sector in rabies control efforts such as training workshops, communication on rabies matters etc.

5.4 General Template for Canine Rabies Elimination

- ✓ Political and institutional support for the elimination of canine mediated human rabies by 2030
- ✓ Identify, support and empower a single operational person (plus a backup) to head up the anti-rabies drive within each province. Ideally, these operational persons within each of the 4 target provinces should be able to dedicate most of their time to Rabies control.
- ✓ Strengthen provincial Rabies Action Groups for provincial One Health mobilization: Include DOH, State Veterinarians, Private Veterinarians, animal welfare organisations, schools, local authorities, Laboratory Services, NGO's etc.
- ✓ Strategically increase the capacity of Rabies diagnostic services to improve surveillance and diagnostic turn-around time and reduce transport costs (Eastern Cape, Mpumalanga, and Limpopo Provinces). This may include strengthening local laboratory capacity to receive and correctly package samples to be sent to accredited laboratories as a matter of priority.
- ✓ Strengthen PEP systems through education, awareness and training of health professionals.
- ✓ Identification of key target areas and tailoring vaccination and awareness campaigns to specific areas based on local knowledge and local rabies epidemiological data.
- ✓ Adequate budgets, staff, vehicles, vaccine, syringes, needles, cool boxes, etc. should be readily and continuously available to adequately vaccinate a targeted area.

- ✓ Training (and vaccination) of campaign staff before campaign commences.
- ✓ Mass public awareness drive prior to vaccination campaigns to encourage owners to vaccinate their pets (boost vaccination numbers).
- ✓ On the ground daily supervision of vaccinating staff by identified and trained supervisors.
- ✓ Post campaign evaluation to assess level of success and make improvements for future campaigns.

5.5 Critical success factors

Critical to the success of the implementation of this strategy is to ensure:

(a) A clear chain of command for animal disease management as identified in The South African Veterinary Strategy (2016 – 2026).

(b) A commitment to the goal of "zero by 30" through funding and participation by all relevant government departments (DALRRD, DoH, DEFF etc.) at all levels (National, Provincial, Local) and the active encouragement of the participation of all other stakeholders.

(c) Identifying and supporting Rabies champions who will drive the processes necessary to achieve Zero by 30.

(d) A vigorous and ongoing Rabies awareness campaign in canine rabies endemic areas.

(e) Ongoing training and oversite of Veterinary Services personnel involved in rabies vaccination campaigns.

(f) Specific Rabies training for medical students just before they undertake their community service year and ongoing/repeated Rabies training for health personnel in the canine rabies endemic areas of the country.

(g) An uninterrupted supply of human rabies biologicals (PEP) and the correct utilization thereof by health professionals in both the public and private sectors.

(h) An efficient and reliable supply of a thermo-stabile canine rabies vaccine (includes an efficient procurement process)

(i) Establishing and maintaining one or more canine rabies vaccine banks for emergency use.

5.6 Monitoring and Evaluation

A Monitoring and Evaluation policy will be developed once the implementation plans for the nine provinces have been finalised. The indicators selected should be broadly applicable across the country as well as being in line with the M&E requirements of the SADC Strategy for the Elimination of Dog – Mediated Human Rabies.

6. Conclusion

A well-coordinated effort in the 4 key areas in South Africa along with buffer zones in neighbouring provinces should place RSA in a position to eliminate dog-mediated human rabies cases before 2030.

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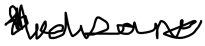

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