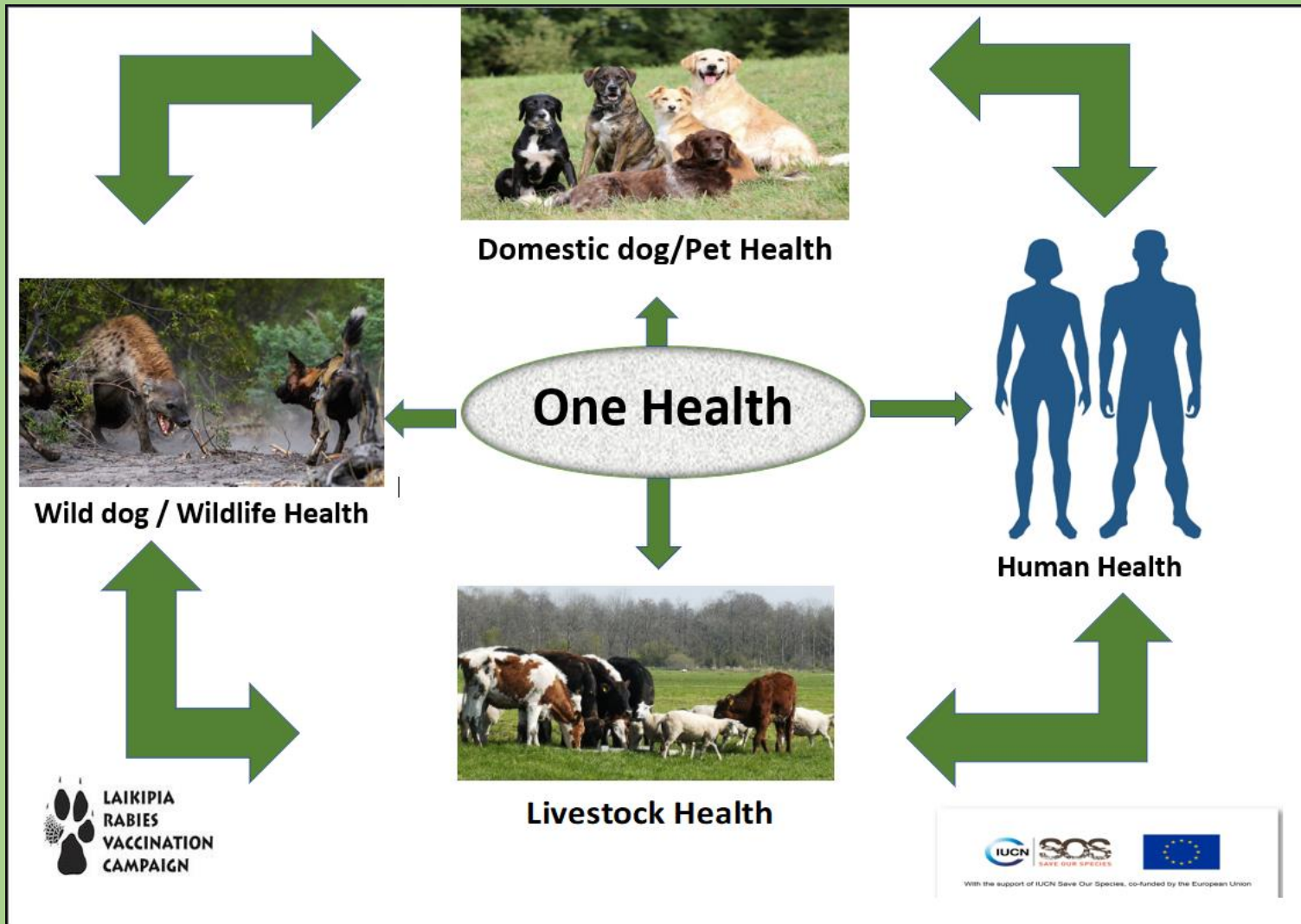


# PROMOTING ONE HEALTH - THE BID TO ELIMINATE CANINE-MEDIATED RABIES IN LAIKIPIA BY 2030



Every year the world health organization reports that globally over 59000 people die of canine rabies.

While rabies is a vaccine-preventable disease it sadly still occurs in over 150 countries and territories worldwide, where 99% of all human cases originate from domestic dogs. The Laikipia Rabies vaccination campaign aims to stop this spread by vaccinating dogs in Laikipia County. The viral disease is caused by the rabies virus – *Rabies lyssavirus* - and causes terminal encephalitis with 100% mortality in humans and animals, primarily spread via bites and scratches where saliva from infected animal contact broken skin or mucous membranes.



LRVC partners





## Background

Breaking the transmission cycle can be done best by mass vaccination of domestic dogs as these are easily accessible and this is also the most cost-effective of all methods. Overall vaccinating a dog against rabies costs about \$ 5, while administering the post-exposure vaccine to a human dog bite victim costs about \$ 110. First, this cost to public health planners is prohibitive, and secondly, not all the victims of dog bites may have information about PEP or the human vaccine may not even be readily available in rural areas, furthermore, considering that most victims of dog bites are children below the age of 15 years some dog bites may not even be reported at the appropriate time.

Furthermore, there are additional losses associated with rabies and dog bites that are not directly apparent i.e., economic loss while seeking PEP, absence from their income-generating activity, and the emotional burden of the possibility of a possible rabies infection (this is made a lot worse by the knowledge that the disease is incurable once symptoms appear otherwise referred to as the emotional burden).

Consequently, mass vaccination of domestic dogs is the most cost-effective way to break the cycle and thereby safeguard human health, wildlife health, and domestic animals' health.

The Laikipia Rabies vaccination campaign – LRVC is currently one of the most effective mass canine rabies vaccination programs in Kenya, the most consistent, and one of the programs recognized as a pilot for rabies elimination in Kenya by the year 2030. The program began in 2015, pioneered by researchers at the Mpala research center and localized in 5 neighboring communities around Mpala. The project has since grown to cover most of Laikipia County and is expected to grow further into part of Isiolo and Samburu counties soon.



### Comparison of various Rabies Vaccines

The average cost of Rabies vaccines		
Human Pre-Exposure rabies vaccination (Pre-Ep)	\$ 70 - 160	Ksh 7400 - 17000
Human Post-Exposure rabies vaccination (PEP)	\$ 110 – 260 (cost will significantly shoot if Immunoglobulin – HRIG/ERG - for extensive bites is needed)	KSh 12000 - 27000
Oral rabies vaccine for wildlife (ORV)	\$ 40 - 80	KSh 4500 - 8600
Canine rabies vaccine - regular	\$ 5 - 10	KSh 550 - 1100

(Ray T. Sterner, 2009)

### Photos from the Field



*A vet vaccinating a dog at Rumuruti in Laikipia west*



Continually the campaign aims to take advantage of the technology available to improve reach and coverage across Laikipia (use of GIS tools, radio adverts plus interactive live radio sessions), community education, and data management, as well as incorporate previous experiences to guide present and future campaigns. The 2022 program had an intentional priority to cover areas that are not normally prioritized by the government, areas where dog owners are less likely to afford annual rabies shots for their dogs, areas where owners are for some reason not likely to present their dogs for vaccination and also areas where wild dogs interact with the domestic dogs and livestock frequently.

Different from other years the campaign was also able to incorporate canine distemper vaccine in areas where domestic dogs/livestock herding areas and wild dog ranges intersect extensively.

### **The Goal of the Campaign**

Ultimately this program aims to eradicate rabies from the domestic dog population and is part of the One Health approach to end Rabies in Kenya by the year 2030, the target number is 16000 dogs which will roughly translate to 72% of the dog population in the county.

Additionally, this will also contribute to protecting the African wild dog – *Lycaon pictus* - which is on the IUCN red list as a threatened - endangered species

### **Partners**

LRVC 2022 was coordinated and led by a team from the Mpala wild dog team and assisted by planning and service input from the veterinary department of Laikipia county government plus volunteer students from Karatina University and a few researchers from Mpala.

Essential support partners; Mpala Research Center, Mpala ranch, IUCN, Darwin Initiative, The Samburu and Laikipia wild dog project, County government of Laikipia, Karatina University, The Field Museum of natural history, Kenya Long-term Exclosure Experiment, Ekorian-Mugie Conservancy, The Borana Conservancy, Ol Pejeta Conservancy, Solio Ranch Ltd, WVS – Mission rabies plus other individual supporters.

### **Implementation**

The LRVC is a rigorous all-out vaccination drive taking a total number of 6 weekends plus some additional days to cover areas left out or areas not covered effectively. This high-intensity program is aided by Volunteer university students and volunteer veterinarians and some researchers from



Mpala led by the Mpala Wild dog research team. A typical weekend would normally include 40 members distributed to 6 working teams, an accompanying medical nurse/clinical officer who administers the post-Exposure rabies vaccination in the event of a dog bite and a publicity/coordination team.

An individual team comprises 6 members, i.e., 2 veterinarians who carry out the rabies inoculations, they also guide owners on dog and cat handling plus advise owners on animal welfare or any animal health concern that may be raised or noted, 2 students who assist with data entry and logistics, a driver and a community guide.

The data collected via the WVS-mission rabies app include; the geolocation of each animal vaccinated, the animal's age, sex, reproductive status, whether vaccinated in the years prior, or whether owners would opt for sterilization of their pets.

Vaccination points are chosen to target a community cluster, a conservancy neighbor, or regular animal holding grounds where access will be easiest for most animals and hence high turnout. These locations are publicized in advance of the vaccination dates via a public address system, on-site posters, and through the provincial administration channels done by area chiefs. Every team is allocated three static points every day and they are allowed to 'roam' into homesteads when no more dogs are presented at the static point in a bid to increase the number of dogs vaccinated per area.

Upholding ethics and animal welfare considerations are insisted on every time and as a standard mode of operation, only the animal owner and the experienced veterinary surgeons are permitted to handle the animals, this is intentionally done to minimize dog bites and scratches from cats.

Dog bites are promptly treated first by a thorough cleaning with soap and water plus a disinfectant then the victim is attended to by a nurse with the requisite Post-Exposure Rabies vaccine for humans and finally referred to the nearest health center for completion of this treatment.





*Vaccination at Naibor in Laikipia North, Volunteer vets combine vaccination sessions with animal welfare and health advice to dog owners.*



*Dog with their owners waiting for their once-in-a-year rabies shot, the owners here will also be advised on best health practices for their pets/guard dogs.*





*LRVC volunteers' vets will go to great lengths to find dogs and vaccinate them.*





**LAIKIPIA  
RABIES  
VACCINATION  
CAMPAIGN**



**ZDU** REPUBLIC OF KENYA  
**ZOONOTIC  
DISEASE UNIT**



*Some of the team members during a break*



**LAIKIPIA  
RABIES  
VACCINATION  
CAMPAIGN**



Save

*LRVC 2022 'troops' ready to traverse vast Laikipia county to deliver rabies shot to a dog in community areas.*





*Community members are always advised on the best ways to handle both cooperative pets and unhabituated/aggressive herding dogs.*



### Dogs vaccinated per cluster area

Week	Dates	Areas	Vaccinations
1	14 <sup>th</sup> & 15 <sup>th</sup> Oct	Ilmotiok – Doldol - Ilpolei	514
2	21 <sup>st</sup> & 22 <sup>nd</sup> Oct	Naibor – Juakali - Muramati	2096
3	28 <sup>th</sup> & 29 <sup>th</sup> Oct	Rumuruti - Mouwarak	3456
4	4 <sup>th</sup> & 5 <sup>th</sup> Nov	Umande – Chumvi - Ethi	2163
5	11 <sup>th</sup> & 12 <sup>th</sup> Nov	Ngobit - Shalom – Solio	2276
6	18 <sup>th</sup> & 19 <sup>th</sup> Nov	Ngárua – Sipili - Karandi	1247
7	7 <sup>th</sup> Nov	Suguta - Ntabas	194
	23 <sup>rd</sup> – 25 <sup>th</sup> Nov	Marmamet - Muhotetu	1072
	Canine Distemper	Priority in wild dog range areas, Naibunga, Sossian, and parts of Segera.	814
<b>Total</b>			<b>13018</b>

The teams worked with over 230 vaccination points/community centers.



A newly vaccinated dog, this dog is now safe from rabies. The dog owners, other dogs, and wildlife too will be safe, as the rabies transmission chain gets disrupted.



## Challenges and lessons learned

In a bid to self-evaluate, the campaign continuously identifies hiccups, drawbacks, and attempts to mitigate against this promptly within the activity period and post-activity to ensure mistakes are not repeated and that improvements are made for the sake of future campaigns.

The following challenges were identified

- Negative perception in most areas of Laikipia North (this began after a concurrent outbreak of Canine distemper which killed dogs around the same time the 2017 vaccinations were ongoing), this one-time coincidental occurrence has been a central issue each year of the LRVC since 2017 and has mostly been in the Laikipia north area i.e., Ilmotiok, Waso, Musul, Doldol, and Kimanjo. The team has now begun remedial measures via sustained engagements with the community to educate and attempt to dispel this notion and deliberately fight misinformation.
- Priority by dog owners – since the campaign began, we have not had a major outbreak of rabies in the project area hence dog vaccination to owners who have not experienced a rabies outbreak is not a major priority and most would rather attend to their other issues first before presenting their dogs for vaccination on activity days, this is mostly the case in the agro communities of Ngárua, Karandi, Sipili, and Mweyogo.
- Synchrony with school terms – in Laikipia (and in Kenya generally) dogs are owned by boys, this means when they are in school the number of dogs presented for vaccination will be significantly less than if the campaign is done during school holidays.
- A long-term scientific study - LRVC has been going on for several years now and as part of the national rabies control and elimination pilot study, hence there is a need to escalate the scientific aspect by actively monitoring seroconversion levels (or lack of) in the project area.
- Rainy days are welcome and much needed at any time in the arid Laikipia, but rain is one of the project's top disruptions (if only we could predict the weather more precisely).
- There exists a knowledge gap in the epidemiologic relationship between rabies and canine distemper and this is a research opportunity for the project and Mpala Research Center in the future.
- Dog bites, the animal welfare aspect of dog handling, and dealing with unhabituated dogs pose an ongoing challenge since the campaign relies on a substantial volunteer group plus vets who may only have handled house pets and not the rarely handled herding dogs of Laikipia. Hence the need for strictly requiring that only dog owners or experienced veterinarians handle the dogs and also necessitating a pre-training before every campaign weekend commences.





- Should LRVC prioritize conservation areas with lower population density and more wildlife-domestic dogs interaction and hence a lower number of dogs vaccinated or should the target be the highest number of dogs possible
- Request for fertility clinics (spay and neuter surgeries), about half of owners presenting their dogs for surgeries have been requesting ways to sterilize their dogs while this is not within the scope of the project and should be a consideration in the future as it will add a positive population stabilization aspect which is in line with the objectives of rabies elimination.

### **The way forward plus recommendations**

The team proposes a slightly different approach to the 2023 campaign, changes being advised by immediate and prior experiences. i.e.,

- The team will conduct continuous extensive community engagements in problem areas in conjunction with relevant stakeholders e.g., the county government vet department, the area chiefs, opinion leaders and other local administration leaders, conservation groups and community development forums, etc.
- Areas that are hard to reach will be attended to and vaccinations are done before the main campaign commences.
- Low-turnout areas that intersect with the wild dog range will also be considered a high priority and vaccinations are done earlier.
- Explore ways of incorporating spay and neuter drives in key conservation areas where requests are consistent and if funding is possible, this will create a stable/vaccinated domestic dog population and thereby protect wild carnivores from the big three infectious diseases from dogs (Rabies, Canine distemper, Parvovirus) that can wreak havoc to conservation efforts.
- It is important to have some form of dog and cat first aid kit or field medication items to deal with cases presented and at least help that is in dire need of more than just the vaccine.
- Enhance the coordination with the county team to reduce expenses from Mpala as well as improve the epidemiologic awareness of the county team.
- Continually seek to deeply involve partner conservancies especially those with a large neighborhood population.
- Expand the campaign to cover all of Laikipia and key areas in neighboring Samburu and Isiolo counties.



- Standardize the training on handling unhabituated dogs and animal welfare and possibly disseminate some of this to schools and LRVC volunteers.
- Develop at least a publication per year from the data generated over the years to ensure that these valuable lessons and strategies are beneficial in the future or in other parts of the world concerning rabies control and elimination.
- To avoid the complications resulting from deaths from canine distemper, could the project put in place a canine distemper surveillance mechanism, especially in areas intersecting with wild dog ranges?

## Conclusion

Canine-mediated rabies remains a global risk, more so in rural areas of developing countries, and without consistent preventative measures, more lives will continue to be lost. And while mass domestic dog vaccinations are challenging to run due to the cost and resources needed, they are the most effective way to halt the spread of rabies from reservoir hosts to other domestic animals, to humans, and wild animals – especially wild dogs. And until the disease is finally eliminated, consistently hitting 70% vaccinations per population in consecutive years is very critical and LRVC is committed to achieving this goal.

The LRVC planning team wishes to thank all the partners and sponsors of this initiative, most importantly to the Mpala research center and the IUCN for facilitation and research guidance to date, the Samburu, Laikipia wild dog research team for the field knowledge and expertise, the county government of Laikipia for ensuring the campaign was never short of veterinarians volunteers, the conservancy partners (Borana conservancy, Mugie conservancy, Solio ranch conservancy, Ol Pejeta conservancy) for allowing the use of their vehicles and other resources as this project will be greatly handicapped without the conservation community's support, and finally the goodwill of Laikipia communities who host conservation areas.

**From The LRVC team – [Dedan, Martin, Celine, Susan, Dr. James,  
Volunteers, and Community Members]**

**Gracias**