ELIMINATING HUMAN RABIES: IMPACT OF ENHANCED VACCINATION COVERAGE.

RCT IMPLEMENTATION MANUAL

Preamble

A manual describing the implementation of mass dog vaccination, data collection, vaccination equipment and the human resources involved. The location of the activities will be Mara region in Tanzania. The project will be implemented by frontline animal health workers from the Ministry of Livestock and Fisheries Development assisted with One Health Champions from the community and under the guidance from the research team from Global Animal Health Tanzania and other allied institutions.

Definitions

Research Team (RT): the Project Coordinator, Project Assistant Coordinator or other researchers involved in the implementation of this project.

Rabies Coordinator (RC): the Livestock Field Officer or Agricultural Extension Officer whose job is to vaccinate dogs in his/her ward

District Livestock and Fisheries Development Officer (DLFO): a state veterinarian or other person in charge of livestock in a district.

MDV: Mass Dog Vaccination

One Health Champion (OHC): a village based-person, influential and respected in the community responsible for mobilizing the community to participate in the MDV campaigns.

Passive Cooling Device (PCD): a device used to store vaccines for extended period without need of electrical power to run.

Pulsed MDV: the delivery of MDV through teams of vaccinators travelling to a village using vaccines stored in refrigerators in the District Veterinary Office

Continuous MDV: the delivery of MDV coordinated by a ward-based Rabies Coordinator and a village-based One Health Champion using vaccine stored within a PCD stored locally

RC base: the location where the RC stores the Zeepot and the other vaccination equipment. This might be in the RC's own home or another appropriate location in the RC's village.

Zeepot: a Passive Cooling Device used to store rabies in this study

Further definitions (eg. of house to house strategy and central point strategy) are given in Part II – Intervention strategies.

LGA: Local Government Authority

Part I

Introduction (nontechnical)

A major challenge facing elimination of rabies in rural areas of Tanzania is the difficulty the government veterinary teams face in having to travel long distances to vaccinate dogs and the high costs involved. Another challenge is storing vaccines in remote communities where refrigeration units are scarce.

Government veterinary teams typically conduct vaccination campaigns once per year in each village. This approach is referred to as the '***pulsed***' vaccination delivery. In-between these periods vaccination does not take place and as a result the proportion of vaccinated dogs declines rapidly due to natural death of a proportion of vaccinated dogs and birth of new (unvaccinated) puppies. Consequently, the proportion of vaccinated dogs declines and can fall below the level required to prevent the transmission of rabies.

Research has shown that, following storage outside of refrigerators for extended periods, the dog rabies vaccine (Nobivac) remains potent and can still be used to effectively vaccinate dogs against rabies. This means that the rabies vaccine is 'thermotolerant'. The discovery that the rabies vaccine is thermotolerant and the subsequent development of locally made Passive Cooling Devices, called Zeepots (in which vaccines can be stored below ambient temperatures without power) has led to the design of new decentralized MDV delivery strategies in which a) vaccines can be stored for extended periods in remote communities, and b) village-based Rabies Coordinators (RCs) can be employed to provide vaccination to dogs in their villages continuously throughout the year. This approach is referred to as the '***continuous***' vaccination delivery. The hypothesis is that this method will result in more dogs being vaccinated than the pulsed delivery strategy.

The aim of this study is to carry out a trial to compare continuous and pulsed MDV and to determine the best way to implement continuous vaccination delivery for vaccinating dogs. The objective of this implementation manual is to describe how continuous mass dog rabies vaccination will be carried out and the roles and responsibilities of those involved in the study.

PART II - Continuous mass dog rabies vaccination

The following text describes how continuous mass dog rabies vaccination will be implemented:

There are three different delivery method options that will be employed for continuous mass dog rabies vaccination:

i) **Central -point clinics:** A vaccination clinic is set up by RC and OHC in a central point in the village, and dog owners are requested to bring their dogs to the clinic. Each clinic will be managed by the RC and the OHC. In addition, the RC will employ the help of a village-based assistant who will assist with the activities.

ii) **House-to-house clinics (H2H):** In this method the RC and OHC will travel on foot or bike from household to household in a systematic manner looking for households with unvaccinated dogs. The H2H will be carried out by both the RC and the OHC of the village. This method can be used in month 3, 6 and 9 in addition to, or in place of, the central-point delivery when the RC considers it the most efficient method to reach dogs that the OHC has identified needing vaccination.

iii) **On demand vaccination:** In addition to the two methods above, the RC will respond ***throughout the year*** to dog owners alerting them that their dogs need vaccinating. In these instances, the RC can visit the owners' houses to vaccinate the dogs. Alternatively, the RC and OHC can ask the dog owner to bring their dogs to a specified location where they can meet to vaccinate the dogs.

Timing of the delivery strategy

Month 1: The Rabies Coordinator will work with the village-based One Health Champions (OHC) to deliver a **central point** clinic in month 1 at the village level.

Month 3: After the activities in month 1 are completed, the OHC will continue to compile a list of dogs in the village that either missed the central point vaccination in month 1, or are new dogs that have been brought into the village, or are puppies that have recently been born since month 1. These dogs will then be vaccinated when the RC returns to the village in months 3.

Month 6 and 9: The OHC will continue to compile a list of dogs in the village that have not been vaccinated (new dogs, puppies or those that simply missed the previous vaccination rounds in months 1 and 3). These dogs will then be vaccinated when the RC returns to the village in months 6, or 9.

How should the dogs be vaccinated in months 3, 6 and 9?

The RC together with the OHC will decide whether the dogs requiring vaccination in months 3, 6 and 9 should be brought to a central point for vaccination or whether these dogs would be better reached through a H2H approach. For example, if there are sufficient dogs requiring vaccination then it may be more efficient to ask all of the owners to bring their dogs to a central point on a certain date / time to receive vaccination. Alternatively, if the RC and OHC decide that it would be quicker, they can visit the dog owners' individual homes through a H2H method to vaccinate the dogs.

Additionally, because we do not want dogs to have to wait for the hosting of clinics to be vaccinated, the RC can also respond to **On Demand vaccination** throughout the year as and when they are notified by dog owners that a dog requires vaccination.

Step by step instructions of how to implement the first vaccination campaign in Month 1: (detailed instructions for each activity are given in. the Annex)

Step 1: **Introduction of OHC:** Research Team will forward the name of each village level implementer (OHC) selected in each village to the DLFO and will request an introductory letter be drafted for each of them. Upon receipt of the letter the OHC will call a village leaders' meeting with all sub-village chairmen present to discuss the vaccination activities, his / her extended role and community support for the project. The OHC shall forward report of this meeting to Research Team before start of campaign.

Step 2: The OHC will ask sub-village leaders to estimate the number of dogs living in their administrative area and to communicate the results to the OHC. The OHC will then inform the RC how many dogs they estimate live in their village.

Step3: Upon receiving the estimates, the RC will calculate the total dog population in the ward. This will be done by adding the number of dogs in each village within the ward

Step 4: The RC will request this number of vaccines from the DLFO. This batch of vaccines will be collected by the RC from the DLFO office (see annex for detailed instructions)

Step 5: The RC in collaboration with each OHC will prepare the schedule for implementing the vaccination campaign in each village within the ward. Each village-based OHC will communicate the vaccination plan to the village leaders and then to the community by advertising (detailed in the annex).

Step 6: The RC and OHC will host the vaccination campaign according to their schedule.

Part III

Roles & Responsibilities of Implementers

a) Research Team

i. Procurement of vaccines and vaccination equipment, and distribution to the offices of DLFOs
ii. Jointly with the DLFOs offices, monitor storage of vaccines and vaccination equipment, and their distribution to the wards
iii. Jointly with the DLFOs offices, monitor and evaluate activities of RCs and OHCs

b) District Livestock and Fisheries Development Officer

i. In collaboration with RC, supervise continuous mass dog vaccination (MDV) activities in his/her LGA.
ii. Issue letter to community leaders introducing OHC and the scope of their work in the control of rabies

iii. In collaboration with senior LFO based at LGA headquarter, organise and supervise implementation of pulsed MDV and collection of vaccination data.
iv. Ensure vehicle and other equipment required by pulsed team are in working order
v. Manage stocks of vaccines and vaccination equipment
vi. Oversee storage at the DLFO office of vaccination equipment required for pulsed MDV and their disbursement to RCs at the ward level
vii. Report, request and take delivery of vaccines and the vaccination equipment from the research team, when this equipment is running low
viii. Monitor activities of RCs and OHC

c) Senior Livestock Field Officer

i. Jointly with the DLFO, coordinate vaccination activities in all wards that fall under the pulsed MDV.
ii. Prepare vaccination schedule and communicate it to the DLFOs and the LFOs that will be assisting with pulsed MDV
iii. Vaccinate dogs and collect vaccination data in all wards that fall under the pulsed MDV
iv. Upload collected data via internet to server on daily basis

d) Rabies Coordinators

i. Manage and coordinate continuous MDV strategy
ii. Manage storage of vaccines (within the Zeepot PSDs) and other vaccination equipment within their ward. This includes safe keeping of the mobile phone on which the vaccination data will be stored and uploaded to the internet.
iii. Meet and liaise with OHC, community leadership and community members themselves to introduce new strategy
iv. In association with the OHC, coordinate house-to-house and central point vaccination clinics within each village of their respective wards (see Part II for definitions)
v. Inoculate animals during vaccination
vi. Provide each owner with a vaccination certificate
vii. Enter a registration number for each dog on the vaccination certificate (see Annex for details)
viii. Collect data on every vaccinated dog by entering registration data and dog's photograph into a mobile phone-based application
ix. Ensure dog's data is also written into the Vaccination Register book
x. After each vaccination session (e.g. after one or two day's vaccination activities), find internet connection so that registration data collected on the mobile phone-based application is uploaded to the internet
xi. Schedule and carry out regular weekly communication with OHC via mobile phone to be updated on dogs requiring vaccination and other rabies related issues
xii. Report on vaccination activities to the Research Team and DLFOs offices

xiii. Monitor rabies incidence and report to the Research Team and DLFOs offices
xiv. Coordinate delivery of fresh stocks of vaccines and vaccination equipment from DLFOs offices by motorbike
xv. Record daily vaccine storage temperature within the Zeepot
xvi. Submit temperature data to Research Team via online form.

e) One Health Champions

i. In association with ward-based RC, manage and coordinate all MDV activities in their respective village
ii. In association with ten-cell leader / Balozi, estimate how many dogs live in each Balozi (see Annex for instructions)
iii. Inform RC of the estimated number of dogs living in the village
iv. Sensitize villagers about forthcoming vaccination activities / clinics
v. In association with ten-cell leader / Balozi, monitor village dog population, determine which dogs have not been vaccinated, which females are pregnant and which litters require vaccination
vi. Carry out advertising before campaigns
vii. Record keeping on vaccinated animals by entering data into a Vaccination Register during MDV activities carried out with RC
viii. Prepare weekly report about the number of dogs that require rabies vaccination during each forthcoming vaccination clinic and other rabies issues to be discussed with RC during weekly update phone call

Annex

Details of each activity:

I. ESTIMATING DOG POPULATION

a) How to estimate the dog population in the village

Procedures:

1. The OHC will determine the number of dogs living in each sub-village from his/her database, or consult with sub-village chairs and ten-cell leaders (Mabalozi) where necessary to estimate dog populations in their compartments.
2. The OHC will inform the RC of the estimated total number of dogs living in each sub-village before the beginning of vaccination activities.
3. The RC will add up the estimated dog population of each sub-village to calculate the total dog population for each village within the ward.
4. The RC will add up the estimated dog population of each village to calculate the total dog population for the ward.

b) How to receive notice of litters and arrival of new dogs

1. During the community sensitization, advertising and the vaccination days, the OHC will make their mobile numbers available to the community; instructions will be given that the OHC should be alerted when litters of puppies are born in the village or when new dogs are brought to live in the village.

2. Additionally, OHCs will conduct regular visits to households, they will enquire from households that they visit whether they have new dogs or dogs that were not vaccinated during the central point campaign or a new litter of puppies.

3. The OHC will compile list of puppies, new dogs or dogs that were not vaccinated during the last round of vaccination campaign and communicate with the RC to plan to vaccinate these animals at the next opportunity.

4. Plans will be made with the RC for any unvaccinated puppies and dogs to be inoculated and biodata taken and certified accordingly.
5. During visits, the OHC will take note of pregnant dogs and keep records of them so that they know when to expect a new litter of puppies (given that pregnancy of a dog is 60 days).

II. Vaccine requisition, collection and management

a) How the RC will coordinate delivery of fresh stocks of vaccines and inventory of vaccination equipment

1. The estimated total dog population living in each sub-village will be communicated by the OHC to the RC (as above)
2. After receiving this information from the OHC, the RC will calculate the number of doses of vaccine that they require for the first SIX months FOR EACH VILLAGE within their wards.
3. We expect during the central point activity hosted in month 1 and subsequent vaccination campaigns held between month 2 and 6 the RC will be able to vaccinate approximately 80% of the total village dog population. Therefore, the number of vaccines to be requested by the RC for EACH of the villages in their ward will equal 80% of EACH village dog population.

   For example, in Gorong'a ward, if the estimated total village dog population for Kitawasi village is 600 dogs, the RC will calculate what 80% of 600 dogs is by multiplying 600 by 0.8. This gives 480 dogs, which is 80% of the dog population for Kitawasi. This is the quantity of vaccines that the RC estimates they will need for the first six months for Kitawasi village. The RC will perform the same calculation for each of the villages in their ward. Following this the RC will add up the number of doses required for each village to calculate the total number of doses required for the ward.

   For example, in Gorong'a ward there are 4 villages. If the number of doses required for Kitawasi village is 480 doses, and assuming the number of doses calculated for Masurura Village is 370 doses, the number for Masanga is 350 doses and for Kenyamosabi Village is 410 doses. Then the total number of doses to be requested by the RC from the DLFOis 480 + 370 + 350 + 410 = 1610 doses for Gorong'a Ward.

4. The RC will request this number of doses from the DLFO by WhatsApp **<u>in advance of travelling to the DLFO's office</u>**.
5. The RC must wait to receive a confirmation WhatsApp message from the DLFO confirming the time and date to visit the office to collect the vaccines.
6. The RC will then travel to DLFO's office by motor bike (or car where necessary) to collect the vaccine doses. **The RC must take the cool box provided by the project with them.**
7. On arrival at the DLFO office the requested number of doses will be taken out of the refrigerator and placed carefully inside the cool box.
8. The DLFO will enter the number of doses taken by the RC in the Vaccine Dose Register
9. The RC will sign the Vaccine Dose Register confirming receipt of the doses. The Vaccine Dose Register will remain in the DLFO's office.

10. The RC will travel back to their village with the batch of vaccines by the same means of transport
11. On arriving home, the RC will place the vaccines inside the Zeepot

b) How to request and receive more vaccines after every six months

1. One week before the end of the sixth month of each six-month period, the RC will request a new batch of vaccines for the next six-month period from the DLFO by WhatsApp. The number of doses of vaccine to be requested will equal 50% (half) of the number requested in the first six-month period.

   Example: F*or Gorong'a ward 1610 doses were requested during the first six-month period. As such, in the second six-month period only 805 doses will be requested in total for Gorong'a ward (this is 1610 ÷ 2 = 805). Of these, 240 doses will be used for Kitawasi village, 185 for Masurura village, 175 for Masanga and 205 for Kenyamosabi village.*

2. The RC will also return to the DLFOs office any doses of vaccine from the previous six-month period that were not used. To do this the RC will take the unused doses from the Zeepot and place them into the cool box.
3. The RC will travel with the cool box to DLFO's office by motor bike (or car where necessary)
4. On arrival at the DLFO office the unused doses will be given to the DLFO. The vials will be marked with a permanent marker pen with an 'X' and will then be placed in a box labelled 'UNUSED DOSES" inside the refrigeration unit.
5. The DLFO will enter the number of doses that were returned into the Vaccine Dose Register
6. The RC will sign the Vaccine Dose Register confirming the number of doses that were returned
7. The requested number of **new doses** will be taken out of the refrigerator and placed carefully inside the cool box.
8. The DLFO will enter the number of new doses taken by the RC in the Vaccine Dose Register
9. The RC will sign the Vaccine Dose Register confirming receipt of the doses
10. The RC will travel back to their village by the same means of transport
11. On arriving home, the RC will place the vaccines inside the Zeepot

c) **Marking unused doses to ensure they are appropriately labelled:**

On receipt of any unused doses the DLFO will mark every vial with a black marker pen with a large 'X' which will indicate to the research team that these doses have been stored outside of cold chain conditions for six months. These vaccines will still be viable if kept under cold chain conditions thereafter. Therefore, all unused doses must be kept by the DLFO inside the refrigeration unit until they are delivered to the research base.

III. Vaccination equipment and management of waste

a) Receiving new equipment for vaccination activities

1. The RC will collect the required vaccination equipment from the DLFO every time they collect vaccines.
2. The number of needles and syringes received by the RC in the first six-month period, and in each subsequent six-month period, will equal the number of doses of vaccine received. This is because each dog vaccinated will be done with a new needle.
3. Each vaccination certificate can be used for up to 4 dogs. Therefore, a household will only need one vaccination certificate for every 4 dogs that live there. As many households have more than one dog, the number of vaccination certificates that each RC will require has been estimated to be 75% of the number of doses required.
   Example: In *Gorong'a ward 1610 doses were requested for the first six-month period. The number of vaccination certificates required will equal 1610 x 0.75 = 1207*

4. Every time the RC visits the DLFOs office to collect new batches of vaccines they will also receive this equipment. The equipment must be taken home and stored inside the Rabies Free Tanzania trunk

b) Disposing of used needles, syringes and vaccination vials

1. The RC will take the small waste disposal unit and two ziplock bags with them when they travel for vaccination duties
2. After each vaccination the used needle will be removed from the syringe and placed inside the small waste disposal unit
3. On returning to the base, the RC will empty the needles from the small waste disposal unit into the large waste disposal unit. The used syringes will be burnt.
4. When the large waste disposal unit is full the RC will take it to the DLFO office for disposal. This can be done during a six-monthly visit to collect vaccines.

c) DLFO Equipment list

1. Vaccine Dose Register book
2. Marker pens
3. Refrigeration unit

d) RC equipment list

1. Metal trunk and Rabies Free Tanzania sticker
2. Day bag for carrying vaccination equipment
3. Dog muzzles x 2 (one large, one medium)
4. Temperature logger x 1
5. Zeepot x 1
6. Registration book x 1

7. ZEEPOT temperature data log book x 1
8. Marker pens
9. Accounts register book x 1
10. Large waste disposal bin for needles (to be stored at the RCs base)
11. Small waste disposal bin for needles (that can be taken with the RC on the vaccination duties)

e) Equipment needed for central point vaccination

1. Cooling box
2. Vaccines
3. Syringes & needles
4. Registers and pens
5. Muzzles
6. Smart phone
7. Waste bin
8. Vaccination Certificates
9. Pens
10. Table and 2 chairs
11. Loudspeaker

f) Equipment needed for house-to-house vaccination

1. Cooling box
2. Vaccines
3. Syringes
4. Muzzles
5. Smart phone
6. Vaccination Certificates
7. Pens

IV. Advertisement of vaccination campaigns

a) How to introduce vaccination strategy to village

1. RC and OHC will arrange a meeting with stakeholders at the village level: including village executives and representatives of local schools, NGOs, local firms (if any), churches, mosques and neighbourhood groups
2. The purpose of the meeting will be to sensitize the village leadership on the burden of rabies, the benefits of mass dog vaccination, the planned intervention and what the RC and OHC's roles will be towards successful implementation of the intervention
3. This meeting should be held 7-10 days before the commencement of the campaign and any issue needing attention should be directed to the DLFO's office or the research team

b) How to advertise and inform villagers about forthcoming campaigns

RC and OHC will inform villagers about forthcoming campaigns the day before using the village advertiser and communication materials (see below)

c) Creating posters and announcements

The research team will produce template advertising posters and will deliver them to the office of the DLFO. The posters will contain messages that encourage people to bring their dogs/cats for vaccination. Each poster will have blank spaces to allow users (RCs) to fill information explaining which village will be targeted, date of vaccination, the vaccination point, the start and end time.

With regard to announcements, the OHCs will either record the announcement and play it while moving across the sub-villages or prominent areas, alternatively OHCs will make live announcements.

d) How to advertise a day before central point campaign

1. The OHC will make announcements at popular places like schools, market squares, churches and mosques using posters, loudspeaker or word of mouth.
2. The RC and OHC will encourage/mobilize community members to bring their dogs for vaccination on the specified date

e) How to advertise house-to-house campaign

1. If the OHC together with the RC have planned to target a certain number of Mabalozi by house-to-house campaign, the OHC will inform the Balozi of each targeted ten cell unit a number of days in advance about the plan for the house-to-house campaigns
2. The Balozi will then be asked to inform all of the households in the ten-cell unit about the planned house to house vaccination activity and when it will happen

f) Recruitment of village-based assistant

1. A village-based assistant will be selected from among the members of each village
2. He/she should be at least standard seven leaver and able to read and write properly
3. The RC will train him/her how to enter written data into the Vaccination Register and help to restrain dogs for vaccination if the dogs can't be handled by the owners.

V. Carrying out vaccination campaigns

a) How to conduct central point campaign

1. Vaccination team (RC, OHC and one village-based assistant) will arrive at the central point site at 0800 hours.

2. Two stations need to be established, approx. 20 metres apart: i) registration station and ii) a vaccination station

3. When owners and their dogs begin to arrive, the RC and OHC will organize them into queues to ensure first-come first-served

4. Owners will visit the registration station first to have all their dogs registered prior to visiting the vaccination station (see section: **Registration of every owner and every dog**). Registration data will be entered into the smart phone mobile app and written into the Vaccination Register. A photo of the dog will be taken using the smart phone mobile app.

5. The OHC and the assistant will be responsible for entering written data into the Vaccination Register and completing the Vaccination Certificate

6. The RC will be responsible for entering data into the mobile phone registration app and taking a photo of each dog.

7. Once all registration data has been collected, the RC will be responsible for inoculating dogs with vaccine

8. As soon as all dogs are vaccinated, the owner will be given the Vaccination Certificate and must be encouraged to walk home to avoid crowds of dogs forming

b) how to conduct a house-to-house campaign

1. OHC will identify households with unvaccinated dogs that require house-to-house vaccination
2. He/she will compile the list and present/submit to the RC during their weekly telephone meetings
3. The RC and OHC will set date and time for the visit of those households and the OHC will inform the dog owners to make sure that the owners are at their household with the dogs at the correct time.
4. The dog owners will also confirm that they will be at home to receive the team and restrain all dogs that need vaccination.
5. On the date of appointment, the RC and OHC will travel on foot or bike to reach those households and vaccinate any dogs.
6. The RC will be responsible for entering data in the smart phone mobile app and vaccinating the dog, whilst the OHC will record data in the Vaccination Register, write and provide the Vaccination Certificate

VI. Dog registration, certification and data collection

(Sequence of events: registration/certification => tying of collar => inoculation of animal

Vaccination data will be collected by the RC using the Rabies Free Tanzania App installed in the RC's smartphone and by OHC using the customized Vaccination Register book. Both systems will be used simultaneously whenever the vaccination campaign is conducted.

a) How to collect data using the Vaccination Register

A customized Vaccination Register will be filled by the OHC using a pen and kept by the RC at the ward level. The owner will provide details of all of the animals to be vaccinated. The details that will be recorded will include: Name of owner, Sex of owner, Animal species (dog/cat), Name of animal, Age of animal, Sex of animal and Location (Village, sub-village). Data from the registers will be used as a back-up for entry into the project computer as needed

How to register dogs

Vaccinated dogs will be issued with a registration number upon first registration. The dog registration number will contain information pertaining to:

- LGA and village they live
- Year of first registration
- Vaccination number

The names of the LGA and village will be abbreviated using three initials.

For example, the first dog to be vaccinated in 2020 in Nyamoko village in Serengeti District Council will have the following registration number: SDC/NMK/2020/01

b) Provision of vaccination certificates

A Vaccination Certificate will be completed by the village-based assistant appointed by the RC. The details of 4 dogs can be entered on a single Vaccination Certificate. The owner will be given the Vaccination Certificate only after all of the owner's dogs have been vaccinated. The owners will be told that one vaccination certificate is for multiple dogs and will be used up to 3 years. They must be told to keep the certificate in a safe place as it is proof that their dog has been vaccinated. They will be told to bring it during subsequent vaccination events.

c) How to collect data using Rabies Free Tanzania App

Data collection using the Rabies Free Tanzania App will be taught to the RCs during the training. Briefly the RC will enter geographic, owner and dog information data into the app. Geographic information will include LGA, Ward, and village. Age, mobile number, family name will be collected from each person bringing the dog for vaccination. Dog information will include pet name, gender, color, presence of visible scar and a photo. Step by step data collection will be illustrated during the training

Data submission

- The RC will submit data from their smartphone to the server after each vaccination session. A session may last up to two days. As such a vaccination session can be suspended at the end of a single day and re-started the following day if further vaccination activities are planned for the day after. After the second day, and to avoid accidental loss of data, the RC must find a place with good internet connectivity so that the data can be submitted.
- The vaccination records will be kept on a remote server, whilst downloaded copies will be stored locally in the project computer.

VII. **How to vaccinate the animals**

1. The RC will show the owner how the dog/cat can be restrained safely.
2. The owner will restrain the dog/cat.
3. If the dog is aggressive then the RC will place a muzzle on the dog prior to vaccination
4. OHC will estimate the circumference of the neck of the dog and cut a proportionate length of the collar and give it to the dog owner.
5. The dog owner will wrap the collar around the neck
6. A new needle will be placed on the syringe
7. The vaccinator will draw up 1 ml of vaccine into the syringe.
8. The RC will administer 1 ml of rabies vaccine sub-cutaneously in the scruff of the dogs neck
9. The needle will be disposed of in the sharps bin.

VIII. Vaccine Storage in the Zeepot and Temperature monitoring

a) How to care for Temperature Controlled Storage System (Zeepot)

The Zeepot will be stationed at the ward level. The device will be kept indoors in an appropriate location, preferably in the RCs own home, at the corner of the room.

Setting the Zeepot:

1. Select the area to place the Zeepot, the floor should be flat, and the location not in direct sunlight
2. Put the smaller pot in the big pot
3. Add sandy soil up to the mark(circular black line placed in the inner wall of the outer pot)
4. Add water until the soil is wet
5. Put the vaccine vials in the inner pot
6. Place the lid of a temperature monitoring device (Neoteck^{TM}) in the inner pot and place the data logger RC-5+ on the wall
7. Cover the inner pot with lid

8. Keep the lid on at all times, except for when removing vaccines or reading temperature monitoring device

b) Daily temperature recordings

1. RC will record daily temperatures in and outside of the Zeepot from the temperature loggers
2. Minimum and maximum temperature recordings will be taken each day
3. The RC should read the minimum and maximum temperature recordings for each day from the loggers after 6pm to ensure that the maximum temperature has been passed
4. The recordings will be entered into the register.
5. At the end of each week the RC will take a photo of the weekly temperature data from the register and send it to the project team by WhatsApp.

IX. Monitoring and evaluation

a) Communication and feedback to the community

- After the first round of clinics and collection of study data, the research team will give feedback to communities regarding vaccination coverage
- Three (3) to six (6) months after the first round of vaccination, a 3-member committee selected by the village executive will conduct community self-monitoring to see if RCs, OHCs and villagers are working effectively to ensure all dogs are vaccinated
- The research team will conduct monthly review meetings with RCs and OHCs to see if they are complying with the process and address any challenges, they may be facing in the field
- RCs will provide a summary report (including the number of dogs vaccinated and rabies related events) to DLFO's office/research team using WhatsApp on their smart phones
- Research team will use the data provided by the RCs to estimate the coverage achieved in each village
- DLFO's office/research team will provide feedback to communities through RCs and OHCs
- RCs and OHCs will communicate recommendations from the communities to the DLFOs / Research team to enable recommendations to be implemented

b) Reporting of rabies cases to RCs and OHCs by community members

- RCs and OHC will put their mobile numbers on the posters and vaccination certificates.
- Community members will contact the RC through the OHC via mobile phone or word of mouth immediately upon suspicion of a rabid dog or dog biting someone for further investigation
- The RCs and OHC will also enquire of households during their routine visits whether they know of any cases of people or animals being bitten by a suspected rabid dog
- The RC will notify the research team who will contact the surveillance team to follow up the case.

X: Timeline indicating major field activities 2020-2023

YEAR 1: 2020

Time	Who	Activity
26/**02**–24/**04** 2020	All 9 LGAs	Training of implementers
04/**05**/ 2020	DLFO, RC OHC, RT	Begin month 1 vaccination campaign
04/**08**/2020	DLFO, RC OHC, RT	Begin month 3 vaccination campaign
04/**11**/2020	DLFO, RC OHC, RT	Begin of month 6 vaccination campaign
09 - 13/**11**/2020	All RCs	RCs place request for vaccines & consumables from the DLFO office for the second term (months 7 – 12)
12 -13/**11**/2020	DFLO & RT	DFLO compile and submit requests for vaccines & consumable to research team
16-30/**11**/2020	RT & DLFO	Research team procure and supply vaccines and other consumables to the DLFO office
16-30/**11**/2020	RC & DLFO	RCs return unused vaccines to the DLFO office and collect fresh stock of vaccine and consumables DLFOs mark unused doses of vaccines, and store in cold-chain.
04/**02**/2021	DLFO, RC,OHC& RT	Begin of month 9 vaccination campaign and end of year 1 vaccination activities

YEAR 2: 2021

Time	Who	Activity
08-12/**03**/2021	All RCs	RCs place request for vaccines & consumables from the DLFO office for the second term (months 1 – 6)
15-19/**03**/2021	DFLO & RT	DFLO compile and submit requests for vaccines & consumable to research team
22/**03**-04/**04**/2021	RT & DLFO	Research team procure and supply vaccines and other consumables to the DLFO office
04/**04**/2021	RC & DLFO	RCs return unused vaccines to the DLFO office and collect fresh stock of vaccine and consumables DLFOs mark unused doses of vaccines, and store in cold-chain.
04/**05**/2021	DLFO, RC OHC, RT	Begin month 1 vaccination campaign
04/**08**/2021	DLFO, RC OHC, RT	Begin month 3 vaccination campaign
04/**11**/2021	DLFO, RC OHC, RT	Begin of month 6 vaccination campaign
09 - 13/**11**/2021	All RCs	RCs place request for vaccines & consumables from the DLFO office for the second term (months 7 – 12)
12 -13/**11**/2021	DFLO & RT	DFLO compile and submit requests for vaccines & consumable to research team
16-30/**11**/2021	RT & DLFO	Research team procure and supply vaccines and other consumables to the DLFO office
16-30/**11**/2021	RC & DLFO	RCs return unused vaccines to the DLFO office and collect fresh stock of vaccine and consumables DLFOs mark unused doses of vaccines, and store in cold-chain.
04/**02**/2022	DLFO, RC, OHC& RT	Begin of month 9 vaccination campaign and end of year 2 vaccination activities

YEAR 3: 2022

Time	Who	Activity
08-12/**03**/2022	All RCs	RCs place request for vaccines & consumables from the DLFO office for the second term (months 1 – 6)
15-19/**03**/2022	DFLO & RT	DFLO compile and submit requests for vaccines & consumable to research team
22/**03**-04/**04**/2022	RT & DLFO	Research team procure and supply vaccines and other consumables to the DLFO office
04/**04**/2022	RC & DLFO	RCs return unused vaccines to the DLFO office and collect fresh stock of vaccine and consumables DLFOs mark unused doses of vaccines, and store in cold-chain.
04/**05**/2022	DLFO, RC OHC, RT	Begin month 1 vaccination campaign
04/**08**/2022	DLFO, RC OHC, RT	Begin month 3 vaccination campaign
04/**11**/2022	DLFO, RC OHC, RT	Begin of month 6 vaccination campaign
09 - 13/**11**/2022	All RCs	RCs place request for vaccines & consumables from the DLFO office for the second term (months 7 – 12)
12 -13/**11**/2022	DFLO & RT	DFLO compile and submit requests for vaccines & consumable to research team
16-30/**11**/2022	RT & DLFO	Research team procure and supply vaccines and other consumables to the DLFO office
16-30/**11**/2022	RC & DLFO	RCs return unused vaccines to the DLFO office and collect fresh stock of vaccine and consumables DLFOs mark unused doses of vaccines, and store in cold-chain.
04/**02**/2023	DLFO, RC, OHC& RT	Begin of month 9 vaccination campaign and end of year 3 vaccination activities

XI. Contact information

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