Q & A Session

SAARC rabies webinar summary of participant questions and answers by the speakers/experts, Day 3, 2020/05/20

Note: If further clarifications are required, please directly contact the speakers/experts or refer the relevant publications.

Theme: Developing a National Strategic Plan (NSP) for elimination of dog-mediated human rabies – the foundation for rabies control and elimination

The Key Components in a National Strategic Plan (NSP) for Elimination of Dog-Mediated Human Rabies – Dr Gregorio Torres (g.torres@oie.int)

1. Political will is of paramount importance for a National Strategic Plan (NSP). What needs to follow (and is of at least equal importance) are resources or means of implementation. Could you shed some light on this aspect of NSPs?
   Rabies elimination is competing with many other priorities. To gain sustainable political support and the associated resources it is necessary to demonstrate the cost-effectiveness of the control measures described in the NSP. Countries or donors (investors) will not invest in rabies elimination in a sustainable manner if there is not a solid strategic plan and if we cannot show the feasibility of the elimination. Success drives investment. If resources are limited a good start would be to run a pilot project and use the results of this project as a proof of concept. Rabies elimination is feasible, however, we need to break the cycle of neglect by demonstrating the case and also the capacity to scale up at national level.

Using the SARE towards a customised rabies elimination workplan – Dr Andre Coetzer (andre.coetzer@rabiesalliance.org)

1. Policy implementation of rabies control and elimination plans:

a. How effective will this be when the free-roaming dogs are actually overseen by the local level of governance such as municipalities and ward offices?
Every sector and stakeholder has a role to play in the control and elimination of rabies - including the local-level authorities. As such, in-country Stepwise Approach towards Rabies Elimination (SARE) workshops often have representatives from both national and sub-national sectors, with all of the representatives contributing towards the work plan and its contents. Indeed, in the SARE-derived work plan, each activity gets allocated a "responsible authority" who will be responsible for the administration and completion of the activity. While a work plan for the national-level will most often allocate the activity to the national stakeholder (e.g. Ministry of Agriculture), they will in turn be responsible for the allocation of the activities at the sub-national level. As such, local level activities will still be undertaken by local authorities as they are the designated stakeholders - in turn playing their part in the success of the NSP.

In addition, the SARE and its associated work plan is scalable and can be implemented at a sub-national level (pilot area, regional level, etc). As such, work plans at the local level–that complement the national rabies elimination work plan (and NSP)–can be developed and implemented should the need arise. In those local level work plans, the local authorities will be the responsible authorities who advocate their successes to the national level.

b. The livestock ministry focuses more on farm animals and although rabies is a priority disease in Nepal there is a severe lack of rabies control programs from the government. Welfare organisations are conducting mass vaccination campaigns. How do we analyse this gap?
The SARE tool assesses a country's progress towards rabies control by considering various categories that are often neglected or only partially addressed. By completing a SARE assessment and developing a workplan, a diverse, yet well-rounded work plan is developed – with the vaccination of dog populations and the provision of human post-exposure prophylaxis (PEP) being central to its success. As such, the development of the work plan will place the focus on the importance of dog vaccination and enable the government to designate authorities who will be responsible for the implementation of the required activities.
That being said, welfare organisations do not need to be excluded from contributing to the country's efforts for rabies control as their work at the local level assists the government in completing the work laid out in the workplan. In fact, in our experience many governments use the work plan to direct NGO's and welfare organisations – ensuring that their local level efforts also contribute towards the government's broader objectives.

c. Should a country first develop an NSP, and then use SARE to define a detailed workplan to implement the NSP?
No, the development of a work plan and its implementation is not reliant on an existing NSP. In fact, there is no reason why rabies control should wait for an NSP to be developed as this process could take a considerable amount of time. The SARE assessment and workplan development can take place at any time – enabling rabies control to commence at the local level, while also providing evidence for the feasibility of rabies control. This information (the SARE assessment, workplan, and small scale successes) can later accompany the NSP when it is developed and moving towards governmental endorsement – in turn resulting in additional funding being allocated towards the work plan and its implementation. Similarly, the SARE and work plan can still be used if an NSP has already been developed and endorsed by the relevant stakeholders as this will provide a mechanism whereby the existing NSP can be implemented across all administrative levels.

2. Many dogs have been vaccinated and we have the resources, yet we still talk of challenges to canine rabies – particularly in Asian countries compared to the western world. Where are we missing out? (Do we need to rethink strategies and policies? Is it because of the stray dog population dynamics? Are we compromising on stray dog control strategies? Should we have seroprotection maps in areas of high vaccine cover? Are there intersectoral coordination failures?)

Past experiences from various developed countries have shown that the control and elimination of dog rabies is the only effective way of eliminating human rabies. The elimination of dog rabies relies on the vaccination of a sufficient proportion of the total at-risk dog population with high quality vaccines.

Vaccination campaigns need to focus on both confined and free-roaming dogs in order to be effective. Most countries focus their efforts on owned and/or confined dogs when implementing dog vaccination campaigns – calculating their vaccination coverage based on those dog populations only. While this method produces estimated vaccination coverages that often exceed 70%, the neglect of the free roaming dogs means this number is greatly overestimated. Without the inclusion of the free-roaming dog populations during dog vaccination campaigns, the campaigns will appear ineffective and potentially result in reduced governmental dedication. As such, dog vaccination events should focus on the total dog population, including both confined and free-roaming dogs. Indeed, free-roaming dogs are the most important subpopulation in terms of rabies transmission as they are able to spread the disease within areas due to a lack of confinement. By neglecting those populations, the effectiveness of dog vaccination campaigns will never reach their full potential.

That being said, dog vaccination campaigns can reach all of the target population but if they rely on low quality vaccines may result in inadequate seroconversion. In this case, vaccinated animals might not be protected against rabies and thus still contribute towards its spread in the community. With the use of high quality vaccines, animals will seroconvert when vaccinated and the need for costly seroprotection maps (that take money away from the campaign and its implementation) is negated.

Using the outputs of PVS evaluations, JEE mission reports, and IHR-PVS NBWs for Rabies control and elimination – Dr Maud Carron (m.carron@oie.int)+ Dr Katinka de Balogh (Katinka.DeBalogh@fao.org)

1. How effective is PVS evaluation?

The **Performance of Veterinary Services (PVS) Pathway** is the OIE's flagship capacity building platform for the sustainable improvement of National Veterinary Services (NVS). The PVS Pathway empowers the NVS by providing

them with a comprehensive understanding of their strengths and weaknesses using a globally consistent methodology based on international standards – a useful external perspective that can reveal gaps, inefficiencies and opportunities for innovation. Some key characteristics of the PVS Pathway:

- a broad-based systems approach,
- a voluntary, country driven process,
- a longer term strategic focus (5-10 years),
- a participatory, supportive and collaborative process, rather than being directive or presenting a risk to countries.

The PVS Pathway has proven an unmitigated success since its launch in 2007 and the numbers testify to this, with currently 140 countries actively engaged. During 2017, marking the ten-year anniversary of the PVS Pathway, the OIE convened a PVS Pathway Think Tank Forum involving numerous stakeholders to confirm its successes, take stock of lessons learned and set directions for the future. The Forum affirmed the relevance of the PVS Pathway and existing activities and identified new activities to ensure that countries are more continually engaged in this process, can tailor their engagement based on governance and technical needs, and can more equally benefit from its outputs. More information on the PVS Pathway can be found at: https://www.oie.int/en/solidarity/pvs-pathway/

How can SAARC countries benefit from the proposed OIE Reference Laboratory on Rabies in India? – Dr Shrikrishna Isloor (kisloor@gmail.com)

1. **Laboratory support and activities:**

   a. How do you assist field teams to ship the samples to your laboratory for analysis?

   Initially, we train field vets on 'Packing brain samples in primary, secondary, tertiary containers before submission' the same vide a proforma that we have developed. If they have not undertaken any training, they are instructed by telephone about the procedure of packing and shipping samples. We also share pictures or videos of the packing procedure.

   b. Is there any plan or project to extend rabies activities at the laboratory to wildlife?

   We have been receiving brain samples from wild animals. We reported the first documentation of rabies in wolf based on laboratory tests. We have also trained wildlife veterinarians from the North Eastern part of India during the Regional Training programme conducted at the Veterinary College, Khanapara, Guwahati, Assam. We are interested to take up such training programmes (maybe dedicated for Wildlife veterinarians).

c. Are the diagnostic results from the laboratory shared with the [human] health sector automatically and regularly?
Yes. We have been sharing information with the National Centre for Disease Control (NCDC), Ministry of Health, Government of India. Furthermore, it is also proposed to share the information through the National Animal Disease Reporting system (NADRS).

d. What are you doing to support countries to use alternatives to the mouse inoculation test (MIT)?
MIT is mostly of academic interest.. This approach is not suitable for the routine diagnosis of rabies. As an alternative to this, we can support countries through training programmes on employing the Direct Fluorescent Antibody (DFA) assay and Polymerase Chain Reaction (PCR) for diagnosis of rabies. The preliminary diagnosis may be based on the Lateral Flow Assay (LFA, immunochromatography), which has been found to be user friendly and rapid, based on the experience of field veterinarians who tested thousands of brain samples from animals in India.

e. Does your institute conduct proficiency testing for rabies diagnosis?
So far we have been involved in Interlaboratory comparisons (ILC) for validation of the tests. We will undertake Proficiency Testing in future.

f. Does/will the laboratory use the FAVN or RFFIT technique to test for antibodies to rabies?
Yes. The laboratory uses RFFIT to test for antibodies to rabies.

g. Where is the nearest available RFFIT facility to Pakistan. Is it possible to dispatch animal serum samples from Pakistan for rabies neutralizing antibodies titre detection using RFFIT to a nearby country? If so, what are the protocols?
The nearest available RFFIT facility for Pakistan is the Pasteur Institute of Iran, in Tehran. Yes, it is possible to ship animal serum samples to a nearby country for rabies neutralizing antibodies titre detection using RFFIT. The OIE may be consulted to facilitate the transfer of serum samples, if needed.

2. Samples and analysis for rabies testing:

a. Have you observed any significant correlations between clinical suspicions and the laboratory diagnosis?
We have not done any statistical analysis on this. On average, two thirds of brain samples submitted to the laboratory over the past 7 years for diagnosis of rabies were positive based on DFA.

b. Besides the hippocampus, is there another region of the brain which is more sensitive for establishing diagnosis of viral antigen?

It is preferred to collect cerebellum and brain stem, post mortem, for the detection of rabies viral inclusions by DFA or PCR. It is much easier to collect these samples using the user friendly foramen magnum or occipital foramen method without opening the skull. We primarily focus on training our participants on this simple and rapid method of brain sample collection.

c. If the animal is not available for testing or observation, how can we search for rabid dogs?

Communicate with the local community where the rabies suspected dog/animal was sighted. Prevail upon the local community/field veterinarians for the carcasses of dead animals known/suspected of biting in the nearby locality, and attempt to identify such animals through any bite victims. If found, the brain sample be collected and transported to the nearest rabies diagnostic laboratory for confirmation.

General Questions (Courtesy: Dr Ryan Wallace, euk5@cdc.gov)

1. Species susceptibility:
    a. Why are poultry resistant to rabies?

    There are several reasons why poultry do not get rabies:

    (i) First, rabies virus CAN infect the nerve cells of poultry! There are laboratory experiments where avian species can become infected and die from rabies. There is one report in India of a natural infection of a chicken with rabies from the bite of a rabid dog. The chicken developed a neurologic illness and was confirmed rabid by DFA test. Biologically, avian species CAN get rabies.

    (ii) It's INCREDIBLY RARE. Just like rabies is rare in very small terrestrial mammals, the trauma of bites on small animals and many avian species leads to rapid death from the trauma, before rabies virus can reach the central nervous system.

    b. Rabies generally affects all warm-blooded animals, but what is the reason for difference in susceptibility among warm blooded animals? Is there any reason why foxes and jackals are most susceptible, and dogs are relatively less compared to foxes?

    Like most viruses, host-virus interactions have developed over hundreds, thousands, or even tens of thousands of years. This has led to the differentiation of at least 15 different Lyssaviruses that all cause the disease rabies, and over 30 recognized **variants** of the RABIES VIRUS.

These variants of rabies virus all have minor genetic mutations that make them more adept at circulating in their reservoir species. In general, species that are larger meso-carnivores with canine teeth that live in communal (higher density) populations are more often reservoir species. Three core factors must be considered: host genetics, virus genetics, and ecology. If any of these are unfavorable, the transmission cycle will die out in the population. An interesting paper was just released that discusses some of these issues:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7196766/pdf/pnas.201919176.pdf

Question to Tripartite organisers of the webinar series

1. The third pillar of One Health (environment/ecosystem) was not covered in detail in the presentations and discussions. In a post-COVID-19 era, can we show that rabies and dog control is not just benefitting public and vet health, but also wildlife/biodiversity health and whole ecosystems (thereby attracting additional support from decision-makers, donors and the civil society)?

   The tripartite defines One Health as a collaborative, multidisciplinary and multisectoral approach that can address urgent, ongoing or potential health threats at the human–animal–environment interface at sub-national, national, global and regional levels (https://www.oie.int/fileadmin/Home/eng/Media_Center/docs/EN_TripartiteZoonosesGuide_webversion.pdf).
   Given the role of environment/wildlife/biodiversity in the epidemiology of rabies, the tripartite has always been encouraging countries to use a One Health approach to tackle rabies disease. Success in the control and elimination of rabies in animals will also have positive implications to wildlife and the ecosystem in general. As it is important to understand dog ecology and the role and effect of human-animal-wildlife interaction as determinants for persistence and spread of rabies, the tripartite will try to include topics on the role of wildlife and environment in the future webinars and physical meetings.

Resources

Webinar recordings: https://rr-asia.oie.int/en/events/saarc-rabies-webinar/

See OIE website for more information on PVS evaluation:
https://www.oie.int/en/solidarity/pvs-pathway/

We have a library of Members' action plans against rabies on our regional OIE website: https://rr-asia.oie.int/en/projects/rabies/member-nap/

For the state of play/more information on NBWs, please see: https://extranet.who.int/sph/ihr-pvs-bridging-workshop

WHO revised PEP guidelines are available here: https://www.who.int/rabies/resources/who_wer9316/en/

Differences between reservoir species and 'accidental' rabies hosts: See WHO Expert consultation https://www.who.int/rabies/resources/who_trs_1012/en/

https://www.oie.int/fileadmin/Home/eng/Health_standards/tahc/current/chapitre_aw_stray_dog.pdf