Q & A Session

SAARC rabies webinar summary of participant questions and answers by the speakers/experts, Day 2, 2020/05/19

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

Theme: Multisectoral Coordination Mechanism (MCM) in responding to rabies elimination

Leading from the front, globally – the UAR initiatives – Dr Bernadette Abela Ridder (abelab@who.int), Department of Neglected Tropical Diseases, WHO HQ, Geneva

1. Achieving zero human rabies death by 2030 is going to be a difficult task. What do you foresee about rabies elimination in Asian countries?
   Yes. It will not be easy to achieve zero human deaths for many countries but there are positive developments in Asian countries. Bhutan and Sri Lanka have demonstrated good progress towards rabies elimination. Bangladesh has made remarkable progress in a short period of time. Most countries in south Asia have undergone Stepwise Approach towards Rabies Elimination/Practical Workplan towards Achieving Rabies Elimination (SARE/PWARE) exercise and they know where they are and what needs to be done in the future to move towards rabies elimination. Some of them came up with a National Action Plan for elimination of dog-mediated human rabies. Even in India, a success story of rabies control and subsequent elimination has been generated in Sikkim, Nilgiris, Goa and it should be replicated in other places. Thailand and the Philippines have made remarkable progress towards rabies elimination.
2. Forty percent of human rabies cases fall under the age group of less than 15 years of age, so a strict legislation based on classroom-based education is necessary. Please elaborate on such measures/initiatives.
   Yes, school education is an important part of rabies awareness and education and some countries have developed health education materials designed to educate school children. Others have negotiated with the Ministry of Education to have a chapter on rabies. GARC and some countries have health education materials on websites which can be adapted as per country context and need. We need local champions to advocate for rabies prevention in school education programmes.
3. Post-exposure prophylaxis (PEP):
   a. What is the success rate of PEP using vaccine only in humans, in a post-bite scenario from a confirmed rabid dog?

Most dog bite cases are reported in lower extremities and most of them fall under bite category II; postexposure vaccination is sufficient provided that the bite wound is washed properly, vaccination is started as soon as possible using a human rabies vaccine stored appropriate in a refrigerator before use. If there is a category III bite, application of rabies immunoglobulin is mandatory as vaccination alone may not be sufficient; in these cases, rabies virus may reach the central nervous system before the vaccine can be effective.

b. To help convince policy makers, is there any authentic data on man-days lost/economic losses due to rabies in humans, and deaths including the losses due to PEP protocols?
Yes, several studies have been conducted and published. Managing a rabies exposure, where the average cost of rabies post-exposure prophylaxis (PEP) is currently estimated at an average of USD 108, can be a catastrophic financial burden on affected families whose average daily income may be as low as USD 1–2 per person. The study estimates that globally canine rabies causes approximately 59,000 (95% Confidence Intervals (CIs): 25-159,000) human deaths, over 3.7 million (95% CIs: 1.6-10.4 million) disability-adjusted life years (DALYs) and USD 8.6 billion (95% CIs: 2.9-21.5 billion) economic losses annually[1] .
[1]Estimating the Global Burden of Endemic Canine Rabies. https://journals.plos.org/plosntds/article/file?id=10.1371/journal.pntd.0003709&type=printable

WHO Expert Consultation on Rabies. TRS No. 1012. https://apps.who.int/iris/bitstream/handle/10665/272364/9789241210218-eng.pdf?ua=1

c. PEP is not recommended in food animals, but what about animals suspected to have exposed through a rabid-dog bite?
WHO and OIE do not recommend post-exposure prophylaxis of food animals bitten by a suspected rabid dog. Usually it is a category III bite and anti-rabies serum is not available for animals. So post-bite vaccination provide a false sense of security. Therefore, we have to focus on mass dog vaccination to save the lives of livestock, companion animals and humans.

4. Funding for rabies control:

a. How much of the WHO budget is spent annually on rabies worldwide and in SAARC, specifically in the animal health sector?
WHO is not a funding agency and WHO budget is spent on generating evidence-based information for policy advocacy and providing technical support for proof of concept through pilot project such as Cox's Bazaar

(Bangladesh), Karachi (Pakistan) and National Rabies Control Project (Bhutan). In addition, essential laboratory diagnostic reagents and kits are supplied from time to time. There is no specific WHO budget for the animal health sector but WHO is supporting One Health projects.

b. How can States in India get access to international funding along with state government funding to initiate an eradication program? (OIE dog rabies vaccine bank.
India is supported for pilot projects on rabies control by International NGOs namely, Vets Beyond Borders, Mission Rabies, Humane Society International and World Animal Protection. There is funding of state-level rabies control projects through the National Rabies Control Programme (NRCP) and ASCAD (Union Ministry of Fisheries, Animal Husbandry and Dairying). As far as access to the OIE dog vaccine bank is concerned, a request should be made through the OIE Delegate (in the Union Ministry).

c. A question for country representatives: Is there any instance of a rabies elimination program that is nationally owned and resourced? Will the global financing facility help national efforts to eliminate rabies?
Bangladesh, Bhutan, India and Sri Lanka have national programmes in place which are funded by the national governments, but pilot projects in these countries are supported by international NGOs and sometimes by FAO, OIE or WHO.

Experiences from Africa including how cross-border issues are being tackled – Dr Tenzin Tenzin (t.tenzin@oie.int), Rabies Project Coordinator, OIE-Sub Regional Representation for Southern Africa, Botswana

1. It was interesting to know dogs and cats were vaccinated as a part of MDV in Namibia? What was the reason behind it and what is the significance of rabies in cats?
Namibia, or Africa in general, focus on mass dog vaccination since dogs are the main reservoir and vector for rabies transmission. However, cats are also vaccinated when the owners present them for vaccination at the vaccination points. The proportion of vaccinated cats is only around 8%. Cat bites/scratches in humans and rabies incidences in cats are also reported in Namibia with around 62% positivity rate. Cats are not an important reservoir of rabies in Namibia. You can get further details from this publication: https://doi.org/10.1371/journal.pntd.0007355

2. Funding:
    a. We are working on One Health with the main goal to eliminate rabies. Besides dog vaccination and effective surveillance and reporting

systems which we have in place, can we access funds specifically for research/implementation of oral bait vaccination which would be much easier especially in countries like India where multiple sectors are involved for canine control and care?

Mass dog vaccination is cost-effective to control dog-mediated rabies, but oral rabies vaccination may complement the parenteral vaccination in dogs to increase vaccination coverage. Many ORV trials have been conducted in different canine rabies-endemic regions around the world and over the years; the safety margin of the bait has greatly improved. You can see the paper below which is related to ORV in Goa, India. The paper is available online for download:
(https://www.sciencedirect.com/science/article/pii/S2590136219300166).

3. Millions of dogs are vaccinated globally in mass dog vaccination campaigns.
    a. Do repeat vaccinations really benefit?
    b. Are there any adverse effects from vaccines?
    c. What is the bite rate [from rabid dogs]?
    d. Is there any information on provoked versus unprovoked bites?

The basic reproductive number for rabies (R0) is very low, ranging from 1.2 to below 2 – meaning that one rabid dog will transmit rabies to 1.2 to 2 other dogs in a susceptible population. Therefore, the critical threshold (1-1/R0) required to vaccinate the dog population based on the R0 is around 20-50%; this means that a vaccination coverage of around 50% will be sufficient to eliminate rabies/prevent transmission among dogs. But there will be rapid turnover of dog population due to birth of puppies that adds to the susceptible population, deaths of vaccinated dogs, emigration of vaccinated dogs into others areas, immigration of non-vaccinated dogs from other areas, and natural waning of immunity over the years – all of these ultimately result in loss of herd immunity in the population. To account for this, a minimum of 70% vaccination coverage annually for 5 years is required to interrupt the transmission chain among and between dogs to eliminate rabies.

Most rabies vaccines are tissue culture vaccines that are safe and do not cause any side effect in dogs. Human hospitals should maintain data on provoked versus unprovoked bites to make an informed decision of PEP administration. You can get more information about the vaccination requirement in the following papers:
https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.1000053

https://pubmed.ncbi.nlm.nih.gov/17452645/;
https://pubmed.ncbi.nlm.nih.gov/19706492/

4. How do you address cooperation within local government units to prioritise rabies elimination campaign at the policy level?
   We organize meetings among the relevant stakeholders, present rabies incidence data in animals and humans, propose and prepare action plans for control activities, implement the plans and demonstrate success to the stakeholders to get their support.

5. Rabies "outbreaks":
   a. Please outline how rabies can be termed as an "outbreak".
      It depends on the country's national plan on how to categorize the outbreak. If there are cluster of cases being reported in dogs/other animals, then it can be considered as an outbreak. Even if one case is detected, it can also be considered as an outbreak because there will be unreported cases in the population/area due to poor surveillance.
   b. Do cases of canine rabies occur as outbreaks with temporal or spatial clustering?
      Yes, rabies outbreaks can cluster by time and space. Suppose a rabid dog has bitten some other susceptible dogs in the area and those infected dogs will show symptoms after 3 weeks of incubation period. So, there will be cluster of cases detected after 3 weeks in the area. Again, these infected dogs will infect other susceptible dogs and there will be exponential growth of cases if control measures are not implemented in time. Moreover, there will also be cases in livestock following rabid dog bite due to spill over transmission.
      See the OIE definition of Case and Outbreak for animal diseases at https://www.oie.int/index.php?id=169&L=0&htmfile=glossaire.htm#terme_cas

SAARC country updates on the rabies situation, key progress and challenges since July 2019 – Dr Pasang Tshering (p.tshering@oie.int), Consultant, OIE Regional Representation for Asia and the Pacific

1. Control of stray dog populations:
   a. Is control of a stray dog population a measure for controlling rabies where mass dog vaccination is not possible/feasible?
      Controlling the stray dog population alone is not sufficient unless rabies vaccination is also carried out. Mass dog vaccination is critical to eliminate rabies as it is equal to depopulation, i.e. no more susceptible population to maintain dog-to-dog rabies transmission (good herd immunity requires more than 70% dog vaccination coverage). The Pan American Health Organization (PAHO) has eliminated dog-mediated human rabies through mass dog vaccination and active rabies

surveillance. In some countries in Asia, dogs that are caught for animal birth control using the capture, neuter, vaccinate and release method (CNVR), are also vaccinated against rabies thus the CNVR can also potentially contribute in achieving population stability and good vaccination coverage.

b. Is there any justification for culling/killing stray dogs?
There is no justification for culling/killing stray dogs as it will create a vacuum for intrusion of dogs from other areas. Secondly, inhumane methods of killing dogs (use of gas chamber, strychnine sulphate or shooting) are socially unacceptable. There should be planned systematic activities for animal birth control with community engagement and CNVR has given best result in Asian countries.

2. Is the definition of "outbreaks" for rabies across countries in South Asia similar? What is the definition? Or does the presentation refer to individual rabies cases?
Outbreaks may be a single or more cases depending on the surveillance system and epizootiological situation of the country. Since all countries have to report rabies outbreaks to the OIE, the same definition should be used by reporting countries (Please see response from Tenzin in Q5 above).

3. Are the bars relating to funding on the graph based on funding from the government or also from the external sources? To my knowledge, there is funding for an animal rabies control program from external funding agencies.

The information is based on responses from SAARC countries to a questionnaire survey. Most countries have funding of animal rabies control programmes from the national or provincial or local government (like Sri Lanka, Bangladesh and Bhutan) but some countries have support from NGOs and INGOs (like Afghanistan, and Nepal) as government funding is not sufficient or dog rabies control is not a priority. World Veterinary Services, World Animal Protection, Humane Society International and Vets Beyond Borders are major INGOs working in several countries.

How Bhutan is using MCM to mount rapid response (s) to outbreaks/cases of rabies in animals – Dr Karma Rinzin (rinzink@gmail.com)

1. Bhutan is promoting integrated bite case management (IBCM), what are the challenges when HH and AH sectors have established system in place?
There is a good information sharing mechanism between animal and human health authorities. When dog bite cases are reported to human health facilities, they immediately share details with animal health counterparts. Similarly, when rabies cases in animals are reported to animal health facilities, they

immediately share details with the human health counterparts before an investigation is carried out jointly using a One Health approach.

Bhutan identified focal officers from the Animal Health and Human Health Authorities who will take the lead in implementation of IBCM in Bhutan.

2. Rabies control program in Bhutan:
    a. Please explain the dog population management programmes [in Bhutan].
    As part of dog population management programmes, the following activities are carried out:
        i. Mass animal birth control or capture-neuter-vaccinate-release program (CNVR) of free-roaming dogs.
        ii. Promote community engagement through education to change human behaviour.
        iii. Promote responsible dog ownership.
        iv. Promote habitat control.

    b. In Bhutan, who is responsible to report that there is a rabid dog and what happens after?
        i. In accordance with Livestock Act of Bhutan 2001, any person who sees a dog with suspected rabies signs should immediately report to the nearest animal health centre or the Bhutan Agriculture and Food Regulatory Authority.
        ii. Upon receiving the report of suspected rabies cases, animal health and human health authorities carry out a joint investigation through the One Health approach.
        iii. If rabies is confirmed, a Rapid Response Team is activated who will then implement disease control measures which include: case management, providing booster vaccination of vaccinated dogs and cats, enforcing movement control and providing post bite prophylaxis of people who were exposed to suspected rabies cases (including animal health workers).

    c. What is the role of local NGOs in rabies control?
    Roles of local NGOS in rabies control in Bhutan are:
        i. Advocacy and awareness programs in schools and communities.
        ii. Assisting the animal health authorities during mass dog vaccination campaigns.

iii. Assist animal health authorities during the implementation of capture-neuter-vaccinate-release programmes in catching and releasing dogs, and providing pre- and post-operative care etc.

d. In Bhutan's experience, what are the drivers or opportunities that encourage a One Health approach to be adopted for governance and policy?
    i. Strong support of the policy makers.
    ii. Good network and collaboration between human and animal health authorities.
    iii. Competent and committed technical team with good knowledge in epidemiology and the One Health programme.

    With such committed teams at all levels, the Bhutan One Health Strategic Plan was endorsed by the Government, with formally instituted Inter-ministerial Committee for One Health, National One Health Technical Committee, and District One Health Committee; Bhutan is currently pursuing to establish a permanent One Health Secretariat.

3. What different mobile applications are currently being used for mass dog vaccination in different countries?
    a. In Bhutan we are using MDV Apps developed by Humane Society International. Currently this App works on only Android phones. HSI is working to make it compatible with IOS phone as well.
    b. This App also has features to carry out a post vaccination survey which enables estimation of the vaccination coverage.
4. In your diagnostic case studies of canine rabies cases:
    a. Was this based on clinical suspicion or was it based on post-mortem examination of brain samples?
    Rabies in animals in Bhutan is usually diagnosed at the field level using a rapid test (lateral flow assay) after the brain of the suspected animal is autopsied and samples are taken. If the test result is positive, then a rapid response is activated immediately, and information is shared with the human health officials in the area. If the rapid test result is negative but if there is strong suspicion of rabies (based on history, clinical signs and rabies endemicity of the area), then samples are immediately referred to the National Veterinary Laboratory (NVL) for further testing using the Direct Fluorescent Antibody (DFA) Test. In any case, regardless of the outcome of the rapid test results, the current protocol requires sending brain samples from all clinically suspected cases originating from rabies-endemic areas to the NVL for laboratory confirmation using the DFA test and for archiving of samples for molecular analysis.

Readers may refer to this peer-reviewed paper "Evaluation of a rapid immunochromatographic test kit to the gold standard flourescent antibody test for diagnosis of rabies in animals in Bhutan". BMC Veterinary Research 2020 (DOI: 10.1186/s12917-020-02405-4) via this link: https://www.researchsquare.com/article/rs-10027/v3

b. Was there any correlation between clinical suspicion of canine rabies cases and the post-mortem confirmation?
Post-mortem, by itself, is not a diagnostic tool for rabies in Bhutan. Post-mortem is only done to collect brain samples for laboratory testing. No formal studies have been done to evaluate agreement between clinical suspicion and laboratory test results in Bhutan.

Resources

PDF files for webinar series: https://rr-asia.oie.int/en/events/saarc-rabies-webinar/

Taking a multisectoral, one health approach: a tripartite guide to addressing zoonotic diseases in countries - https://apps.who.int/iris/handle/10665/325620

Register any World Rabies Day events at: https://rabiesalliance.org/world-rabies-day/register

Example of the Philippines where rabies education has become part of the curriculum in all school across the country. https://rabiesalliance.org/news/integrating-rabies-education-philippines-national-curriculum-will-reach-21-million-students

https://endrabiesnow.org

There is the rabies burden study for rabies-endemic countries:
https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0003709

The integrated dog bite case management (IBCM) first developed in Bali, Indonesia has enhanced collaboration between animal and human health sectors for more efficient rabies prevention.
https://www.frontiersin.org/articles/10.3389/fpubh.2020.00013/full

The GARC Education Platform has a growing series of free online courses to provide knowledge and training to engaged community members and rabies professionals, including community educators (Rabies Educator Certificate), animal vaccinators (Animal Handling and Vaccination Certificate), community coordinators (Community Coordinator for Rabies Certificate) and human health professionals (Rabies Healthcare Certificate). https://rabiesalliance.org/capacity-building/gep

See more about the regional rabies networks (such as PARACON) here: https://rabiesalliance.org/networks#regional-networks

Standards for diagnostic tests and vaccines are described in the OIE Terrestrial Manual. https://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_rabies.htm

See here the OIE definition of outbreak: https://www.oie.int/index.php?id=169&L=0&htmfile=glossaire.htm

See here the OIE Code Chapter 8.14 on Infection with rabies virus, where you can find the rabies case definition: https://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_rabies.htm

Here you will find the OIE Chapter 7.7. STRAY DOG POPULATION CONTROL, with OIE recommendations for dog population management. This Chapter is currently being reviewed by an OIE ad hoc Group. https://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_aw_stray_dog.htm

Action plans against rabies for some countries have been collated into a library on the regional OIE website: https://rr-asia.oie.int/en/projects/rabies/member-nap/

Visit the OIE Rabies Portal here: https://www.oie.int/en/animal-health-in-the-world/rabies-portal/

Here is a link to information about the GARC App and the custom-device that has been designed to help track MDV. https://rabiesalliance.org/capacity-building/reb

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