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Expert's view

#3 – SEPTEMBER 2021



HUB_VPH

Lyon Veterinary Public Health Initiative

World Rabies Day: Why do nearly 60,000 people still die from a 100% preventable disease each year?

On the occasion of the 15th World Rabies Day, which takes place every year on 28 September, Dr Guillaume Convert, Technical Director for Rabies at the VPH Center (Veterinary Public Health) at Boehringer Ingelheim, explains to us how the implementation of a concrete One Health strategy in the field could make it possible to eliminate rabies and restore the link between humans and dogs.

Why can't rabies be eradicated?

Rabies will never be eradicated from the wild, but rabies in humans can be eliminated if we prevent its expression to humans. This human health objective is the first pillar of a One Health approach such as "Zero by 30" are all about. This means setting up sustainable programmes to treat exposed humans and prevent its transmission in countries where rabies still kills – mainly in Asia and Africa. Programmes in which the vaccination is central but should not be considered as the only answer: the prevention component must be much broader and respond to the now well-known One Health approach.

How can this One Health approach be applied in practice in rabies control programmes?

Rabies control is a typical example of a situation in which a sustainable and virtuous One Health circle can be created. First of all, we need to raise awareness among the population, starting with dog owners because more than 95% of human rabies cases are transmitted by dog bites. For example in Vietnam, it is estimated that out of 7 million dogs, 5.5 are declared as pets but only 4 million are vaccinated! So we have 1.5 million domestic unvaccinated dogs which are not considered a danger. 40% of people who die of rabies did not seek post-exposure treatment (which is free in Vietnam) because they knew the dog and did not imagine they could be infected.

From an economic point of view, the benefits of prevention are out of all proportion compared to the cost of treatment:

the medication needed for post-exposure treatment of a bitten person costs on average \$100, while the cost of vaccinating a dog against rabies is \$3 (including 30 cents for vaccine). At a rate of one dog per 10 inhabitants, in theory prevention would only cost 30 cents per year per inhabitant.

In many rabies-endemic countries, if all domestic dogs (fed daily and voluntarily by humans, even if often left to roam free) were vaccinated, a vaccination rate close to 70% would often be achieved, eliminating transmission of the virus to human. Much attention is often given to 'stray' dogs which are afraid of humans and are difficult to vaccinate; but it is the vaccination of the so-called domestic dog which should be routinely prioritized.

Mind-sets need to change to favour the vaccination of dogs. This animal health aspect is the second pillar of One Health.

Isn't it the responsibility of the State to set up these campaigns?

Indeed the State does play a major role in providing cost-free vaccines, but vaccination against rabies cannot only be a Government concern.

The challenge is to bring the dog to this vaccination, and it is indeed the educational component that allows this to happen. This is an economically viable prospect as it reduces the global cost of rabies for the State; however it is also important from a societal point of view as it makes people responsible and develops the human-animal bond.

What does this change from the point of view of the human-animal bond?

Animals - especially dogs, can be either dangerous or protective according to how they are approached. In rabies endemic countries, dogs are at the crossroads of the wildlife rabies reservoir and of humans. Naturally, he is the rabies vector to humans, vaccinated he becomes a fence. Humans (adults) behave warily and even aggressively towards dogs because they are afraid of this vector animal.

Within the framework of the United Against Rabies Forum (a tripartite initiative led by FAO, OIE and WHO) we are trying to measure the impact of the improved human-animal relationship for rabies control. This is a spin-off from vaccination campaigns conducted in Pakistan and Egypt which seem to have had an impact on the incidence of dog bites. Dogs were fitted with collars showing that they had been vaccinated. In Karachi, while 60% of people are normally aggressive towards dogs (shouting or throwing stones at them to keep them away for fear of catching rabies), when dogs are wearing collars indicating their "vaccinated dog" status, 90% of these people behave neutrally or positively towards them.

"It is through the dog that we can protect humans"

The collar changes the perception that humans have of the dog, it influences their behavior, which is more positive,

and therefore the dog's behavior, which has no reason to fear or bite someone. It is necessary to measure the decrease in the number of rabies cases but also the decrease in the number of bites, which allows to evaluate the decrease in the use of post-exposure treatments (relatively expensive for the countries). All these savings can then be reinjected into the prevention component through dog vaccination, in our logic of One Health virtuous circle.

What about the environmental aspect of all this?

This is the third and final pillar of One Health. And it is fundamental in the fight against rabies. Some countries are defeatist about rabies control because of stray dogs (those not fed daily and voluntarily by humans) that cannot be easily caught. But in reality, even if they exist, truly "wild" stray dog populations remain relatively small.

Environmental health and particularly waste management is a lever on which action is needed more than ever. Education, sorting, collection and waste management policies, including rendering, must be integrated into rabies control plans. Food waste attracts or even allows the proliferation of stray dogs in some places.

What are the levers of improvement available to improve rabies control?

Helping countries to be more efficient in their vaccination efforts! the cost of a dose of vaccine for a dog is 30 cents, but the cost of vaccination varies from \$2 to \$20 depending on the involvement of the population and their ability (willingness) to bring the dogs to the vaccinators – it is in the improvement of this aspect that we must act first.

GAVI (Global Alliance for Vaccines and Immunization) is creating a virtuous pharmaco-economic model by promoting prevention, ie: facilitating access to post-exposure treatment in countries that implement prevention through dog vaccination against rabies.

And of course, as a vaccine producer, our role is to ensure that quality vaccines are supplied effectively according to the needs to be used from the youngest age of the dog and, if possible with some thermo-tolerance characteristics.



About the VPH HUB

Created in January 2020, the VPH HUB (Veterinary Public Health) is a unique public-private initiative driven by 10 major players in the healthcare ecosystem in the Auvergne-Rhône-Alpes region*, with the aim of making Lyon a world reference center in veterinary public health, whether in terms of research, training or economic development.

* *Founding partners: Aderly, Auvergne-Rhône-Alpes Entreprises, BIOASTER, Boehringer Ingelheim, Institut Mérieux, Lyonbiopole, Métropole de Lyon, Auvergne-Rhône-Alpes Region, University of Lyon and VetAgro Sup. Associated partners: INRAE, ANSES.*

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