

Working with dogs in India is the only way to tackle one of the most fatal diseases in the world

To mark the 17th World Rabies Day on September 28th, the authors discuss their research findings and explore the implications of strategies aimed at eliminating this life-threatening disease in India.

Rabies: a fatal disease

Rabies is the only disease in the world with a 100% fatality rate.

Despite being one of the oldest known diseases, it still has no cure, and prevention is the only way to control its spread.

[59,000 people](#) die of rabies every year, with over a third of these deaths occurring in India, a country with a huge stray dog population, [where rabies is endemic](#) in both humans and dogs. People typically get rabies when they are bitten by an infected animal – in over 99% of cases, when bitten by an infected dog. Rabies infection tends to occur in already marginalised, poor and vulnerable populations and is particularly prevalent in children. Low-income communities are, in fact, both more likely to live in close proximity to infected stray dogs as well as least likely to have access to treatment. In addition to the human suffering caused by rabies, huge numbers of dogs and livestock also die from the disease.

Standard treatment for people exposed to rabies

After exposure to rabies, there is only a short window of time during which treatment can be delivered to stop the infection. The treatment requires vaccination of the exposed person, a process known as Post-Exposure Prophylaxis (PEP). This is often combined with an injection of ready-made antibodies (rabies immunoglobulin) to support the body before it produces its own antibodies in response to the vaccine. This treatment is costly and not easily accessible, particularly in remote rural areas and indigenous communities. Those who do not get treated in time suffer from [terrible symptoms](#) that culminate in

death.

It is also possible to be vaccinated against rabies before exposure – a process known as Pre-Exposure Prophylaxis (PreP). PreP reduces the doses of post-exposure prophylaxis required in case of exposure and eliminates the need for rabies immunoglobulin. In low- and middle-income countries, PreP is primarily administered among people at very high risk of contracting rabies, such as those working very closely with potentially infected animals. This has prompted [discussion](#) about expanding the use of PreP to other high-risk groups in LMICs, such as young children and people living in areas where [animal bites are common](#).

The One Health Approach to Tackling Rabies

Recently, the global approach to tackling rabies has shifted from seeing dogs as a public health threat to seeing them as companions with whom we need to work to eliminate rabies. This holistic approach that embraces the idea of jointly protecting and improving the health of humans, animals and the ecosystem is known as [One Health](#).

In the case of rabies, following the One Health approach involves vaccinating both dogs and humans. This significantly lowers the costs of health interventions, as around [50 dogs](#) can be vaccinated at the same cost as vaccinating one human. By implementing [mass dog vaccination](#), dogs can, therefore, be protected from getting rabies, thereby eliminating the reservoir of the disease and the potential of transmitting rabies to humans. Research shows that [vaccinating 70% of dogs](#) against rabies would be sufficient to eliminate the disease altogether.

Rabies surveillance can also be enhanced as part of the One Health strategy by using [Integrated Bite Case Management](#). This entails close coordination between animal health and human health professionals to assess the risk of contracting rabies following a bite, determine whether rabies treatment is required and stop the infected animal from spreading the disease further. Integrated coordination reduces the need for expensive post-exposure treatment in humans when it is not considered to be required and the spread of rabies from infected animals.

The One Health approach to tackling rabies is, therefore, also very [cost-effective](#). Given

all its benefits, the WHO has committed to adopting this approach to [eliminate rabies in humans by 2030](#) and has set the theme for the upcoming [World Rabies Day](#) on the 28th of September as “All for one – One Health for all”.

Eliminating rabies in India by 2030 using the One Health approach

In line with the WHO commitment, India, where over a third of all deaths from rabies occur, has [reiterated its commitment](#) to eliminate all deaths due to dog-mediated rabies by 2030 through sustained mass dog vaccination and the delivery of appropriate post-exposure treatment.

However, the [One Health strategy that is currently being implemented in India](#) could be enhanced in various ways. Integrated Bite Case Management with animal professionals and changes related to shifting from a month long to a [one-week regimen of PEP](#), both of which would make PEP use more efficient and effective, should be adopted. As [42% of dogs in India are strays](#), the Indian government must also consider using more costly [oral vaccines](#), as has been successfully [demonstrated in Thailand](#), alongside standard mass dog vaccination to reach this stray dog population. The increased cost of oral vaccines will be offset by the shorter time required to achieve higher vaccine coverage rates in the dog population and hence allow the country to reap the benefits of vaccination (lives saved as well as cost saving from rabies treatments avoided) faster making it a [cost-effective](#) alternative to the standard mass dog vaccination strategy. Vaccinating puppies and dams (pregnant dogs) should also be considered since rabies transmission is also reported through [puppy bites](#), and vaccinating puppies is [cost-effective](#). Vaccinating individuals at high risk of contracting rabies prior to exposure ([Pre-Exposure Prophylaxis](#)) could also be carefully considered as a possible part of the rabies elimination strategy. Additionally, environmental measures like [waste management](#), which is a major concern in India, also need to be examined through a One Health lens in terms of its impact in proliferating the stray dog population.

A genuine commitment to the One Health approach also requires the integration of several government departments including the Health, Animal Husbandry and Forestry departments. This can be most effectively achieved in the Indian context at the level of the powerful local government.

The One Health approach for health equity

The victims of animal bites in India are most often people belonging to lower socio-economic groups, vulnerable populations, children, tribal people and people living in inaccessible hilly and forest areas. Access to and [awareness](#) of the need for PEP and PreP is low amongst both health professions and the public in these groups. This lack of access and awareness impedes PEP uptake in these most affected groups. For this reason, implementing a One Health approach to tackle rabies would also improve health equity in the Indian context. One Health interventions also address health equity in a broader sense by refocusing rabies prevention efforts to include dogs rather than just humans and guarantee their wellbeing.

A promising pathway forward

While being among the countries most severely hit by rabies, India also has some feathers in its cap to fight the spread of this disease while, at the same time, promoting health equity through the One Health approach. The flagship program by Mission Rabies, for example, was able to [eliminate rabies from the state of Goa](#) using an integrated One Health intervention. Moreover, in 2017, India became the first country to license a [monoclonal antibody for post-exposure prophylaxis](#). Building on this progress, India has the potential to lead the way in implementing a cost-effective, comprehensive and equitable One Health Program for Rabies Elimination. The necessary political will, with sustained commitment and collaboration between all stakeholders, is critical to success.

Embracing a One Health approach is the most promising and realistic pathway to promote the health of humans, animals and the planet.

It is “[for all](#)” and perhaps the only realistic path to finally eliminate the terrible and fatal disease of rabies.

Photo by N. Gowthaman. World Rabies Day 2023: All for 1, One Health for all!