

Rabies vaccine effective even after warm storage

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Felix Lankester, left, WSU clinical assistant professor, takes a blood sample to test whether a rabies vaccine stored at warmer temperatures is effective against the disease. Credit: Washington State University

A Washington State University-led research team determined rabies vaccines stored at warmer temperatures still protect against the disease in dogs.

The work, published in the journal *Vaccine*, could lead to improved vaccination coverage in hard to reach, rural areas in Africa and Asia where electricity for cooling is limited.

"Thermotolerant vaccines were a really important feature of the campaign to eliminate smallpox," said Felix Lankester, lead author and clinical assistant professor in the WSU Paul G. Allen School for Global Animal Health. "We hope it will have the same effect for eradicating [rabies](#)."

Recommendations by the World Health Organization are for vaccines to be transported and stored in a "cold chain" at between 2°C (35.6°F) and 8°C (46.4°F). Lankester and his colleagues found that Nobivac, a commonly used rabies vaccine, produces the same level of protective antibodies in dogs after being stored for six months at 25°C (77°F) and for three months at 30°C (86°F).

"The ability to distribute vaccines widely outside the cold chain will allow for more consistent coverage across communities," said Lankester. "It could be a quantum shift in how vaccines are delivered."

Eradicating one of the deadliest diseases

"Human rabies from dog bites has the highest fatality rate of any human infectious disease," said Guy Palmer, WSU's senior director of global health. "But rabies is easily preventable with regular dog vaccinations.

Each year roughly 60,000 people, mostly children, die from rabies. Globally, more than 99 percent of [human rabies](#) deaths are caused by

dog bites—almost all in sub-Saharan Africa and Asia.

Millions of people are saved by costly post-exposure prophylaxis - a series of post-bite vaccinations, the first of which must be administered within the first 24 hours after a person is bitten by a rabid dog. But once symptoms appear, the disease is fatal.

Vaccinating 70 percent of the dog population will protect humans and wildlife, such as endangered African wild dogs, from the disease.

WSU, in collaboration with the Serengeti Health Initiative, has been working to control rabies in areas of northern Tanzania through annual mass dog rabies vaccination campaigns. But rabies continues to be prevalent, in part because of the challenges of transporting vaccines to remote areas where vulnerable people live in resource-poor communities.

"If a team-led vaccination campaign misses a village because it is very far or because rain washed out a bridge, then there will be pockets where vaccination coverage is low," said Lankester. "With a community-led initiative, we are hopeful we would improve the coverage levels."

Empowering communities to lead vaccination programs

Mass vaccination teams generally only visit communities once a year, if they can get there at all. When new dogs are born or move into the community, the level of protection against rabies drops. In community-led programs, thermotolerant vaccines could be stored in the community where local coordinators would vaccinate the entire dog population.

"Through community-led programs, coverage could be kept relatively

consistently high, which would reduce the likelihood of rabies returning to a community," said Lankester. "These findings also give confidence to those working to control rabies that if vaccines are kept outside of the cold chain for a small time, they don't have to be thrown away."

In the next phase of the research, Lankester and his colleagues will test the effectiveness of using low-tech cooling options for storing rabies vaccines in rural communities.

More information: Felix J. Lankester et al, Thermotolerance of an inactivated rabies vaccine for dogs, *Vaccine* (2016). [DOI: 10.1016/j.vaccine.2016.10.015](https://doi.org/10.1016/j.vaccine.2016.10.015)

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