Postpandemic rabies surveillance?

I thank our colleagues at the CDC, the USDA, and in Canada and Mexico, for their thorough 2021 surveillance report on rabies.1 There were multiple items of interest in the article about this historical disease of nature, including the first apparent vaccine hesitancy human fatality from rabies, report of the unprecedented Minnesota human postexposure prophylaxis failure, and continued decline in animal surveillance specimens, apparently in the wake of the COVID-19 pandemic. As such, are efforts underway today to increase public outreach to minimize viral exposures, enhance professional submission of relevant brain tissue samples to diagnostic laboratories, and improve adherence to current Advisory Committee on Immunization Practices prophylaxis guidelines? Are supplies of commercial conjugates adequate for continued use in the direct fluorescent antibody test? Is there a reasonable expectation of additional molecular testing options locally for both primary diagnosis and viral characterization in the near future? Similarly, on the topic of wildlife rabies management of raccoons by oral vaccination, no further spread from the eastern focus appeared and containment suffices even postpandemic. However, elimination is mentioned, but has a target date been selected as of yet to meet this national goal for raccoon rabies? Significantly, in Mexico, no cases of human or canine rabies were reported in 2021, and the WHO recognizes the continued success of their substantial program in the elimination of the dog rabies virus variant (RVV). Along these same lines, Canada was reported free historically of canine-mediated RVV and the US self-declared in 2007. Nevertheless, the statement was made that “... dog-mediated RVVs ... are nearly eliminated from North America.”2 In addition, in 2021 over a million vaccine-laden baits were distributed in Texas along the US-Mexico border “… to prevent the reintroduction of the canine-coyote RVV into the US,” without any evidence of the existence of this RVV. I (and I trust, some other readers of JAVMA) would appreciate if the authors would be so kind as to please try to clarify these somewhat conflicting statements in this otherwise lucid communication.

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The authors respond:

The authors thank Dr. Charles Rupprecht for his comments regarding our 2021 rabies surveillance report.1 In 2021, we noted the continuation of a decline in the number of rabies samples tested that began in 2020. In an effort to improve post-COVID rabies surveillance, the CDC’s Pox- virus and Rabies Branch provided $340,000 to state public health partners to improve laboratory-based surveillance capacity through necessary equipment upgrades, procurement of critical supplies and reagents for diagnosis and typing, and training of laboratory diagnosticians on current and new methodologies. Two commercial sources of rabies conjugate (Fujirebio and MilliporeSigma) are producing sufficient conjugate for continued use in the direct fluorescent antibody test. Although there were recent supply shortages, these have been resolved as of August 2023 with the release of the new MilliporeSigma product line (conjugates and accessory products). There is also a highly sensitive and specific real-time reverse transcription–PCR assay (LN34; CDC), which was recognized by the Council of State and Territorial Epidemiologists as a reportable test as of 2022. This test can be performed locally as a stand-alone test for primary diagnosis or in combination with direct fluorescent antibody as a confirmatory test. In addition, there are molecular methods for rapid sequencing for viral characterization, as well as methods for more in-depth analysis of whole genes or genome that can be performed locally. In the future, primary diagnosis may include rapid antigen detection tests, which are currently under evaluation.

The elimination of the canine rabies virus variant (RVV) in dogs, and its frequent spillover into wildlife in the US, required more than $1 billion over 80 years. This extraordinary achievement underscores zoonotic disease management success with sustained public support and one-health collaborations. Prevention, control, and elimination of RVV in free-ranging wildlife populations requires continued collaboration among government and nongovernment partners to maintain and refine a maturing program faced with different opportunities and challenges. Successful rabies management in wild carnivores has been improved through adaptive management and applied research, allowing program managers to act despite uncertainty. The recently completed US National Plan for Wildlife Rabies Management (2023 to 2027), involving more than 100 subject matter experts from 51 agencies and organizations, provides a framework for wildlife rabies prevention and control in the US. The plan identifies 5 key focus areas to address the myriad of ecological, logistical, political, and administrative complexities...
associated with managing wildlife rabies: coordination and communication, rabies surveillance, oral rabies vaccination (ORV) management, ORV monitoring, and research. This plan and the North American Rabies Management Plan provide a general road map for meeting the ambitious goal of being “raccoon rabies free by 2063” in North America through strategic movement of ORV zones after local elimination of raccoon RVV. Elimination is possible from a scientific, practical, and operational sense but, like other vaccine-preventable diseases, will take long-term and sustained commitment of resources.

The Texas Department of State Health Services, in collaboration with the USDA and others, annually distributes approximately 1 million ORV baits along the Texas-Mexico border to prevent reintroduction of the domestic-dog coyote RVV in wildlife from Mexico into the US and prevent spread of Arizona gray fox RVV from Mexico and New Mexico. Continued commitment to prevent a costly introduction or reintroduction of RVVs is warranted given ongoing difficulties of safely and efficiently conducting necessary rabies surveillance along the shared border. Modeling to further understand economic impacts, identify risk corridors, identify surveillance gaps, and conduct a more comprehensive evaluation of current and novel ORV baiting strategies should be considered. Measured caution is in order, and it remains critical that we not get ahead of the science, surveillance, or available resources and that we develop practical operational approaches should a reintroduction occur.

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