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Towards the veterinary diagnostics of the future

Main topic :

The Role of Veterinary Diagnostic Laboratories in Disease Diagnosis and Surveillance in the US, an Application of One Health Initiative

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The convergence of people, animals, and our environment has created a new dynamic in which the health of each group is inextricably interconnected. Therefore, the health of people is closely connected to the health of animals and our shared environment. Approximately 60% of human infectious diseases are due to multi-host pathogens that have crossed the species barrier from animals to humans (zoonotic diseases). And over the last three decades, approximately 75% of new emerging human infectious diseases have been zoonotic. Our increasing interdependence with animals and their products, as well as the close interactions with them (companion and pet animals), maybe the single most critical risk factor to our health and well-being with regard to infectious diseases. As clinical practitioners, epidemiologists, diagnosticians, educators, and ecological experts, veterinarians are essential to advancing One Health mission and protecting the health and safety of animals, people, and the environment. Today, veterinarians and veterinary laboratory diagnosticians play a vital role in the collaborative effort of multiple disciplines working locally, nationally, and globally to attain optimal health for people, animals, and the environment. Surveillance and diagnosis of endemic, emerging, and reemerging diseases of animals and humans are paramount for treatment, vaccination, and implementation of control programs to prevent the spread of human and animal diseases, not only transmitted by animals but also by arthropod vectors (i.e., mosquitos and ticks). In 2002, the US Department of Agriculture established the National Animal Health Laboratory Network (NAHLN), which is a cooperative effort between two USDA agencies—the Animal and Plant Health Inspection Service (APHIS) and the National Institute of Food and Agriculture (NIFA) and with the American Association of Veterinary Laboratory Diagnosticians (AAVLD). The NAHLN is a nationally coordinated network and partnership of Federal (e.g., National Veterinary Services Laboratories [NVSL], State Organizations (e.g., Department of Agriculture, Department of Wildlife and Fisheries, etc.), and state/university associated AAVLD accredited animal disease diagnostic laboratories. NAHLN network laboratories provide animal health diagnostic testing, methods of research and development, and expertise for education and extension to detect biological threats to the nation's animal agriculture, thus protecting animal health, public health, and the nation's food supply. The main activities of NAHLN member veterinary diagnostic laboratories (VDLs) include early detection of high-consequence animal diseases and rapid response to a disease outbreak by increasing the capacity for diagnostic testing and testing of large numbers of samples to confirm freedom of disease following implementation of control and eradication programs. NAHLN laboratories also conduct disease surveillance for existing or known (endemic) diseases in the US. In addition, some VDLs are CLIA (Clinical Laboratory Improvement Amendment) certified to test human specimens for emerging pathogens such as SARS-CoV-2 and Monkeypox virus. In summary, the veterinary diagnosticians and VDLs play a pivotal role in improving animal and human health in the US through collaboration among multiple professions—veterinary medicine, human medicine, environmental, wildlife, and public health to create innovative programs to improve animal and human health achieving the goals of One Health initiative.