



One Health Approach in Surveillance of Tick and Tick-Borne Diseases (TTBDs)

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Ticks and tick-borne diseases (TTBDs) are among the most severe and widespread concerns in many tropical places, with serious consequences for livestock production, wildlife protection, and human health [1]. TTBDs, which include East Coast fever (ECF), Crimean Congo hemorrhagic fever (CCHF), bovine babesiosis, and anaplasmosis, account for 60-80% of pathogenic illnesses and kill humans, wildlife, and domestic animals [2]. The One Health approach is a comprehensive strategy that recognizes the interrelation of human, animal, and environmental health, and it has proven to be effective in controlling TTBDs in various parts of the world [3]. One health surveillance is most important approach involves monitoring the incidence and prevalence of ticks and tick-borne diseases in both humans and animals [4]. It emphasizes the collaboration between various sectors, including human medicine, veterinary medicine, environmental science, and public health, to achieve optimal health outcomes for all [5]. The core idea behind One Health is that the health of humans, animals, and ecosystems are intimately linked, and addressing health challenges requires a comprehensive and collaborative approach [6]. When it comes to ticks and tick-borne diseases, implementing a One Health approach can be highly effective [7]. Here are some basic concepts regarding implementation of one health strategies to overcome on devastating effects of ticks and tick-borne diseases.

Collaboration and coordination

The One Health approach promotes collaboration and coordination among various stakeholders, including human health professionals, veterinarians, ecologists, entomologists, and environmental scientists. These experts work together to share information, resources, and expertise to effectively monitor and control TTBDs.

Integrated surveillance

Establishing a robust surveillance system that collects and analyzes data on vectors, pathogens, and disease occurrences in both human and animal populations. This involves collaboration between public health authorities, veterinary services, and environmental agencies to monitor and detect emerging threats.

Tick control

Implementing integrated tick control programs that combine various approaches for tick control. This includes acaricides usage, indoor residual spraying, environmental management (e.g., reducing breeding sites), biological control methods, and targeted use of acaricides. Coordinating these efforts between human health, veterinary services, and environmental agencies optimizes the effectiveness of tick control measures.

Risk assessment and early warning systems

Conducting risk assessments to identify areas and populations at high risk of ticks and tick-borne diseases. This involves evaluating factors such as climate change, habitat changes, and socio-economic conditions. Developing early warning systems helps in predicting outbreaks and initiating timely response measures.

Research and innovation

Encouraging interdisciplinary research to understand the ecology, transmission dynamics, and behavior of vectors and pathogens. This includes collaboration between scientists, veterinarians, entomologists, ecologists, and public health experts. Research efforts can contribute to the development of innovative tools, diagnostics, vaccines, and vector control strategies.

Health education and community engagement

Raising awareness among communities about vector-borne diseases, their prevention, and the importance of early detection and treatment. This involves educating individuals on personal protective measures, hygiene practices, and environmental management. Engaging communities empowers them to take an active role in disease prevention and control.

Policy and advocacy

Promoting policy changes and advocating for increased resources, funding, and international cooperation to combat TTBDs. This includes engaging policymakers, governments, and stakeholders to prioritize One Health approaches in national and international agendas.

The One Health approach has been applied to address a wide range of health issues, including zoonotic diseases, antimicrobial resistance, food safety, environmental pollution, and climate change impacts on health. By integrating knowledge and actions across disciplines, One Health strives to achieve optimal health outcomes for humans, animals, and the environment. By implementing these strategies within a One Health framework, it is possible to enhance vector control efforts, reduce the burden of vector-borne diseases, and promote sustainable health outcomes for both humans and animals.

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