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Introduction

Infectious diseases represent a signi cant challenge to both animal health and global public health security. e intricate interplay between pathogens [1], animal hosts, and human populations underscores the necessity for comprehensive understanding and e ective mitigation strategies. is article delves into the current trends and future directions in the eld of infectious diseases in animals, highlighting key issues such as emerging pathogens [2], evolving transmission dynamics, diagnostic advancements, treatment modalities, and preventive measures. Animals, both domestic and wild, serve as reservoirs and vectors for a diverse array of infectious agents, ranging from bacteria and viruses to parasites and fungi [3]. e dynamics of these diseases are in uenced by ecological factors, climate change, human activities, and the increasingly interconnected nature of global trade and travel. As such, the study and management of infectious diseases in animals require a multidisciplinary approach that integrates veterinary medicine, ecology, epidemiology, microbiology, and public health—known collectively as the One Health approach [4]. Recent years have witnessed outbreaks of novel pathogens with signi cant impacts on animal populations and, in some cases, spillover into human communities, exempli ed by diseases like avian in uenza, Ebola virus disease, and the ongoing challenges posed by antimicrobial resistance [5]. Understanding the mechanisms of disease emergence, transmission pathways, and host-pathogen interactions are crucial for e ective surveillance and early detection, essential pillars of disease control. Advancements in diagnostic technologies have revolutionized our ability to identify and characterize pathogens swi ly and accurately. Molecular techniques, next-generation sequencing, and bioinformatics tools enable researchers and veterinarians to detect emerging threats promptly, facilitating rapid response e orts to contain outbreaks and minimize their spread. In addition to diagnostics [6], innovative treatment strategies such as phage therapy and immunomodulation are being explored as alternatives to conventional antimicrobial therapies, addressing concerns over antibiotic resistance and ensuring sustainable practices in veterinary medicine. Looking forward, the eld of infectious diseases in animals faces numerous challenges, including the complexities of global trade and travel, climate change impacts on disease distribution, and the need for equitable access to veterinary care and resources in underserved regions. Future research endeavors