

Viruses without borders: One health implication

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Abstract

We are witnessing an incredible pace in infectious diseases of the 21st century, chief among them are viral threats which have caused not only mortality and morbidity, but also, overwhelmed health capacity systems in numerous countries especially in resource-limited regions of the world. Ebola virus and H7N9 avian influenza virus are 2 lethal pathogens that we have encountered in the second decade of the 21st century in West Africa in Southeast Asia, respectively. In addition, the recent outbreak of Zika virus in Brazil and other Latin American countries and the outbreak of Chikungunya virus in the Caribbean region are just few examples that viruses are capable of trans- borders epidemics of global threats. While specific clinical presentation for each virus category varies, the care is supportive. For viruses such as Ebola, Zika and Chikungunya, currently no vaccines are available. These viral outbreaks are significant public health threats especially in countries where public health standards are suboptimum. It is likely that the cases of these viral threats that have pandemic potential, will continue to occur in the future prospects, are unclear. However, the international surveillance is critical to detect the outbreaks and control them locally. Global health plays an increasingly crucial role in both global security and the security of global population. As the world and its economies become increasingly globalized, including extensive international travel and commerce, it is necessary to address the outbreak of viral threats in a global context. The WHO asserts epidemic-prone infectious diseases constitute the greatest threat to public health security and the disruption of social and economic developments of the member states. Experts acknowledge that the optimal way to build fences around infectious diseases at the source is to develop bridges between animal and human health professionals under an approach known as One Health. Already, several countries have set up coordinating offices, including in Laos, where the Prime Minister chairs the National Committee for the Control of Communicable Diseases. The Association of Southeast Asian Nations (ASEAN) has endorsed a plan to set up an ASEAN Coordination Center for Animal Health and Zoonoses and a formal agreement is expected to be signed by ASEAN member states in 2015. The WHO member countries agree to maintain an animal health policy and coordinate well; each nation would need to allocate funds to keep the center sustainable. The integrated human-animal health approach is the most effective strategy to reduce risk, detect and control viral epidemics. For example, Ebola in West Africa and Zika in Brazil in recent years, illustrate the importance of preventing, detecting and controlling viruses without borders to minimize public health impact and social and economic instability in countries around the world, and thus, a robust global action plan for optimal readiness and response to future outbreaks that may take place.

Introduction

Infectious diseases affect people, domestic animals and wildlife alike, with many pathogens being able to infect multiple species. Fifty years ago, following the wide-scale manufacture and use of antibiotics and vaccines, it seemed that the battle against infections was being won for the human population. Since then, however, and in addition to increasing antimicrobial resistance among bacterial pathogens, there has been an increase in the emergence of, mostly viral, zoonotic diseases from wildlife, sometimes causing fatal outbreaks of epidemic proportions. Concurrently, infectious disease has been identified as an increasing threat to wildlife conservation. A synthesis published in 2000 showed common anthropogenic drivers of disease threats to biodiversity and human health, including encroachment and destruction of wildlife habitat and the human-assisted spread of pathogens. Almost two decades later, the situation has not changed and, despite improved knowledge of the underlying causes, little has been done at the policy level to address these threats. For the sake of public health and wellbeing, human-kind needs to work better to conserve nature and preserve the ecosystem services, including disease regulation, that biodiversity provides

while also understanding and mitigating activities which lead to disease emergence. We consider that holistic, One Health approaches to the management and mitigation of the risks of emerging infectious diseases have the greatest chance of success. From a strict biological point of view, humans are just one species among other species, albeit one with very special capacities, characteristics, and skills. Among scientists, it is generally acknowledged that we share many features with other animal species, which are certainly relevant when the concepts of health and disease are discussed. The term 'One Health' is used in many different contexts and by people with varying backgrounds. However, there appears to be some confusion as to what the term really means, and it is used in a wide range of contexts, often including or bordering concepts such as infection biology, contagious diseases, zoonotic infections, evolutionary medicine, comparative medicine, and translational medicine. Without claiming to present the one and only true interpretation, we will argue for a wide approach using the 'umbrella' depiction developed by One Health Sweden. We argue that this one should, compared to other demarcations, be more useful to science.