

The effects of animals on human epidemics have been examined rarely in the past, regardless of the importance of such a topic. In contrast, the transfer of infectious diseases from human to human has received considerable attention. That dissimilarity might be due to the opinion that a human epidemic would occur only when a novel zoonotic pathogen becomes continually transmissible between humans.

Zoonotic infectious diseases caused by pathogens transmitted from animals to humans or from humans to animals, especially via spillover transmission, threaten the global public health of humans, animals, and the environment, but such phenomena remain to be addressed fully. The increase in outbreaks of emerging and/or re-emerging infectious diseases might be the reflection of the dynamic relationships among pathogens, hosts, and their environment. Interspecies disease transmission and subsequent outbreaks are prompted by successive processes that enable an animal pathogen to establish an infection in a human. Spillover transmission is determined by the disease dynamics in the host reservoir as well as pathogen exposure and other human factors related to the susceptibility to the infection.

Although humanity has been threatened by emerging infections, especially zoonotic spillover, since time immemorial, new emerging infections are increasing worldwide. Human immunodeficiency virus (HIV), severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), Ebola, Hendra, highly pathogenic avian influenza (HPAI), and other infectious diseases have emerged recently; diseases that were not heard of a century ago. Those diseases have recently emerged as zoonotic infectious diseases. Currently, in addition to those diseases, there is ongoing transmission of endemic zoonotic pathogens, such as *Salmonella* spp., *Leptospira* spp., and *Mycobacterium* spp., which are globally problematic in public health systems.

In the last three decades, over 70% of emerging and re-emerging infectious diseases in humans were considered zoonotic, and over 70% of those zoonoses originated from animals. Transmission of pathogens among species, especially zoonotic spillover, should be given serious attention because of the expansions in human and domestic animal populations and the changing animal-human interface; such changes can result in a pathogen breaking the species barrier between human and animal. Within

the global ecosystem, wildlife, domestic animals, and humans interact in a manner that has resulted in an interconnected transmission net for zoonotic pathogens, and humans can be infected directly or indirectly by those pathogens via that net.

In the past century, as a consequence of the development of an industrial society, anthropological, social, environmental, and economic changes have been dramatic. The changes have affected humanity and the environment and have accelerated the intrusion of novel pathogens into global human populations, sometimes with devastating consequences. In addition to changes in pathogens and hosts, socio-environmental changes have also occurred; for example, growth of human population, agricultural and urban development, increased international trade and travel due to globalization, climate change, environmental contamination, ecological disruption, and economic circumstance. Those changes may be closely related to the global outbreaks of emerging and re-emerging infectious diseases via changes in pathogens, hosts, and the environment.

The current situation related to zoonotic infections demands new control measures against emerging and/or re-emerging zoonotic infectious diseases. In addition, anyone and/or any country or agency should not develop control measures without collaboration with others, including those in other fields of research. Current outbreaks of emerging and/or re-emerging infectious diseases further acknowledge the close connection in human, animals, and environment.

The One Health Commission defined One Health as a collaborative effort of multiple disciplines—working locally, nationally, and globally—to attain optimal health for people, animals, and the environment. That concept acknowledges the close interconnection of human, domestic animal, and wildlife within the context of ecosystem. Also, it is necessary to establish a useful conceptual framework for the development of solutions to global health threaten.

Socioeconomic changes in Korea are similar to those occurring around the globe, and Korea has faced a number of outbreaks of emerging and/or re-emerging infectious diseases such as HPAI, MERS, foot-and-mouth disease (FMD), severe fever with thrombocytopenia syndrome (SFTS), Q fever, as well ongoing transmission of zoonotic pathogens including *Brucella* spp., *Salmonella* spp., *Leptospira* spp., *Mycobacterium*

spp., and *Escherichia coli* O157:H7 even though not all are zoonotic. Those infectious diseases and pathogens have also produced outbreaks in several countries adjacent to the Korean peninsula. Thus, if not already present, such pathogens could arise in Korea at any time; particularly, if appropriate control measures are not developed. Further, nobody can predict which kind of emerging and/or re-emerging pathogen will appear next. Such concerns lead us to suggest that solutions cannot be found without undertaking collaborative research within a framework of related works, as described by the One Health concept.

Therefore, in a special issue of our journal, we wanted to

present a collection of research related to **“Emerging and Re-emerging Infectious Diseases”** and include a review of the current situation regarding ongoing research related to this area. Although articles related to only a few emerging and/or re-emerging infectious diseases have been included in this issue, we hope this special issue of Journal of Veterinary Science will support the search for solutions to the spread of emerging and re-emerging infectious diseases by establishing collaborative research efforts and a network of researchers, workers, and related people interested in this subject.

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