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Editorial

One Health Concept Applied to Zoonoses and Infectious Diseases Transmitted by Arthropods

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According to the World Health Organization, the concept of One Health emerged to translate the interrelationships between human, animal, and environmental health. With increasing urbanization and globalization, and, consequently, with the decrease in the distance between people and the environment and wildlife, the association between human and animal health has become a relevant topic for the control of infectious diseases. Many of these diseases are transmitted by arthropod vectors and are linked to disturbances caused by anthropogenic actions (1,2).

Environmental changes can interfere directly in the physiology of both the pathogen and its hosts, and indirectly, resulting from the interaction between different species, promoting the emergence of new diseases and increasing the pathogenicity of the existing diseases. Environmental chemical pollution contributes to changes in the abundance of different species and can result in immunosuppression, which favours susceptibility to pathogens (2). Often, the alterations of the original habitat force pathogens into new ecological niches or facilitate their establishment and transmission, as found in the history of malaria and emerging diseases in the riverside areas of the Madeira River in the Amazon region (3).

Climate change can affect and modulate the epidemics of pathogenic agents by providing conditions for the proliferation of the arthropod vectors of infectious diseases and altering the proliferation of pathogenic agents disseminated by water (4). For example, the increase in average temperature and the occurrence of extreme events associated with global climate change contribute to the increase in the incidence of arboviruses common in the tropics and the northern hemisphere, as in the episode of autochthonous cases of dengue fever in France between 2013 and 2015 (https://ecdc.europa.eu/sites/portal/files/documents/dengue-annual-epidemiological-report-2016.pdf).

In developing countries such as those in Latin America, including Brazil, environmental degradation and climate change, associated with socioeconomic conditions, are contributed to a large increase in the number of cases of diseases transmitted by arthropods. Among these diseases, the most important ones in public health are malaria, trypanosomiasis, leishmaniasis, and arboviruses (5,6). Knowledge of the diversity of arthropod vectors, and vertebrate hosts, including the human population, as well as the pathogenic agents that circulate in each area, is fundamental for health institutions to prevent the risk of the occurrence of diseases transmitted by arthropods and to adequate vector population control. With the recent increase in arthropod-borne diseases affecting not only human health but several other taxonomic groups, there is an urgent need to identify the determinants of pathogen spread and to understand the reciprocal impact of infectious disease on human and animal populations.

In addition to environmental changes resulting

Author's Biosketch

Márcia Aparecida Sperança is an associate professor at the Center for Natural and Human Sciences at the Federal University of ABC. She received her PhD in Biology of the Host-Pathogen Relationship at the Institute of Biomedical Sciences at the University of São Paulo in 1999, in a sandwich program, performing a two-year scientific internship at the Department of Parasitology at the University of Leiden, Holland. Her doctoral subject included the molecular biology of parasites that cause human malaria. In 1999, she was hired as a professor and researcher at the Faculty of Medicine of Marilia, where she continued her cooperation until 2008 working on visceral leishmaniasis, Chagas disease, and arboviruses. Since 2009, Dr. Sperança has been the head of the Laboratory of Pathogenic Agents at UFABC, an institution with multi and interdisciplinary academic proposals, which are the characteristics of her investigation fields. Today, his research lines are related to the diagnosis and epidemiology of infectious agents, including Chagas disease, leishmaniasis, malaria, arboviruses and SARS-CoV-2, in the context of One Health.

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from deforestation, responsible for the proliferation of arthropod vectors, the presence of populations in areas close to forests results in the introduction of domestic animals such as dogs and cats, as well as cattle, horses, and goats. These animals can serve as hosts for the protozoa of the Trypanosomatidae family, the most important one for the health of the human and animal population, the parasites of the genus *Trypanosoma* and *Leishmania*, including the etiological agents of Chagas disease, and visceral and tegumentary leishmaniasis, respectively. Horses are particularly sensitive to alphaviruses endemic to regions with the Amazon biome, including Venezuelan equine encephalitis (7).

The use of insecticides to control agricultural pests or infectious diseases, the emergence of socio-economic difficulties, and environmental disasters can also contribute to the proliferation of infectious diseases, transmitters, vectors, and pathogens. The historical investigation of tegumentary leishmaniasis in the Middle East, more specifically in the city of Bam in Iran, demonstrated the association of the epidemic peaks of the disease with the interruption of the use of insecticides against malaria between 1979 and 1981, as well as the territorial expansion of the municipality between 1988 and 1992 and the earthquake in 2004 (8).

Zoonoses and infectious diseases transmitted by arthropods are part of the group of Neglected Tropical Diseases, which present a complex life cycle with hosts associated directly with environmental conditions which should be permanently monitored to find the best strategy to control and/or to prevent the occurrence and spreading of pathogens.

Competing Interests
None.

Ethical Approval
Not applicable.

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