



Vector-Borne Diseases in Zoonotic Concern and with Expansion of Vectors Affecting Humans and Animals

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ABOUT THE STUDY

Vector-borne diseases are human diseases caused by parasites, viruses, and bacteria that are transmitted through the vector. Every year, more than 700,000 people die from diseases such as malaria, dengue fever, cystostomy, African Trypanosoma, leishmaniasis, Chagas disease, yellow fever, Japanese encephalitis, and onchocerciasis.

The burden of these diseases is highest in the tropics and subtropics, affecting disproportionately the poorest areas of the population. Since 2014, outbreaks of dengue, malaria, chikungunya, yellow fever, and Zika have caused population declines, deaths, and overwhelming health care systems in many countries. Other illnesses such as chikungunya fever, leishmaniasis, and lymphatic filariasis cause chronic distress, lifelong morbidity, disability, and occasional stigma.

Vectors are organisms that transmit infectious pathogens from infected animals to humans or other animals. Vectors are often arthropods such as mosquitoes, mites, flies, fleas, and lice. The vector can actively or passively transmit the infection. Biological vectors such as mosquitoes and mites can multiply in the body and carry pathogens that can be transmitted to new hosts, usually by bites. Mechanical mediators such as flies can pick up infectious substances outside the body and infect them by physical contact. Vector-mediated diseases are called vector-mediated diseases. Many vector-borne diseases are zoonotic diseases, that is, diseases that can be transmitted directly or indirectly between animals and humans. These include example, Lyme disease, tick-borne encephalitis, West Nile virus, leishmaniasis, and Crimean-Congo hemorrhagic fever.

The major mosquito carriers of human disease have co-evolved with humans over a long period. However, the rapid increase in population and the accompanying expansion of agricultural activity, and the progress of urbanization have brought about ecological changes that have had a significant impact on the biology of mosquito vectors. Adapting malaria and major tree

disease vectors to new types of imaginary habitats recently created by human population growth and activity on a much shorter timescale can increase disease transmission rates. It is emphasized here in the context of sexuality. Possible measures that can reduce the impact of mosquito-borne infections on transmission are also outlined.

Symptoms of Vector-Borne Diseases are when a people who suffer from the vector-mediated illness usually develop a high fever with symptoms such as nausea, headaches, pain behind the eyes, skin rashes, joint pain, and muscle cramps. The symptoms are not specific and the disease needs to be diagnosed.

Vector-borne emerging and re-emerging infectious diseases are a serious public health concern worldwide. Some of these diseases have emerged and/or revived and have emerged in new areas over the last two decades. Studies have emphasized that interactions between pathogens, hosts, and the environment play an important role in the appearance or recurrence of these diseases. In addition, social and demographic factors such as population growth, urbanization, globalization, trade exchanges, travel, and close interactions with livestock are significantly associated with the appearance and/or recurrence of vector-mediated diseases increase. Other studies emphasize that progressive pathogen evolution, reservoir population growth, and antibiotic use are major exacerbating forces.

Types of vector-borne diseases

Malaria (protozoa): Malaria is a protozoan infection of red blood cells that is transmitted by the bite of the female Anopheles mosquito. Malaria is widespread in the tropics but is virtually eradicated in temperate climates. Malaria is characterized by fever attacks, the length of which depends on the particular *Plasmodium* species that is the causative agent.

Lymphatic filariasis (nematodes): Lymphatic filariasis, globally recognized as a Neglected Tropical Disease (NTD), is a parasitic disease caused by fine filamentous worms. Adults live only in the human lymphatic system. The lymphatic system maintains fluid

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Received: 22-Apr-2022, Manuscript No. TPMS-22-16878; **Editor assigned:** 27-Apr-2022, PreQC No. TPMS-22-16878 (PQ); **Reviewed:** 11-May-2022, QC No. TPMS-22-16878; **Revised:** 18-May-2022, Manuscript No. TPMS-22-16878 (R); **Published:** 25-May-2022, DOI: 10.35248/2329-9088.22.10.267

Citation: Casteel A (2022) Vector-Borne Diseases in Zoonotic Concern and with Expansion of Vectors Affecting Humans and Animals. TropMedSurg. 10: 267.

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balance in the body and fights infections. Lymphatic filariasis is transmitted from person to person by mosquitoes.

Dengue fever (virus): Dengue fever is transmitted by being bitten by *Aedes aegypti* infected with the dengue virus. Mosquitoes become infected when they bite a person who has the dengue virus in their blood. You cannot transfer directly from one person to another.

Leishmaniasis (protozoa): Leishmaniasis is a disease caused by an intracellular protozoan parasite (Leishmaniasis) transmitted by the bite of a female sandfly. The clinical spectrum of leishmaniasis ranges from self-solving skin ulcers to amputating mucosal disease and fatal systemic disease. For more severe illnesses, treatment has long been a challenge and has been exacerbated by the emergence of drug resistance. Parasites have been identified in most parts of the world, except Australia, the Pacific Islands, and Antarctica.

The emergence of previously unrecognized vector-borne diseases and the resurgence of relatively quiet or controlled diseases are primarily due to ecological changes that lead to increased vector population densities of the "origin" of some illnesses can be attributed to better diagnostic methods. Although the incidence of disease may remain limited, ecological changes that promote the spread of vector organisms can cause epidemics. Such outbreaks may be limited in duration and subside as the vector population density decreases. Or, as in the case of DHF, if the environment is modified to allow increased levels of vector reproduction and population, the infection may persist and spread. Other vector-borne infections will almost certainly emerge as the human population grows and development supports the spread of vectors and shifts the environment. An understanding of what happened in the past helps us better deal with what may happen in the future.