The American Society of Tropical Medicine and Hygiene
Advancing global health since 1903

Tropical Medicine & Tropical Diseases Issue Brief
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The American Society of Tropical Medicine and Hygiene (ASTMH) – the nation's leading professional organization for tropical medicine – represents 3,700 researchers and clinicians engaged in the battle against infectious and tropical disease in the United States and internationally. ASTMH promotes world health through research and education to prevent and control tropical diseases.

As part of our efforts, we advocate implementation and funding of federal policies and programs that seek to reduce, prevent, and control a myriad of infectious tropical diseases, including but not limited to, malaria, cholera, and tuberculosis. **ASTMH calls upon Congress and the Administration to increase funding for and its commitment to efforts to reduce and prevent tropical disease.**

Tropical Medicine

The term "tropical medicine" refers to the wide-ranging clinical work, research, and educational efforts of clinicians, scientists, and public health officials with a focus on the diagnosis, mitigation, prevention, and treatment of diseases prevalent in the areas of the world with a tropical climate. Most tropical diseases originate in either sub-Saharan Africa, parts of Asia (including the Indian subcontinent), or Central and South America. Many of the world's developing nations are located in these areas, thus tropical medicine tends to focus on diseases that impact the world's most impoverished individuals.

Clinicians, researchers, and public health officials with a background in clinical, epidemiological, and basic biochemical, immunologic, and molecular approaches to tropical diseases all fall within the realm of tropical medicine. The field encompasses clinical work treating tropical diseases, work in public health and public policy to prevent and control tropical diseases, basic and applied research related to tropical diseases, and education of health professionals and the public regarding tropical diseases.

Tropical Diseases[♦]

Tropical diseases caused by pathogens prevalent in areas of the world with a tropical climate. These diseases are caused by **viruses**, **bacteria**, and **parasites** that spread through various mechanisms, including airborne routes (respiratory diseases), sexual contact, contaminated water and food (due to a lack of clean water and sanitation in many developing countries), and through an intermediary or vector – frequently an insect (e.g. mosquito) that itself becomes infected from an affected individual and transmits it to others in the process of feeding (the mechanism for mosquito-to-human transmission.)

♦ Tropical diseases can be found in "non-tropical" climates; however, they are much more prevalent in areas with tropical climates.

Tropical Viruses

Viruses are microscopic, infectious agents that consists of genetic material covered by a protein shell and can only replicate within a host cell. Examples of viruses that cause tropical diseases include:

- *Arboviruses* – Short for "arthropod-borne virus." An arthropod is an invertebrate, such as a mosquito, tick, or fly, that may transmit pathogens to humans.

  - *Dengue fever* – A mosquito-borne virus that causes flu-like symptoms. Some infected individuals develop dengue hemorrhagic fever, a severe and sometimes fatal variation.

  - *Yellow fever* – An arbovirus that causes fever, hemorrhage, and often fatal liver complications.

- *Acquired Immunodeficiency Syndrome (AIDS)* – This widespread disease is caused by the human immunodeficiency virus (HIV). It is extremely prevalent in sub-Saharan Africa, and South and Southeast Asia. Most death is caused by secondary or opportunistic diseases.

- *Ebola* – Causes fever, severe headaches, backache, vomiting, diarrhea, and severe hemorrhaging. It is not clear how the Ebola virus is transmitted.

- *Marburg* – Related to Ebola, but with a somewhat lower mortality rate.

- *Lassa fever* – A fatal hemorrhagic fever transmitted by rodents that causes sharp backache, headache, sore throat, fever, rashes, dehydration, general swelling, skin hemorrhaging, irregular heartbeat, and disorientation.

Tropical Bacterial Diseases

Bacteria are more complex than viruses in that most replicate independently. Some bacterial diseases associated with tropical diseases include:

- *Cholera* – A diarrheal disease caused by the *Vibrio cholerae* bacterium found in contaminated water and shellfish. It is endemic in many tropical countries.

- *Escherichia coli* (*E. coli*) – *E. coli* causes diarrhea and malnutrition. It is found in undercooked meat, unpasteurized milk, and other foods.

- *Tuberculosis* – Caused by the *Mycobacterium tuberculosis*, it can last a lifetime and affect every organ in the body, but primarily the lungs. Symptoms include fatigue, weight loss, coughing, and difficulty in breathing. Tuberculosis is resurging as an opportunistic infection in HIV-positive individuals.

- *Hansen's disease (leprosy)* – Leprosy affects as many as ten million individuals worldwide and is caused by *Mycobacterium leprae*. It is transmitted by contact with infected skin or nasal secretions and can cause loss of sensation in the affected areas.

Tropical Parasites

Parasites are organisms that live within or on a host organism from which they gather nourishment. There are two types of parasites, protozoa (single cell organisms more complex than bacteria) and helminths (multicellular organisms frequently referred to as worms). Some parasitic tropical diseases include:

- *Malaria* – One of the most prevalent diseases on earth, it is caused by the single-celled *Plasmodium* parasite and is transmitted by the female *Anopheles* mosquito. It can lead to chills, fever, and sweating and can cause anemia, jaundice, kidney failure, and death.

- *Leishmaniasis* – A group of diseases caused by protozoa within the *Leishmania* genus and transmitted by female sandflies. Cutaneous leishmaniasis causes skin lesions that can leave scars or facial deformations. Visceral leishmaniasis leads to fever and weight loss and, eventually, death.

- *Trypanosomiasis* – Caused by protozoa of the *Trypanosoma* genus and transmitted by the blood-sucking reduviid bug, trypanosomiasis leads to fever, swelling of the lymph nodes, and sometimes inflammation of the heart muscle and brain. Many infected individuals will suffer from heart damage that will lead to cardiac arrest and death.

- *Schistosomiasis* – Caused by the flatworm, it is contracted by humans by bathing or working in water in which the flatworm's eggs are present. The eggs travel to the intestines or the bladder, where they can cause obstruction to blood flow or urine.

- *Filariasis* – Caused by a roundworm and transmitted by insects, it can cause damage to the lymphatic system and elephantiasis. One form of filariasis, known as onchocerciasis or "river blindness," is transmitted by blackflies can cause corneal scarring and frequently leads to blindness.

Several other protozoa and helminths are prevalent in the tropics and cause significant harm to those infected. These include hookworms, intestinal roundworms, and tapeworm.

Advancing Tropical Medicine and Controlling Tropical Disease

ASTMH maintains that the federal government should boost its funding for and involvement in efforts to advance tropical medicine and control the spread of tropical disease. Much of this work is currently underway at the Centers for Disease Control and Prevention, the National Institute of Allergy and Infectious Disease, and the U.S. Agency for International Development. Additional funds and a greater commitment from the federal government are necessary to make progress in tropical disease prevention, treatment, and control.

ASTMH calls upon Congress and the Administration to dedicate significant resources to support a comprehensive effort to eradicate tropical diseases across the globe.

111 Deer Lake Road, Suite 100 Deerfield, IL USA 60015 www.astmh.org
Phone: +1-847-480-9592 Fax: +1-847-480-9282 info@astmh.org