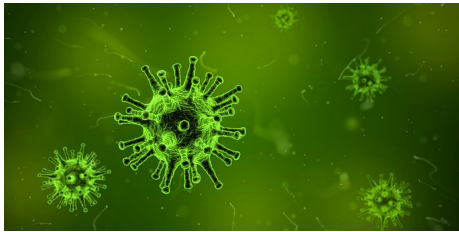


Mosquitoes And The Diseases They Spread

"Humanity has but three great enemies: Fever, famine and war; of these by far the greatest, by far the most terrible, is fever." – William Osler



Infectious diseases pose a complex problem for society.

Despite our great strides in science and technology, we as a species are still yet to truly conquer fever, famine, and war. Parts of the world are still in conflict, live without clean drinking water, and have limited or no access to healthcare. War can be solved through diplomacy and famine by aid, but infectious diseases pose a far more complex problem. It does not recognize races or borders. It adapts, ever eager to expose our weaknesses. Everyone is at risk. History is witness to how these microorganisms fell, in a couple of weeks or months, millions of men and women, and the measures, however terrifying, which were taken to control the disaster.

Rapid globalization of trade and travel, poorly planned urbanization, and progressive climate change have brought about the resurgence of various vector-borne diseases, infecting hundreds of millions and resulting in over a million deaths every year. Vectors are living organisms that transmit diseases between humans or from animals to humans. Infection generally occurs



Global trade and travel, as well as urbanization and climate change, have helped vector-borne diseases to spread.



Mosquitoes are a major disease vector.

during feeding when vectors ingest microorganisms from the blood of infected prey and inject it into the blood of their next prey. The most notable of such blood-suckers is the mosquito.

Mosquitoes have a complex life cycle: they hatch from an egg, complete a larval stage, become a pupa, then live and mate as adults for a brief 20-40 days. They thrive in tropical jungles and cityscapes or wherever the temperature is

Reading Sample



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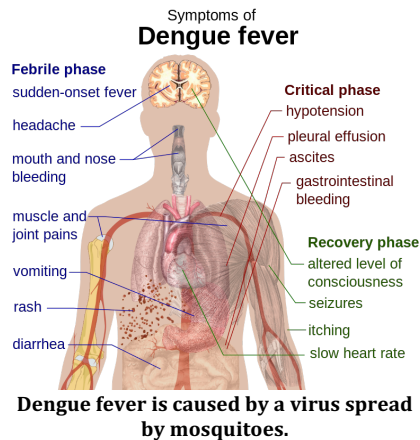
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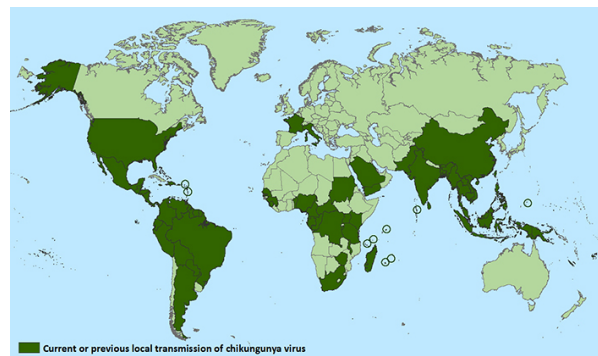


DENGUE FEVER

Dengue fever is a disease caused by the dengue virus. It is transmitted by the bite of an infected *Aedes* mosquito and occurs year-round in the tropics and sub-tropics. It is a viral disease characterized by the sudden onset of fever, headache, pain at the back of the eyes, and back pain, along with severe body pain lasting for about a week with or without accompanying nausea, loss of appetite, and vomiting. It is usually self-limiting, meaning it often runs itself out without treatment. There are four known strains (serotypes) of the virus, presenting with similar clinical manifestations. Infection by one serotype confers lifelong immunity to that specific serotype; however, a subsequent infection by another serotype increases an individual's risk of having a complicated – often life threatening - course of the disease such as dengue hemorrhagic fever with severe shock. Currently, a dengue vaccine has been licensed for use for patients aged 9-45 years in dengue endemic areas.

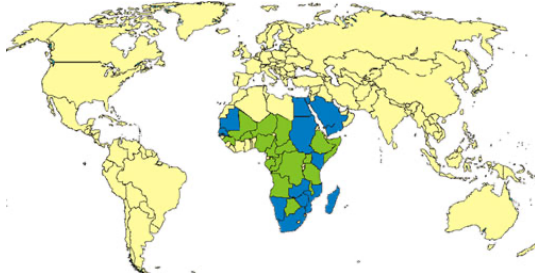
CHIKUNGUNYA

Chikungunya fever is caused by the chikungunya virus and is transmitted by the *Aedes* mosquito. It usually manifests as fever with severe joint pains accompanied by chills. It primarily affects the small joints of the hands, wrists, ankles, and feet. It is also self-limiting and requires only supportive treatment but cases have been reported of joint stiffness and joint pain persisting for years after the resolution of the infection. The name chikungunya comes from the Kimakonde language, spoken in Tanzania and Mozambique, which describes the stooped appearance adopted by a person with severe joint pain.



Chikungunya occurs in the middle east, Africa, and the Americas.

RIFT VALLEY FEVER



Rift Valley fever is endemic to several African nations. (In blue. Countries experiencing some cases are shown in green.)

Rift valley fever is caused by the Rift Valley fever virus. Aside from humans, it also affects sheep, cattle, and goats. In addition to being vector-borne, it may also be transmitted through infected saliva and mucus. Much like other vector-borne viruses, it manifests with fever and severe body pain; however, a small portion of infected

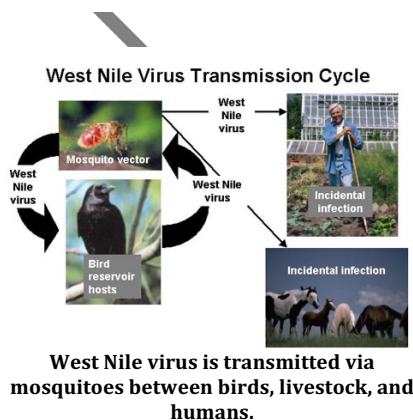
individuals may have prominent liver, renal, or eye effects, such that cases of irreversible vision impairment have been reported.

YELLOW FEVER

Ecobottle Sample

TWTF

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WEST NILE FEVER

West Nile fever is caused by the West Nile virus transmitted by the *Culex* mosquito in Africa, the Middle-East, Southern Europe, and Asia. It is also present in all states of the US, Canada, Mexico, South America, and the

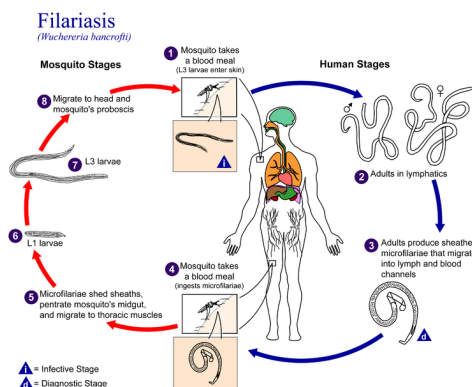
Caribbean. It was initially transmitted among wild birds through mosquitoes and eventually infected humans. It presents with the typical syndrome of fever and body pain but is often accompanied by rashes on the upper body. Elderly patients and those with co-morbid conditions are often beset by more serious complications such as encephalitis and severe fatal hepatic necrosis.

JAPANESE ENCEPHALITIS

Japanese encephalitis is a severe and fatal disease caused by the Japanese encephalitis virus (JEV) and is found throughout Asia and in some parts of mainland Australia. JEV is the main cause of viral encephalitis in many Asian countries, with an estimated 68,000 clinical cases every year. It is transmitted by *Culex tritaeniorhynchus* and may also infect pigs and horses. It results initially in fever and body pain, but rapidly progresses to deterioration of mental status and vital functions.



Japanese encephalitis is found throughout Asia.



Lymphatic filariasis is caused by the parasite *Wuchereria bancrofti*, among others.

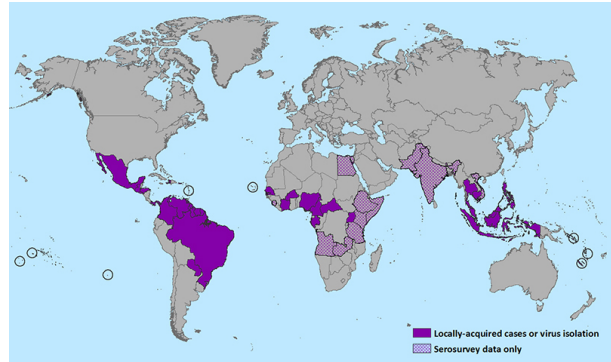
LYMPHATIC FILARIASIS

Lymphatic filariasis is caused by the parasites *Wuchereria bancrofti*, *Brugia timori*, and *Brugia malayi*. They affect about 110 million people in the tropics and subtropics and are transmitted through the bites of infected *Culex*, *Anopheles*, or *Aedes* mosquitoes. In 2000, more than 120 million people were found to be infected, a third of whom were severely disfigured by the disease. The adult forms

of these organisms cause damage to the lymphatic vessels, leading to inflammation and obstruction. Once obstructed, the vessels dilate, producing brawny edema (swelling of body parts, such as hands and feet), and hyperkeratosis (thickening of the skin), collectively known as *elephantiasis*.

ZIKA DISEASE

Zika disease is caused by the Zika virus and is transmitted by *Aedes* species. It was first discovered in Africa in the 1940s but has since made its way across Asia and the Americas. Aside from the mosquito bite, it can also be transmitted via sexual contact and blood transfusion. It causes mild flu-like symptoms; however, more recent findings



Zika has been transmitted in many parts of the southern hemisphere.

have linked Zika infection with birth defects and debilitating neurological disorders. Recent outbreaks have made it a global concern, prompting the international community to ramp up their efforts to contain the spread of the disease and its primary vector – the *Aedes* mosquito.

FIGHTING MOSQUITO-BORNE DISEASES

The World Health Organization (WHO) and multiple national governments are working together to provide education and increase awareness regarding the diseases mentioned herein. In addition, the organization has initiated several control programs, providing subsidized or free medicine to affected populations worldwide. Avoiding travel to affected areas, keeping surroundings clean and free of stagnant water, and vaccinating are some of the ways they advocate to control and eliminate the diseases.

Reading Comprehension Questions

1. Briefly
2. Among the mosquitoes, which genus is a vector for the most number of diseases?
3. What is
4. Malaria caused by which *Plasmodium* species is considered the deadliest?
5. List
6. What
7. What four types of animals are affected by Rift Valley fever?
8. What
9. Where is the West Nile virus found?
10. How
11. What have recent findings linked to the Zika virus?

Extension Questions

12. Do some research on the Spanish flu (1918) and the Black Death (1346-53). How many people died and what caused the diseases?
13. For the next question, go to
14. Using the

Ecobottle Sample



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TWF READING

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