**Assignment**

1. **Consider a disease known as diabetes mellitus, which is characterized by an increase in the blood sugar level. Infectious agents may contribute to the development of the disease in early childhood, but are not the main cause of the disease. Can it be classified as communicable? Explain your reasons**

-Communicable diseases are those that can be spread between individuals in a horizontal manner, much like a cold/flu, so we are disregarding vertical/genetic disease transmission in this instance.

-Diabetes is a chronic condition associated with abnormally high levels of sugar (glucose) in the blood. Insulin produced by the pancreas lowers blood glucose. Absence or insufficient production of insulin, or an inability of the body to properly use insulin causes diabetes.

-Now because you cannot spread diabetes to someone who doesn’t have it. It is not considered to be communicable.

1. **How would you classify pulmonary tuberculosis using the epidemiologic method? What is the main importance of such classification?**

Tuberculosis remains one of the deadliest diseases in the world. The World Health Organization (WHO) estimates that each year more than 8 million new cases of tuberculosis occur and approximately 3 million persons die from the disease. Ninety-five percent of tuberculosis cases occur in developing countries, where few resources are available to ensure proper treatment and where human immunodeficiency virus (HIV) infection may be common. It is estimated that between 19 and 43% of the world's population is infected with Mycobacterium tuberculosis, the bacterium that causes tuberculosis infection and disease.

In the United States, an estimated 15 million people are infected with M. tuberculosis. Although the tuberculosis case rate in the United States has declined during the past few years, there remains a huge reservoir of individuals who are infected with M. tuberculosis. Without the application of effective treatment for latent infection, new cases of tuberculosis can be expected to develop from within this group.

Tuberculosis is a social disease with medical implications. It has always occurred disproportionately among disadvantaged populations such as the homeless, malnourished, and overcrowded. Within the past decade, it also has become clear that the spread of HIV infection and the immigration of persons from areas of high incidence have resulted in increased numbers of tuberculosis cases.

Cough is the most common symptom of pulmonary tuberculosis. Early in the course of the illness, it may be nonproductive, but subsequently, as inflammation and tissue necrosis ensue, sputum is usually produced and is key to most of our diagnostic methods. Hemoptysis may rarely be a presenting symptom but usually is the result of the previous disease and does not necessarily indicate active tuberculosis. Hemoptysis may result from residual tuberculous bronchiectasis, rupture of a dilated vessel in the wall of a cavity (Rasmussen's aneurysm), bacterial or fungal infection (especially *Aspergillus* in the form of a mycetoma) in a residual cavity or from erosion of calcified lesions into the lumen of an airway (broncholithiasis). Inflammation of the lung parenchyma adjacent to a pleural surface may cause pleuritic pain.

1. **Describe four or more bacterial vaccine-preventable diseases that have the same modes of transmission.**

The vaccine circulates in the body and stimulates white blood cells called lymphocytes to begin producing special defensive proteins known as antibodies. Antibodies are also normally produced whenever a person is infected with active bacteria or viruses transmitted from a reservoir in the community.

Antibodies and white blood cells are very important natural defenses against the spread of infection in our bodies because they can destroy infectious agents before the disease develops. What vaccination does is to stimulate this normal response, by introducing a weakened or killed form of infection, which the white blood cells and antibodies attack.

Some vaccine-preventable diseases are not reportable events in many countries. The estimates of the burden of disease by the World Health Organization (WHO) are based on a combination of often incomplete vital registration data, mortality survey data, and mathematical models using numerous assumptions. Most models of vaccine-preventable diseases are derived from the susceptible fraction of the population (calculated from natural immunity from presumed historical infections in regions without previous vaccination and historical immunization coverage rates), infectivity rates of disease, sequelae of diseases, and estimates of local CFRs.

The degree of accuracy of these models is only as good as the data supporting the assumptions. A range of values reflecting uncertainty most appropriately represents the disease burden. In this chapter, we estimate the burden of disease as the number of deaths and DALYs per World Bank region in 2001. The following description draws in part on the discussion of methods for the burden of disease calculations reflected in the Global Immunization and Vision Strategy of WHO and the United Nations Children's Fund (UNICEF)

Tetanus is a neurological disorder, that is, a disorder of the nervous system. Symptoms of tetanus are tight muscles that are difficult to relax, and muscle *spasms* (muscle contractions that occur without the person wanting them to). These problems with the muscles are caused by a toxin (poison) produced by the bacteria called *Clostridium tetani*.

Tetanus is among the top ten causes of illness and death in newborns in Ethiopia. Tetanus in newborns is called neonatal tetanus. Nine out of every 1,000 newborns in Ethiopia have neonatal tetanus. More than 72% of the newborns who have tetanus will die.

Tetanus is also common among older children and adults who are susceptible to the infection. Unvaccinated persons are at risk of the disease, and people who have a dirty wound which favors the growths of the bacteria that cause tetanus are especially vulnerable.

1. **What are the causes and methods for preventing bacterial meningitis?**

Meningitis is an inflammation of the membranes (meninges) surrounding your brain and spinal cord.

**Symptoms**

* Sudden high fever
* Stiff neck
* Severe headache that seems different than normal
* Headache with nausea or vomiting
* Confusion or difficulty concentrating
* Seizures
* Sleepiness or difficulty waking
* Sensitivity to light
* No appetite or thirst
* Skin rash (sometimes, such as in meningococcal meningitis)

**Bacterial meningitis**

Bacteria that enter the bloodstream and travel to the brain and spinal cord cause acute bacterial meningitis. But it can also occur when bacteria directly invade the meninges. This may be caused by an ear or sinus infection, a skull fracture, or, rarely, after some surgeries.

**-Prevention**

Common bacteria or viruses that can cause meningitis can spread through coughing, sneezing, kissing, or sharing eating utensils, a toothbrush or a cigarette.

These steps can help prevent meningitis:

**-Washing of hands.** Careful hand-washing helps prevent the spread of germs. Teach children to wash their hands often, especially before eating and after using the toilet, spending time in a crowded public place or petting animals. Show them how to vigorously and thoroughly wash and rinse their hands.

**-Practice good hygiene.** Don't share drinks, foods, and straws, eating utensils, lip balms or toothbrushes with anyone else. Teach children and teens to avoid sharing these items too.

**-Stay healthy.** Maintain your immune system by getting enough rest, exercising regularly, and eating a healthy diet with plenty of fresh fruits, vegetables, and whole grains.

**-Cover your mouth.** When you need to cough or sneeze, be sure to cover your mouth and nose.

If you're pregnant, take care of food.

**5. Explain two characteristics that illustrate how the Anopheles larvae are different from other mosquito larvae. Using illustration is advised**

**Anopheles mosquito-**they doesn't have a siphon and stays parallel to the water surface.

-Aedes mosquito –have a hairy body

-Culex mosquito– Very similar to Aedes but have a lighter color compared to Aedes

-Now Aedes mosquitoes are the easiest to identify. They are black and have white patches.

-Culex and Anopheles are yellow-ish, but you can identify them by observing their resting position. Anopheles mosquitoes have a ~45-degree angle, while Culex stays parallel to the surface. Microscopically, look for antenna morphology.

According to egg laying mechanisms

-Two common types of mosquitoes lay their eggs in water: anophelines, which can be vectors of malaria, and culicines, which do not carry malaria. It is very important that you know the difference in the morphology (structure and shape) of these mosquitoes to identify the exact breeding habitats that support the development of the potential vectors.