**Malaria: Epidemiology, Prevention and Control**

Malaria is a mosquito-borne infectious disease of humans and other animals. Malaria is caused by parasitic protozoans of the genus Plasmodium, which is transmitted via the bites of infected mosquitoes. In the human body, the parasites multiply in the liver and then infect red blood cells.

Symptoms of malaria include fever, headache and vomiting, and usually appear between 10 and 15 days after the mosquito bite. If not treated, malaria can quickly become life-threatening by disrupting the blood supply to vital organs. In many parts of the world, the parasites have developed resistance to a number of malaria medicines.

**Malaria mode of transmission:**

The malaria parasite is transmitted by female Anopheles mosquitoes.

There are four parasite species that cause malaria in humans:

1. Plasmodium falciparum: malignant tertian malaria (most dangerous)

2. Plasmodium vivax: benign tertian malaria

3. Plasmodium ovale: benign tertian malaria

4. Plasmodium malariae: quartan malaria

Plasmodium falciparum and Plasmodium vivax are the most common among human.

Malaria transmission mostly occur in warm areas.

**Epidemiology**

Malaria is considered one of the most serious infectious diseases that lead to death worldwide.

Globally, many countries have arrived to the elimination phase before 2000 , however, there are always new reported cases in these countries each year. Africa is an endemic area due poverty and some environmental factors such as climate especially humidity and hot temperature where is the vector (Anopheles mosquitoes ) and the malaria parasites can survive, increase and spread. In 2010, The World Health Organization estimates there were 219 million clinical episodes, and 660,000 deaths caused by malaria. Children and pregnant women are more susceptible to malaria infection because of their low immunity.

There are around 3,500 species of mosquitoes. Human malaria only is transmitted by females of the genus Anopheles. Out of 430 Anopheles species, there are only 30-40 that transmit malaria which are the vectors of malaria parasite. Malaria is transmitted by different species of Anopheles, according to the region and the environment.

**Malaria in Saudi Arabia**

In Saudi Arabia transmission is geographically limited. Areas at the southern region are at risk of malaria transmission, specifically Asir and Jizan. None in the cities of Jeddah, Mecca, Medina, Riyadh, and Ta’if. The Dominant Malaria Species

In Saudi Arabia is P. Falciparum. Saudi Arabia has succeeded to reach the “Elimination Phase”. Between 2000 and 2011, Saudi Arabia achieved a decrease in malaria cases and case incidence rates of ≥75%. There is a Steep Decline In Case Numbers, that Saudi Arabia was able to Report only 68 locally-acquired cases in 2011. Most cases of malaria reported in Saudi Arabia are brought into the country by workers from other countries. However, locally acquired malaria does occur, principally in the Tahama (Tihamah) region, e.g., Jizan and Makkah. Most cases occur during the rainy season, increasing between October until March.

**Prevention and Control**

The goal of the malaria control and elimination program is interruption of malaria transmission. By 2012, the objectives of the regional strategy had been reached in many countries of the Region. The United Arab Emirates and Morocco were certified as malaria-free, and the Syrian Arab Republic and Iraq were reporting no local transmission. There was a significant reduction in the malaria burden in the Islamic Republic of Iran and Saudi Arabia.

Malaria is prevalent in tropical and subtropical regions because rainfall, warm temperatures, and stagnant waters provide habitats ideal for mosquito larvae.

**Vector control** is the main way to reduce malaria transmission at the community level. It is the only intervention that can reduce malaria transmission from very high levels to close to zero. For individuals, personal protection against mosquito bites represents the first line of defense for malaria prevention.

Two forms of vector control are effective in a wide range of circumstances.

Vector control is crucial. It includes indoor residual spraying (IRS) and **long-standing insecticidal nets** (LLINs).

**Indoor spraying with residual insecticides:** Indoor residual spraying (IRS) with insecticides is a powerful way to rapidly reduce malaria transmission.

However, the insecticide resistance is on the rise. The WHO report says that insecticide-resistant mosquitoes already inhabit 64 malaria endemic countries. The problem is more severe in sub-Saharan African countries where mosquitoes are frequently resistant to compounds known as pyrethroids and even to the organochloride DDT.

**Control of larval stages** by elimination of mosquito breeding sites, for example by filling and draining or by increasing the speed of water in natural or artificial channels.

**Intermittent preventive treatment with a full curative dose** of an effective anti-malarial drug is a highly effective measure for reducing the malaria burden among pregnant women in areas of moderate to intense *P. falciparum* transmission. This is promoted in Africa, but of limited use in other parts of the world, partly because transmission there is often less intense.

**Measures in non-endemic areas**, control of malaria can be done by firstly reporting the confirmed cases to a local health authority, isolating suspected cases is crucial, keeping the patients in mosquito-proof areas from dusk to dawn, until microscopy shows that they have no gametocytes in the blood, and Tracking the source of infection and all contacts is critical.

**Measures for non-immune travelers***:* The most important thing that travelers should do is protecting themselves from mosquitoes’ bits when they travel to malarious areas. There are certain guidelines that are important to follow, including wearing proper clothes with long sleeve especially at night, apply insect repellent to uncovered skin, and using nets over the beds and anti-mosquito sprays or insecticide dispensers.

**International Measures**: Disinsectization of aircraft, ships and other means of transportation using a residual spray application of an effective insecticide is a cardinal international measure that should be done in several occasions including: before boarding passengers or in transit and also if the health authority at the place of arrival has reason to suspect importation of malaria vectors.

Administration of anti-malarial drugs in special occasions like potentially infected migrants, refugees, seasonal workers and persons taking part in periodic mass movement.