In recent decades some mosquito-borne diseases have emerged. Recent outbreaks of Dengue, Chikungunya and West Nile virus in countries previously free from these diseases signal some of the potential threats associated with changes in environment, trade and travel. Focus on MediLabSecure priorities diseases.

**Dengue**

Dengue (DEN) is a viral infection caused by a *Flavivirus* (*Flaviviridae*) transmitted between humans by *Aedes* mosquitoes - predominantly *Aedes aegypti* and to a lesser degree *Ae. albopictus*.

Dengue virus is a leading cause of illness - from mild disease to dengue shock syndrome dengue hemorrhagic fever - and death. There are currently no vaccines or specific therapeutics, and substantial vector control efforts have not stopped its rapid emergence and global spread.

It is the most rapidly spreading mosquito-borne viral disease in the world. Risk factors for dengue in Middle-East are potentially increasing (immigrant work force from dengue-endemic countries, increased travel and increased urbanization leading to higher risk for urban mosquitoes like *Ae. albopictus*).

The threat of a possible outbreak of dengue fever now exists in Europe and transmission of dengue by *Ae. albopictus* was reported in France and Croatia in 2010.

**Chikungunya**

Chikungunya (CHIK) is a viral infection caused by an *Alphavirus* (*Togaviridae*) transmitted between humans by *Aedes* mosquitoes.

CHIK causes severe joint pain. However the disease shares some clinical signs with dengue, and can be misdiagnosed in areas where dengue is common. There are no vaccines or specific therapeutics.

Since 2004, chikungunya fever has reached epidemic proportions, with considerable morbidity and suffering. The virus has spread into novel locations, such as Europe, and has led to millions of cases of disease throughout countries in and around the Indian Ocean. The risk of importation of CHIKV into new areas is ever present because of the high attack rates associated with the recurring epidemics, the high levels of viremia in infected humans, and the worldwide distribution of the vectors responsible for transmitting CHIKV.
West Nile Fever

West Nile fever (WNF) is a zoonosis caused by a Flavivirus (Flaviviridae) transmitted mainly by Culex mosquitoes. Wild birds are the main vertebrate hosts. Under favorable environmental conditions, this cycle may be amplified and lead to human and horse infections.

WNV can cause severe diseases such as encephalitis or meningitis. There are currently no vaccines or specific therapeutics. The main preventive measures are aimed at reducing exposure to mosquito bites.

The impact on human and horse health of West Nile fever recently and dramatically increased in the Mediterranean and Black Sea regions. Involving several mosquito and vertebrate species, WNF epidemiology is complex.

Rift Valley Fever

Rift Valley fever (RVF) is an emerging zoonotic diseases affecting primarily domestic ruminants but also humans. It caused by a Phlebovirus (Bunyaviridae) transmitted primarily by Aedes, Culex and Anopheles mosquitoes. Several genus and species of mosquito are able to act as vectors for transmission of the RVF virus.

Severe symptom can progress to hemorrhagic fever or encephalitis (inflammation of the brain). There are currently no vaccines or specific therapeutics for humans. Vaccines are only available for ruminants. Surveillance and diagnostic methods are available, but control tools are limited: vector control is difficult to implement.

RVF epidemics are more and more frequent in North Africa and the Middle East, probably in relation with climatic changes (episodes of heavy rainfall in eastern and southern Africa), as well as intensified livestock trade.

The best strategy to protect our countries is to develop more efficient surveillance and control tools and to implement coordinated regional monitoring and control programs.