

Rift Valley Fever: Is the United States really at risk for introduction of RVFV?

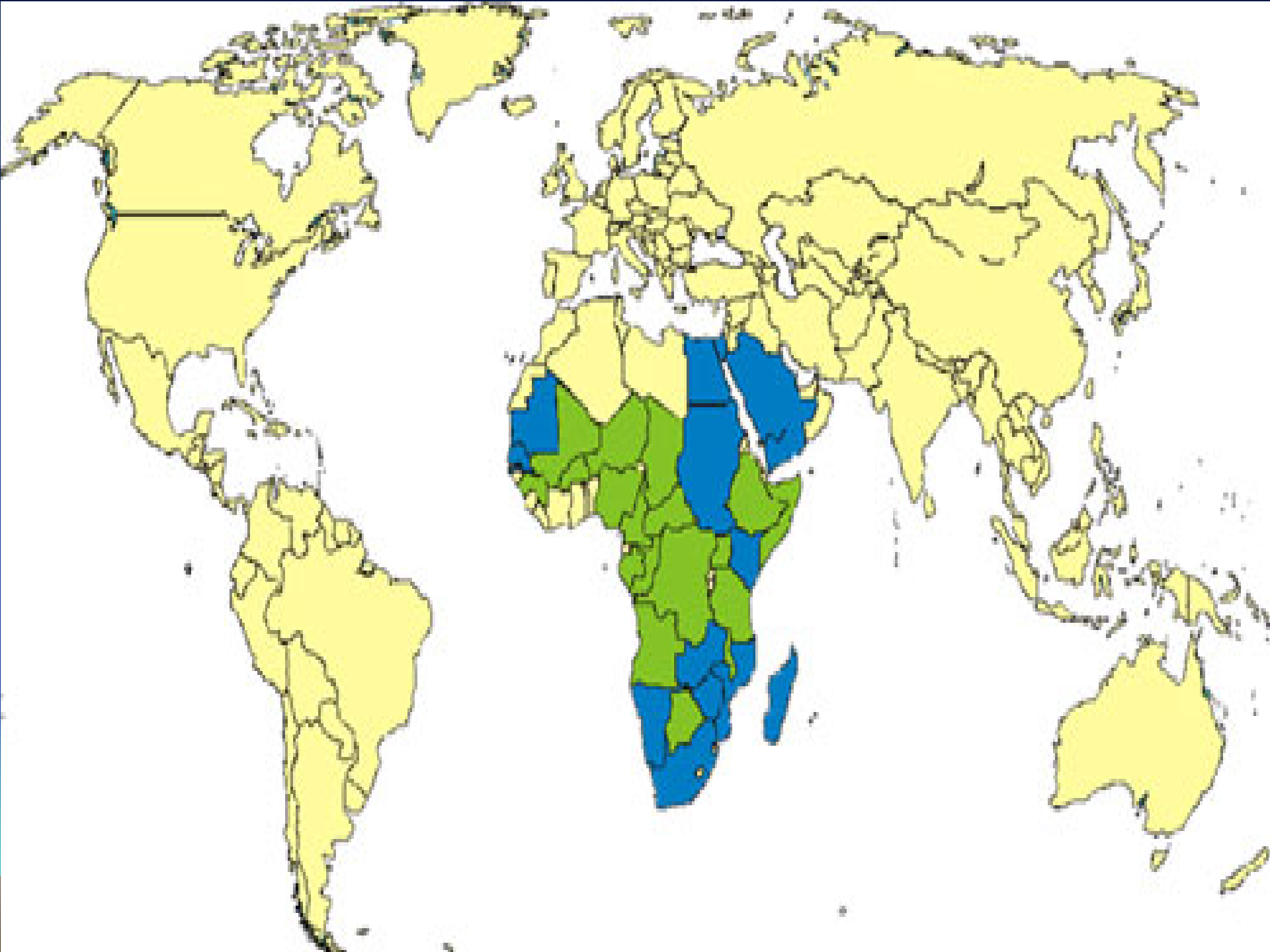
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- RVF continues to get the attention as a potential agricultural and zoonotic disease threat to USA.
- “the presence of competent vectors in countries free of RVF, the high viral titers in viremic animals and the global changes in climate, travel and trade all contribute to make this virus a threat that must not be neglected as the consequences of RVF are dramatic, both for human and animal health” (Pepin M, Bouloy M, Bird B, et al. 2010).



Aim

- To assess the threat of introduction of RVF in non-endemic regions, particularly into the USA.
- Qualitative assessment it is not a complete risk assessment process

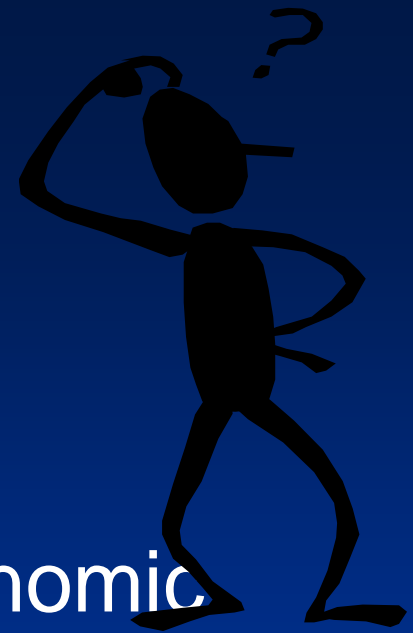


Why Now?



- USDA recent task to assess and prioritize a list of damaging animal disease threats
- RVFV was ranked 4th on this list using 8 criteria.

Why Now?



- Criteria are: epidemic potential, economic impact, trade impact, zoonotic potential, morbidity/mortality, cross-species potential, inability to detect rapidly, and inability to vaccinate against.
- What about the likelihood of introduction?

Previous assessment of the threat

- The USDA, APHIS, Veterinary Services (2007)
- The European Food Safety Authority (2005)
- Both indicated that introduction into the USA and the European Union is feasible but its likelihood is either negligible or low.



Previous assessment of the threat

- Three primary pathways, excluding intentional introductions, were examined:
 - Imported infected animals;
 - Infected humans arriving by air;
 - Infected vectors arriving in cargo or on airplanes.



Introduction of RVFV by live animals or animal products

- The likelihood of importation of infected animals into the USA is negligible.
- Wildlife importations require an extensive quarantine period to prevent the introduction of foreign animal diseases into the USA.



Introduction of RVFV by live animals or animal products

- If contamination of a product was present at the point of export the probability of some product remaining infectious at the point of destination in Europe was high.
- The risk of RVFV entering by infected animal product cannot be considered negligible.



Intentional introduction



- Requires high doses of virus via an effective route for establishing the infection;
- Require injection as the method of delivery;
- A method not attractive to those meaning to do harm to the USA.

Introduction of RVFV through humans

- Statements about the potential for one USA native mosquito feeding on an RVFV infected human arriving by air or sea initiating an outbreak in the USA
- These events include cascade of events to occur for this condition to occur with both humans and vectors.



RVF vs. Malaria

- Malaria was considered endemic in the southeastern USA prior to the 1950's
- Improved housing and socioeconomic conditions, environmental management and vector control efforts stopped malaria transmission in the USA.
- The mosquitos as the vector for malaria are still present in the USA today.



RVF vs. Malaria

- So far no reported significant autochthonous transmissions of malaria have occurred in the USA
- The likelihood should be high given the many unreported cases (1,691 cases), the thousands of passengers arriving each year from malaria endemic areas of the world, and the presence of competent vectors.



Introduction by vectors

- Mosquitos arriving on aircraft or in cargo;
- Infected mosquitos would need to find a susceptible host (animal or human) in the vicinity of its arrival location;
- The susceptible host would then need to become infected, amplify the virus and then transmit it to a local vector;
- A high enough vector competence index to initiate local transmission.



RVF vs. WNV

- Susceptible host range is much wider with WNV as compare to RVF;
- Engagement of wild avian species with WNV transmission;
- Historically WNV occurrence in some of the European countries (South part)
- Viremia period with WNV is longer that RVF in susceptible hosts



What is the risk of introduction of RVFV to the USA?

- The likelihood of natural introduction of RVFV into the USA is negligible in the inter-epidemic periods from countries endemic with the virus and low in epidemic periods (i.e. during outbreaks);
- There are small conditional probabilities of the individual events required for the successive event of transmission



What is more?



- Recent research activities on Rift Valley Fever virus in the USA and elsewhere have improved the understanding of the epidemiological and agent characteristics.
- This research has led to implementation of risk reduction strategies in countries known to experience outbreaks and to improve monitoring of disease events outside of these countries.



Don't Ask

