

Rift Valley Fever Outbreaks and control In Middle East.

OIE regional seminar ”*Re-emergence
of Rift Valley Fever in South Africa
:how to better predict and respond*

Bloemfontein (South Africa), 16-
18 February 2009



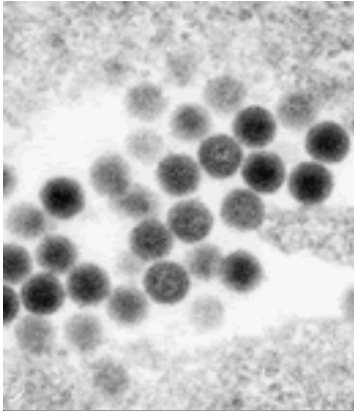
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Plan

-  Introduction,
-  Geographic distribution of RVF.
-  RVF in Arabic peninsula & topography of Tiham coast.
-  Outbreaks in Saudi Arabia and Yemen.
-  Animal trade movements and risk of RVF introduction
-  Consequences of RVF outbreak impact.
-  New risk areas.
-  Control.
-  Conclusion. and perspective

INTRODUCTION



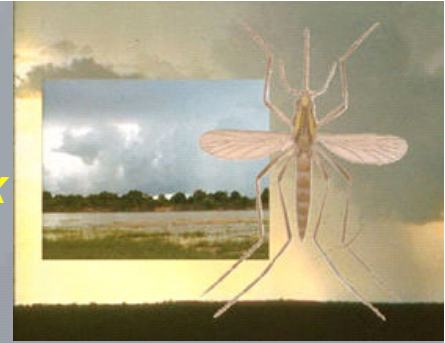


Virus

- ◆ RNA
- ◆ Phlebovirus

vector

- *Spp. Aedes and Culex*



Environment



Human beings

Direct contact with infected material

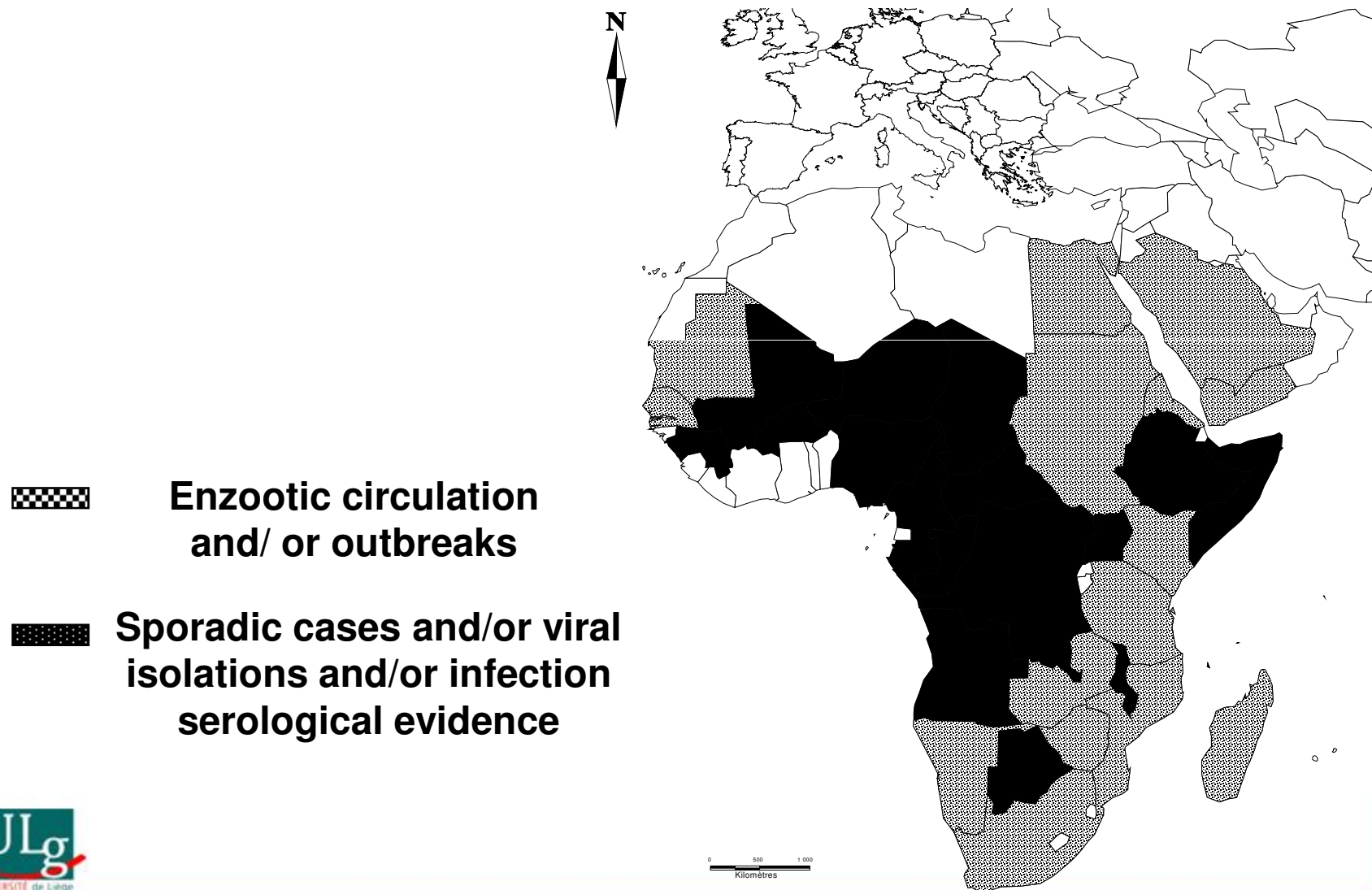
- ◆ Often unapparent infection or flu syndrome rarely fatal

Animal

Transmission to animal following blood feeding

- ◆ Affects principally small ruminants, cattle and camelids
- ◆ Direct (mortality, abortion) and indirect losses (commercial ban)

Geographic distribution of RVF (1930 – 2008)



Current regional situation of Rift Valley Fever in East Africa

Years	Country	Morbidity Human	Mortality Human	Reference
30 Dec 2006 to 12 March 2007	Kenya	684	155	WHO,OIE
January 2007	Somalia	114	51	WHO
3rd January 2007	Tanzania	264	109	WHO,OIE
14 November 2007	Sudan	698	222	WHO,OIE



No outbreaks in Djibouti except few seropositive cases detected in 2006



Sudan confirmed few animals cases during 2007 last outbreaks while very severe outbreaks with many human mortality cases



All the outbreaks of 2006-2007 were during the highest peak of exportation of fasting and pilgrim period. From 10-15 million of live animals yearly exported to the region.

RVF outbreak in Arabic Peninsula

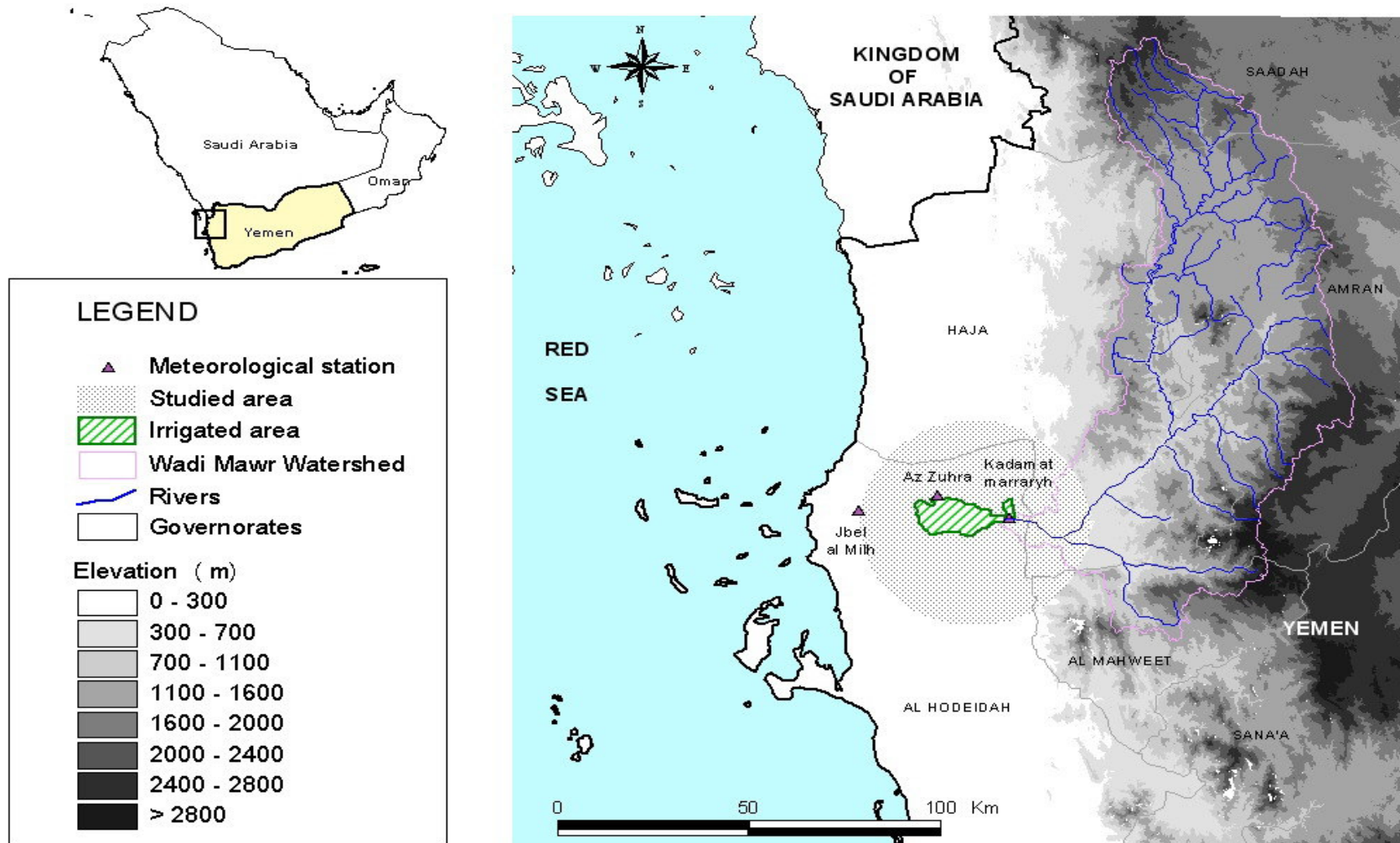
- ➔ **Sept 2000: wave of animal abortions recorded in Tihama region west coast of Saudi Arabia and Yemen**
 - Sept 15th: Saudi Arabia declared officially outbreak of RVF in Jazan and Asir after the confirmation of IgM sero+ by CDC
 - Sept 19th Yemen declared officially outbreak of RVF at Az-Zuhrah district Wadi Mawr
 - Sept 28th confirmed by NAMUR3 Lab.

➔ **First RVF occurrence out side Africa**

➔ **Phylogenetic analysis of RVFV : relation with East Africa 1997/98 (*Shoemaker et al 2002*)**

➔ **Samples tested from Tihama Yemen in 1997 all negative: no RVF virus infection before 1998**

Topography of Tihama coast





Outbreaks in Saudi Arabia

➔ Initial cases appeared in ALARDA of Jizan on August 2000

- 11, 000 Sheep, Goats, Cattle and camels dead only in city of Jizan, 65.5% of the animal cases were from Jizan.
- About 26.9% of the animal cases occurred in Asir

➔ Late 2000 RVF cases occurred in MAKKAH

➔ A total of 40,000 livestock dead, destroyed and aborted in KSA
<http://www.fas.org/ahead/disease/rvf/outbreak/2000arabia.htm>

➔ 886 human cases, 123 died : mortality rate 14%
The Outbreak started in September 2000 and ended on April 2001

➔ 2004: 5 sero-positive animal cases was confirmed but no clinical cases
<http://www.promedmail.org> (archive no. 20041003.2723)

➔ 2008: one Suspected human case and some animals sero-positive
<http://www.promedmail.org> (archive no. 20081222.4024)

Outbreaks in Yemen 2000 - 2001

The outbreaks left

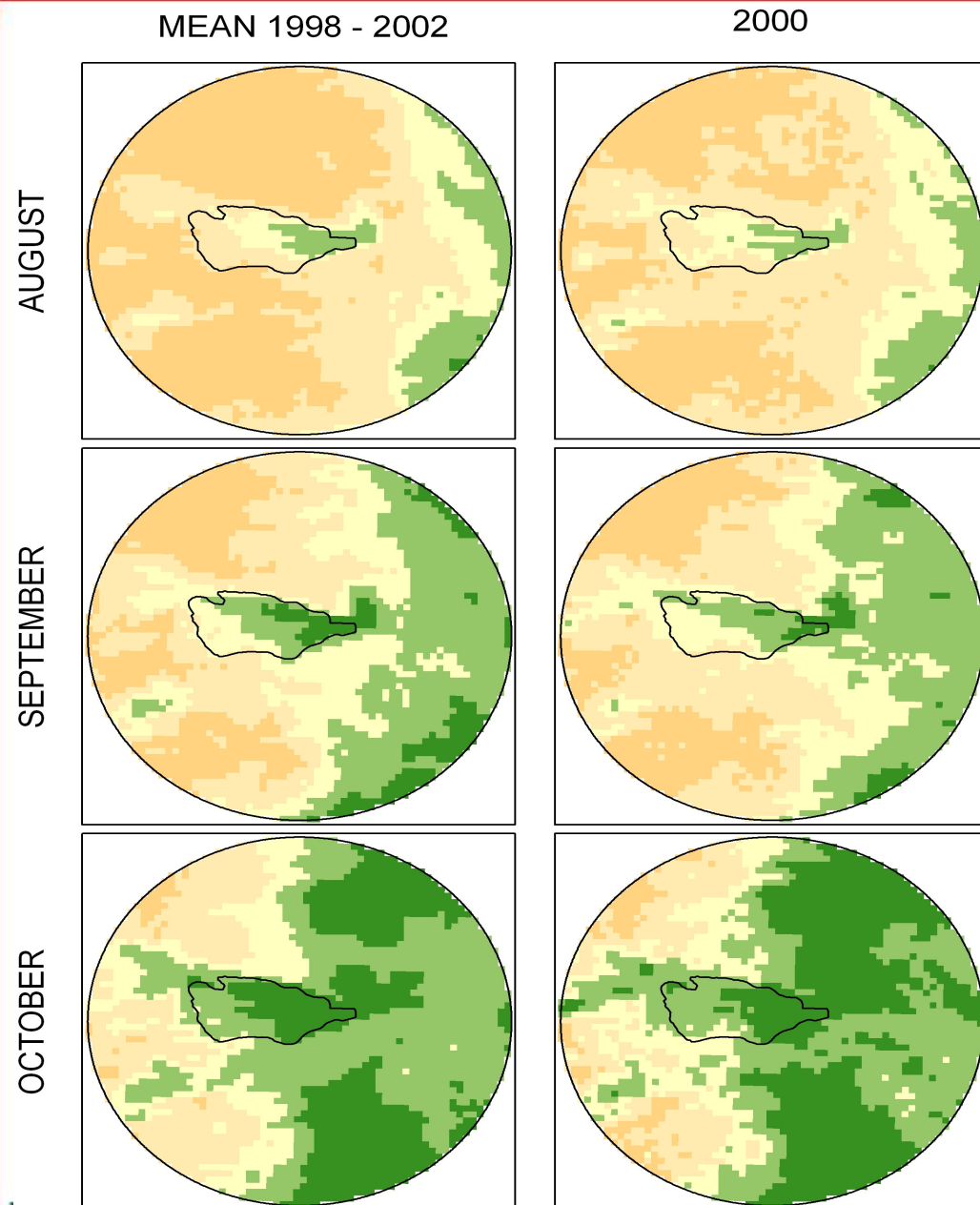
- ➡ About 21,862 abortions
- ➡ About 6,653 deaths of Young animals
- ➡ About 1080 cases 141 died
- ➡ Very heavy socio-economic impact



- There were sporadic sero-positive animal cases with ELISA assay in 2005/06 and 2007.
- But in 2008 no reactive case found

Serum samples tested by ELISA for RVF IgM during 2007

Governorate	Tested Samples for RVF IgM	Pos.	Notes
Taiz (Almocka Quarantine)	1622	7	The positives cases found during the RVF outbreak in Kenya and south Somalia
Alhodayedah	1079	2	
Hajjah	62	1	
Hadramout	46	0	
Total	2809	10	



- Normalized Difference Vegetation Index Value observed in autumn 2000 and an average over the period 1998- 2002 Wadi Mawr Valley Yemen, Tihama
- It show that their is no different between 1998- 2000
- Why the epidemic was in 2000 not 1999 ?

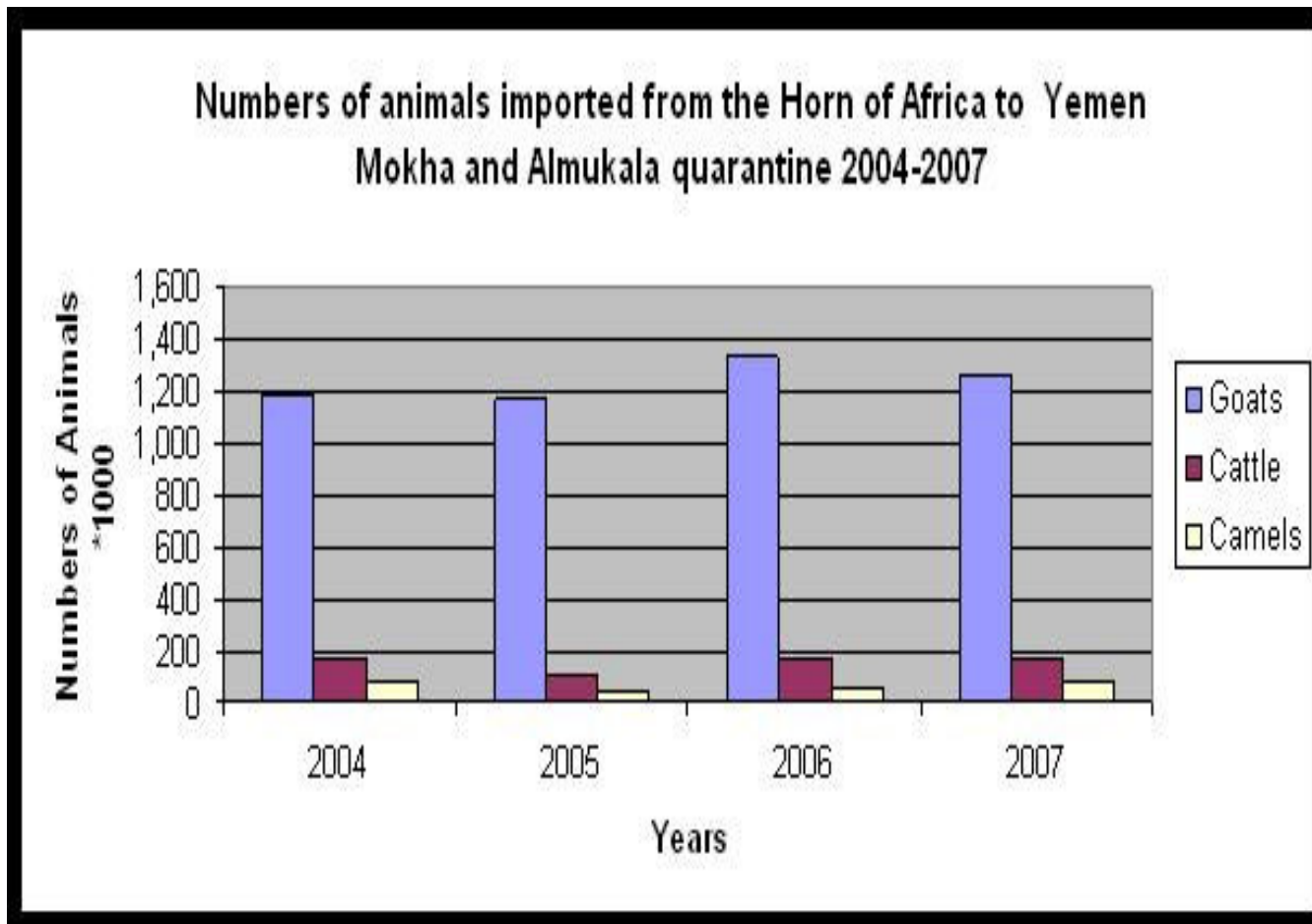


Animal trade movements



- **Livestock trades between the horn of Africa and middle East has long history**
- **10-15 Million live animals exported to Middle East yearly**
- **It brings back about 1 billion USD yearly**

Total numbers of animals legally imported from the horn of Africa Somalia, Ethiopia, Djibouti and Sudan from 2004-2007



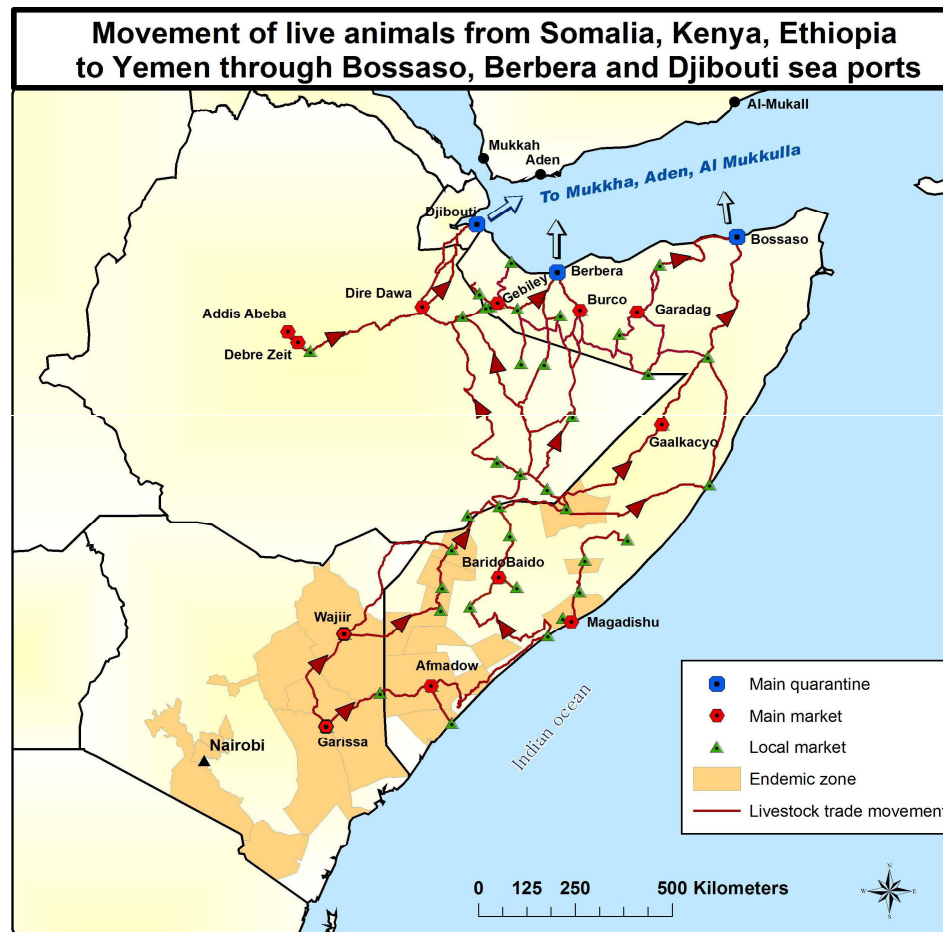
1- 80% of small ruminants imported from Somalia

2- 80% of cattle's from Ethiopia

3- Few thousands of cattle's and small ruminant from Djibouti and Sudan

4- From 1995-2000 the number of Importation increased 643% (USAID 2006)

DESCRIPTION OF TRADE MOVEMENTS



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Risk Assessment of Legal Import

Release parameters	Argument	Scenario 1	Scenario 2
R1 : Behaviour of farmers	Outbreak Prices	High	Low
R2 : Probability to have an infected animal	Prevalence	Very High	Moderate
R3 : Probability to have an viremic animal after transport	Transport duration (2 to 3 days), the incubation (1 to 6 days) and viremia (7 days)	Very High	Very High
R4 : Probability to don't detect the disease at quarantine	Quality of the surveillance system in the quarantine	Djibouti : Low Somalia : Moderate	Djibouti : Low Somalia : Moderate
R5 : Probability to have an viremic animal after quarantine	quarantine duration, the incubation (1 to 6 days) and viremia (7 days)	0 to 5 days High	5 to 10 days Moderate
R6 : Probability to have an viremic animal after transport	Transport duration (1 to 2 days), the incubation (1 to 6 days) and viremia (7 days)	Moderate	Low
R7 : Number of animals involved in the trade	Number of animals involved in the considered period	Very High	Moderate
Release assessment		Moderate	Negligible

Consequences of RVF outbreak






- **1997-98 outbreaks:**
Saudi Arabia ban the importation of livestock's from the horn of Africa.
- **2000-2001 outbreaks in Arabic peninsula KSA & Yemen:**
Gulf states, Saudi Arabia, Bahrain, Oman, Qatar UAE and Yemen ban the importation of livestock's and livestock products from the Horn of Africa
- **End of 2007/beginning of 2008 :**
temporary ban from the horn of Africa in the result of RVF in Kenya, Somalia and Tanzania and Sudan
- **January 2009:**
UAE ban the importation of ruminant from Madagascar due to the RVF outbreak
- **Despite its zoonotic and socio-economic importance no study have been done on the economic impact**

Surveillance & Control

- **Active Surveillance during inter-epizootic period for high risk areas and use of predicting models**
- **Sentinel herd surveillance in High risk area to monitor the virus circulation**
- **Entomological investigation for the principal vectors. Viral isolation and identification particularly during suspected period**
- **Control of vector insects during high risk season**

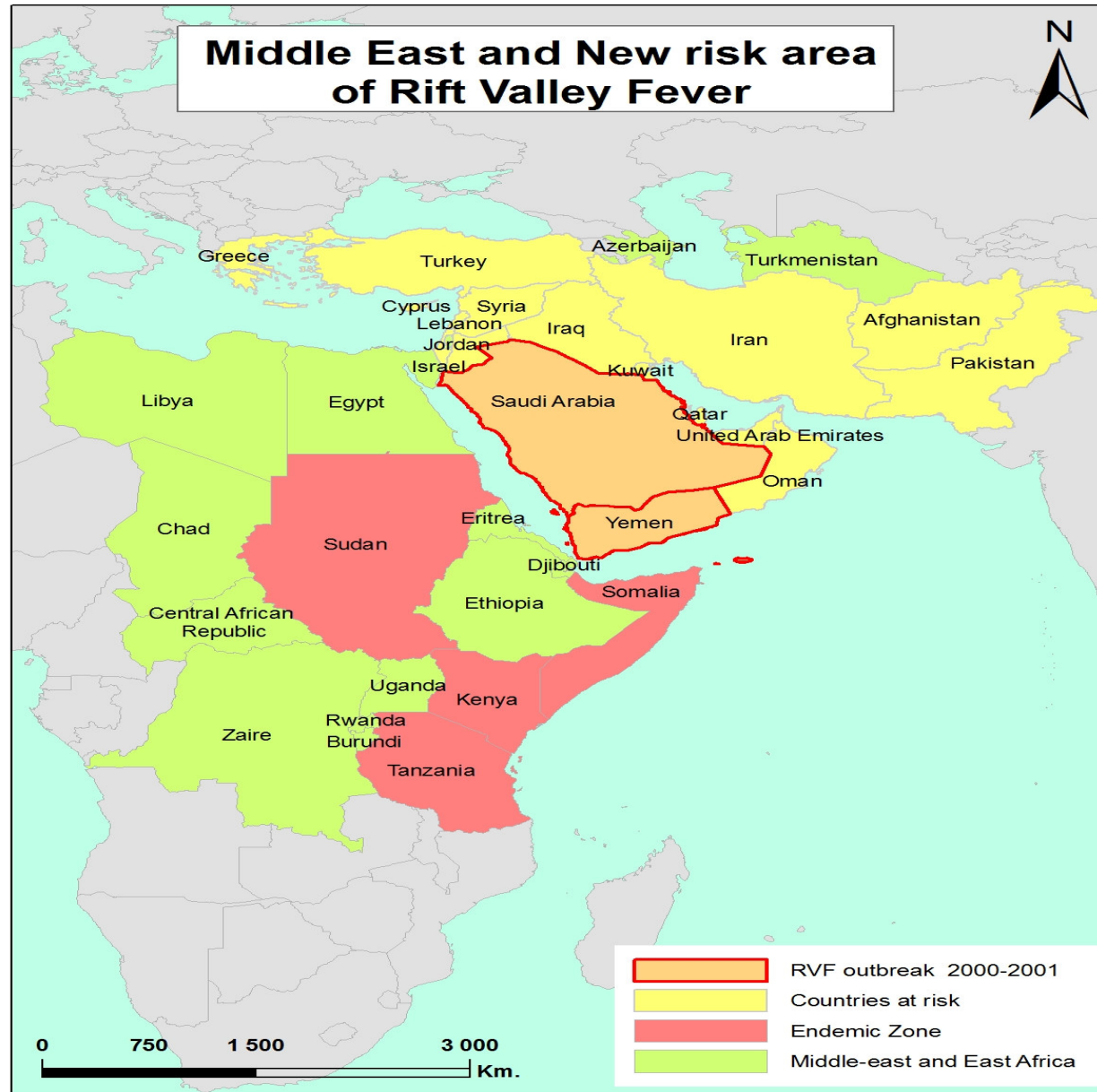
- **Improve diagnostic capacity in the region**
- **Strengthen collaboration between the human health and animal health sectors**
- **Vaccination must be carried out in Pre Epizootic period (before rains) in high risk areas**
- **Blanket vaccination could sometimes lead to viral reassortment and development of virulent viral strain**

Conclusion

-  **The outbreak of 2000- 2001 was in irrigated area of Wadis in Tihama coast**
-  **The disease dynamic in Wadis was not the same pattern with East and west Africa.**
-  **What we are preparing for the future?**
-  **When and where the disease re-emerge in consideration to viral activities and vector insects dynamics and climatic changes from lesson obtained during 2000 to 2009?**
-  **Viral isolation from the vectors should be further studies**

PERSPECTIVES

New risk Areas



Perspective

- **Establishment of RVF regional surveillances network**
- **Establishment of regional reference lab for Rift Valley Fever**
- **Improve the existing quarantine and construction of more specially in exporting and junction zone like Yemen**
- **Application of animals health certificate and pre-exporting vaccination**
- **Strengthen the collaboration in the region in exchange of information**

- **Establishment of Database for the region.**
- **Improve capacity building of regional laboratories with diagnostic capacities and skills,**
- **Establishment of RVF map and climatic model for high risk area in the region.**
- **Improve the reporting system of outbreak to international organization OIE,FAO,WHO**

**THANK YOU FOR
YOUR ATTENTION**

