

National and Regional Capacity for CCHF Laboratory Diagnosis Within EMRO

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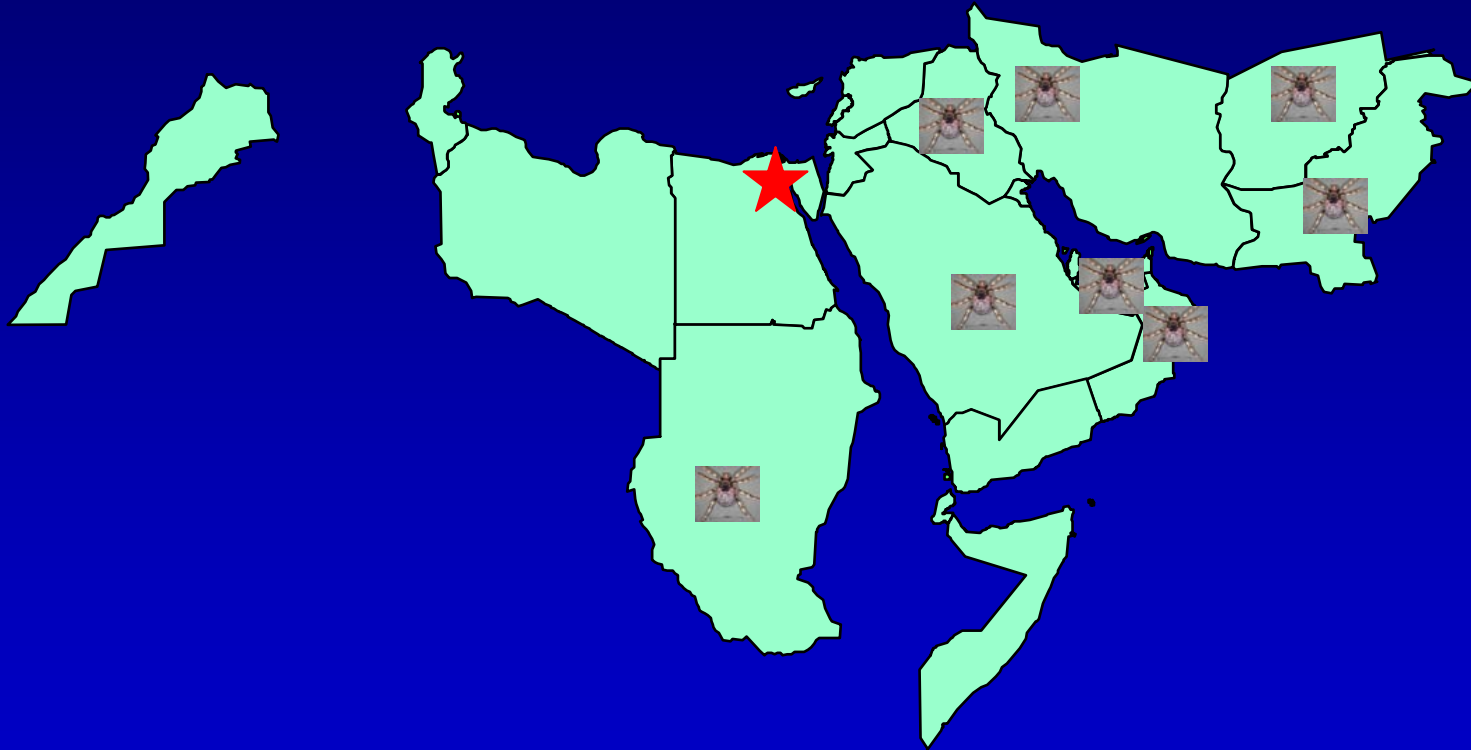


Outline

- Basics of CCHF diagnostics
- Capacity at NAMRU-3 Cairo, Egypt & EMR
- EMRO diagnostic support



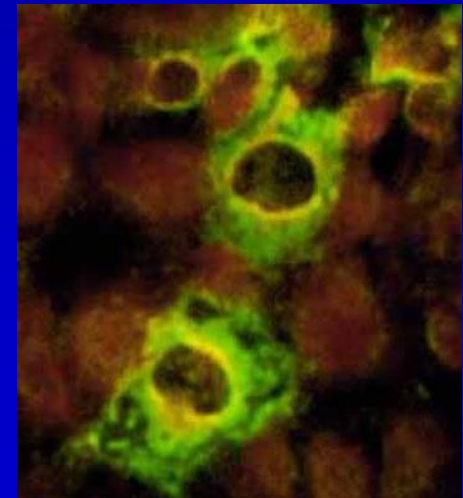
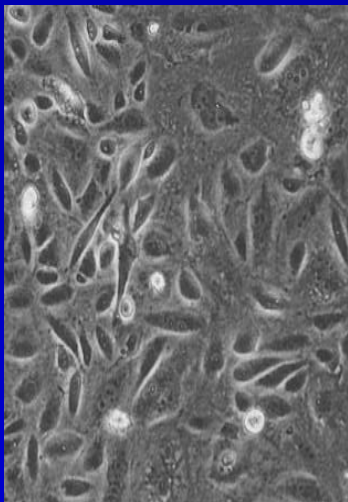
Crimean-Congo Haemorrhagic Fever in EMR



Diagnostic Techniques

(CCHF and other VHF)

- **Virus Isolation**
 - Vero, BHK-21, LLC-MK2, and SW-13
 - Immunofluorescence Assay (IFA)



Biosafety Levels Required for Laboratory Investigations of Haemorrhagic Fever Viruses

Dengue	BSL-2
Yellow Fever	BSL-3
Hantaviruses	BSL-3
Lassa, Jumin, Machupo, Guanarito, Sabia	BSL-4
Rift Valley Fever	BSL-3
Crimean-Congo HF	BSL-4
Ebola, Marburg	BSL-4
TBE Complex (KFD, Omsk)	BSL-4



Diagnostic Techniques

(CCHF and other VHF)

- **ELISA**

- Antigen Capture

- Semi-rapid technique (5-6 hours)
- Requirement of high viral load

- Antibody Capture (approx. day 7)

- IgM detectable < 4 months
- IgG detectable \leq 5 years



Diagnostic Techniques

(CCHF and other VHF)

- **Molecular Diagnostics**

- Conventional RT-PCR (Rodriguez et. al., 1997 and Burt et. al., 1998)
- Real-Time RT-PCR (Garrison et. al., 2003)
 - Requirement for substantial investment (\$50K + support equip)



NAMRU- 3 Capacity

- NAMRU-3 partners with EMRO to support regional diagnostic requirements. BL3/BL4 facility is available on site in Cairo, Egypt
- Similar diagnostic capacity available with both Dr. Sadegh Chinikar (Iran) and Dr. Sohail Zaidi (Pakistan)

Viral Isolation

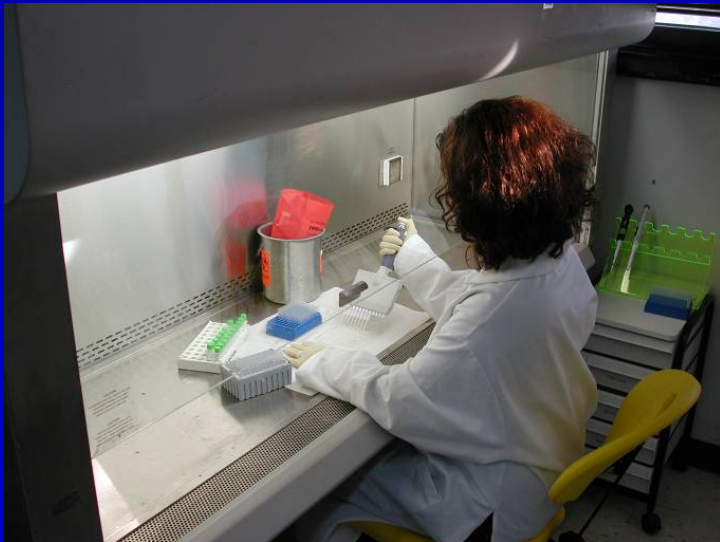
- Viral propagation followed by IFA under BL4 conditions
- Active Biosafety and Cabinet Certification Program



NAMRU- 3 Capacity

ELISA

- CCHF IgM capture ELISA (Vector-Krym, Nova Sebirsk)
- Second IgM capture using reagents from USAMRIID Fort Detrick, MD

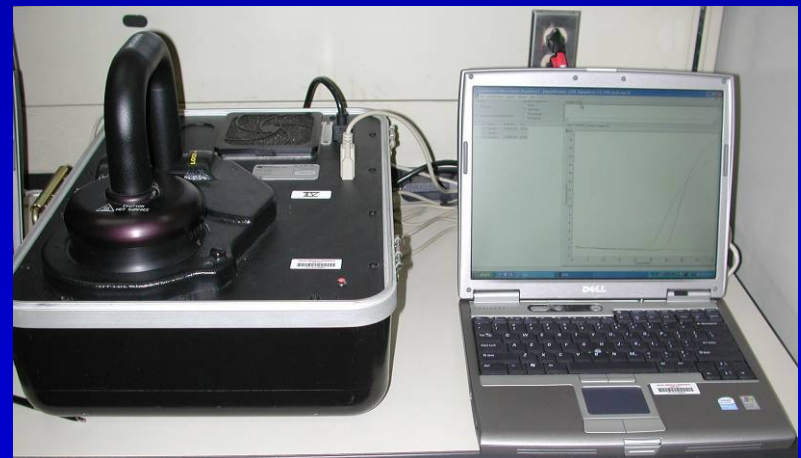


NAMRU- 3 Capacity

Molecular Diagnostics

- Conventional PCR (Rodriguez et. al., 1997 and Burt et. al., 1998)
- Real-Time RT-PCR (USAMRIID - Primer/Probes targeting S segment of genome)

Whitehouse et. al., 2006. Molecular Detection of Crimean-Congo Hemorrhagic Fever Virus in Ticks from Turkey. Am Soc Trop Med Hyg, Atlanta, GA



Goals of Proactive Surveillance

- Provide early and precise information
 - time, location, disease severity, contacts
 - laboratory analysis for etiology
- Predict transmission and guide implementation of control measures
- Link clinical, veterinary, and laboratory surveillance

How does EMRO utilize regional capacity to support national diagnostic interests?



EMRO Support

Lines of Communication

Ministry of Health
Ministry of Agriculture



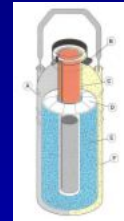
Regional Adviser, Emerging Diseases
Communicable Disease Surveillance,
Forecasting and Response
Regional Office for the Eastern
Mediterranean
World Health Organization



NAMRU-3 Cairo, Egypt

Specimen Movement

Specimen Collection
Patient Information



WHO Pouch



Reporting

Acknowledgements

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