Viral Hemorrhagic Fever (VHF)

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Objectives

- at the end of the lecture, you will have a knowledge about :
- What is the VHF (s).
- Epidemiology of VHF (s)
- Epidemiology of the commonest types of VHF.

What is the VHFs


Ebola Patient (Intensive Care)

- ***VHFs refers to a condition of multi- system "syndrome".***
- ***a wide spectrum of clinical manifestations with varying degrees of severity… WHY?***
- ***The overall vascular system may damage and the body's ability to respond is impaired.***

CAUSATIVE MO:

VHFs are diseases caused by 5 distinct families of viruses.

- **Arenaviruses** ***(Lassa virus, Lujo virus …***
- **Bunyaviruses** ***(Crimean-Congo hemorrhagic fever virus, Rift Valley fever virus, Hantavirus..***
- **Filoviruses** ***(Ebola virus and Marburg ..***
- **Flaviviruses** ***(Yellow fever virus, dengue virus.***
- **Paramyxoviruses** ***(Hendra and Nipah virus).***

"Arbo-viruses": viruses spreads to human by the bite of infected arthropods.

Common characteristics of these Viruses….

- ***RNA VIRUSES***
- ***Naturally are zoonosis..***
- ***Restricted to the geographical areas where the host sp. Live (animals & insects).***
- ***Easier to destroy with heat, sunlight, gamma rays, bleach, detergents, solvents.***
- ***Highly infectious viruses. (low infective dose)***
- ***cure or established drug treatment for VHFs.***
- ***Difficult to prevent VHF Outbreaks since they can occur sporadically and not easily predicted with climate changes.***

Clinical features / VHF

1. ***Initial nonspecific (febrile stage) :***

   high Fever, Malaise, Headache , Myalgia/ arthralgia, Abdominal pain, vomiting, Non-bloody diarrhea

2. ***Clinical multi-system illness associated with:***

- Hemorrhagic manifestations… bleeding Diathesis ..
- Virus specific manifestations; renal failure (hantaviruses), bruises (C-C HF), hearing loss and shock (Lassa fever), Hepatitis (yellow fever), Encephalitis and retinitis (rift valley fever)

Clinical features / VHF

3. Then Progresses to more severe symptoms

- fulminant septic shock,, even death.

What are the indices of disease severity??

1. Multi organ failure cases.
2. high mortality rates

4. Convalescent period of up to 7 wks. and remains contagious through it.

CFR ??

Depend on type & subtypes …

IP:

- USUALLY 1-6 DAYS
- RANGE up to 21 DAYS

INFECTIVITY :

Started from "***PRODROMAL STAGE***" and thereafter …

What is the cause of bleeding in VHF??

Does bleeding in VHF is always life threatening??

Clinical Spectrum of VHF diseases??

VHFs .	Disease in humans	Reservoir	Vector	Geography
Dengue 1,2, 3,4 v.	DHF (fever, Hg, rash)	Monkeys	Mosq.	Throughout tropics
Rift-valley	RVF (fever, Hg, enceph.)	Live-stocks	Mosq.	Africa, Arabia
Yellow F v.	Y.F. (fever, Hg, J)	Monkeys	Mosq.	Africa, S. America
Crimean-Congo v.	CCHF (fever, Hg)	Live-stocks	Ticks	Africa, Asia Middle East
Lassa v.	L.F	Rodents	Rodent excreta	Africa
Ebola v.	E.v. diseases	bats (monkeys?)	Nosocomial (infected bl.)	Africa

Mode of Transmission in VHF

- ***Vector-borne transmission; mosquitoes (Rift Valley fever virus, dengue virus) or ticks (Crimean-Congo hemorrhagic fever virus).***
- ***Contact with infected hosts.***
- ***Excreta of infected rodents.***
- ***Person to person transmission (*direct contact body fluids) as in Ebola, Marburg, Lassa and Crimean–Congo. (*indirect: syringes and needles) Contaminated objects;***
- ***Nosocomial and household transmission ??***
- ***Airborne transmission ??***

Diagnosis of VHF

WHO Case Definition of VHF:

Patient must have one or more of the above characteristic clinical illness with

- ***Important History within 21 days of:***

1. Patient from or travel to endemic areas
2. History of tick, mosquito bites.
3. History of contact with patient with VHF
4. Contact with sick animals or tissues.

Diagnosis of VHF

Investigations :

- *Serological: antigen or antibody detection by ELISA*
- *RT-PCR;*
- *Viral Isolation in Bd or tissues.*
- *Need Specialized Labs*

Treatment of VHF

- ***No specific treatment.***

  Ribavirin; (*Lassa fever, CCHF, RVF*) ***Its action??***

Inmazeb and Ebanga: *Zaire ebolavirus (2020)*

- ***Supportive treatment***: the maintenance of fluid & Electrolyte balance, alleviation of symptoms, mechanical ventilation, dialysis ..
- ***Treatment of Bleeding***: *Fresh frozen plasma, clotting factor concentrates, and platelets, even heparin ??*
- ***Passive AB****... plasma, Whole blood from Ebloa survivors*

Prognosis OF VHFs

Survival depends largely upon:

- ✓ **the virulence of the virus strain and**
- ✓ **the quality of treatment.**

- ***Full recovery (****some) .. Survivors have prolonged convalescence..*
- ***CFR*** *of VHF is 5% -90%. (Dengue HF 5-15%, Ebola and Marburg outbreaks 50% - 90%)*
- ***Disabilities*** *.. Rift Vally HF … Blindness 10%*

  South America HF deafness 25%

Occurrence of outbreak

- ❑ *Sporadic (less fatality rate)*
- ❑ *Epidemic*

Immunity ??

2nd attack is it possible??

Prevention of VHF

1. VECTOR CONTROL :

- vigorous anti-adult and anti-larval measures (e.g., elimination of breeding places)

- Personal protection (repellents, mosquito nets, fumigation mats..)

2. Vaccines administration

- ***Yellow fever (live attenuated 17D vaccine) is only mandatory for travelers to endemic areas of Africa and South America***
- ***Dengue Fever(Dengvaxia), Live attenuated, (one subtype)..***
- Ervebo; Zaire ebolavirus, not marketed

3. International measures ??

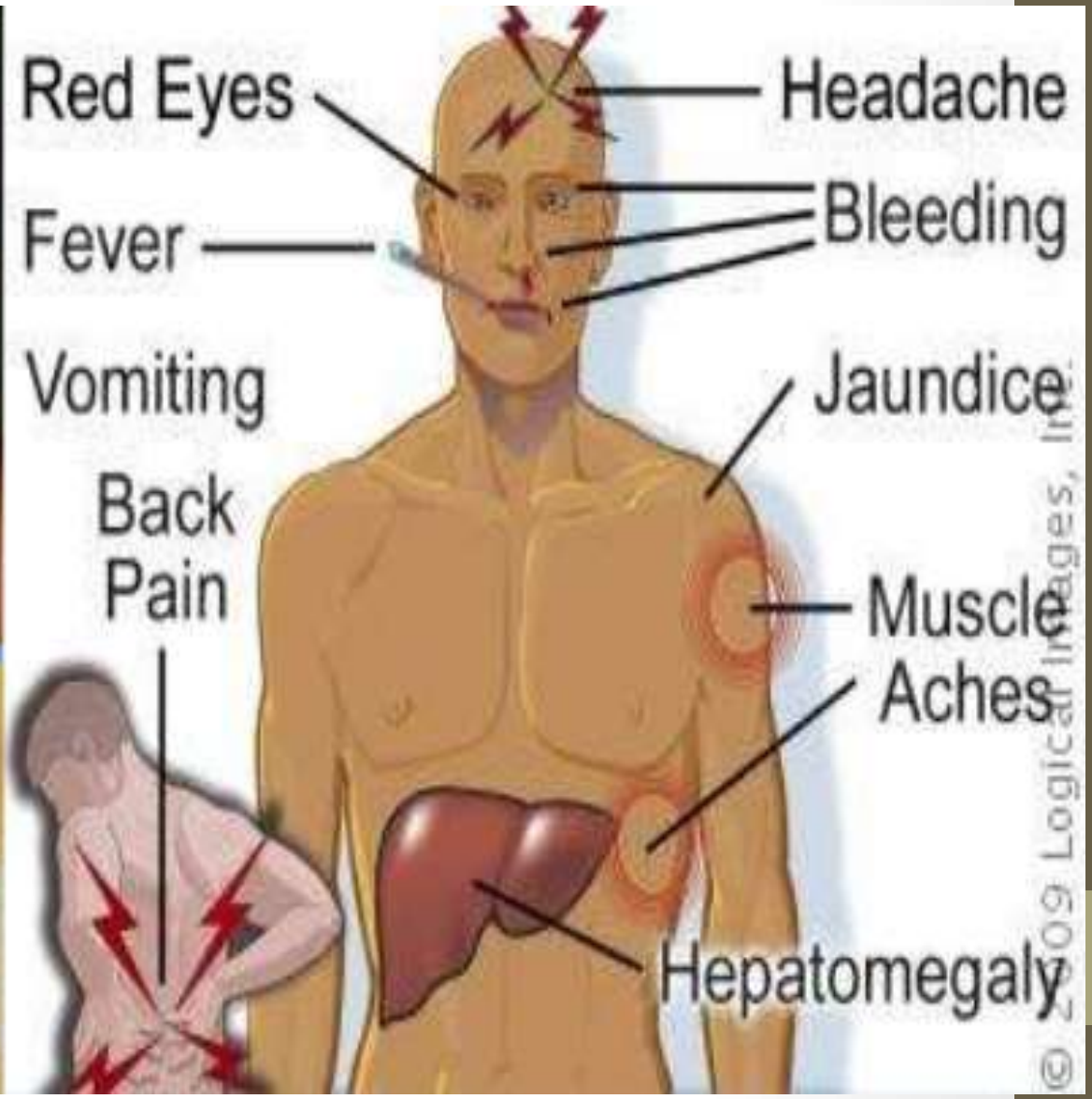
- ***Public Health Measures for Suspected or confirmed VHF cases:***

- Reporting (mandatory)
- Isolation of all suspected cases
- Quarantine of close contacts ??
- Protective measures ..
- Proper hazard labeling, needle precautions ..
- concurrent disinfection ..
- Limited patient-care team.

Nurses in full protective gear in Gabon,

Nurses in full protective gear in Gabon, 2002

Yellow fever



Yellow fever

- 90% of cases occur in Africa, 10% in South America.
- IP=3-6,
- Hepatorenal involvement. Jaundice is common, Majority mild dis
- Mortality rate: 5-10% (20-50% in epidemics). .
- Vaccine give 95% of people Protection for up to 35 years or more.
- Transmission only by mosquito .
- ***Man to man transmission??***
- ***No specific treatment available.***

Dengue H fever

What is wrong here??

Dengue fever

- Described as "**break bone fever**
- 4 sero types, sero-type specific immunity
- ***Humans are the main reservoir***

✓The Most prevalent mosquito-borne viral disease in the world.

✓Endemic in >100 countries throughout of Asia (Arabic Island), Africa, America.

✓ 1/3 of world populations are exposed (100 million cases yearly with 50000 deaths)

Mode of transmission??

✓***Mosquitoes bite, no man to man***

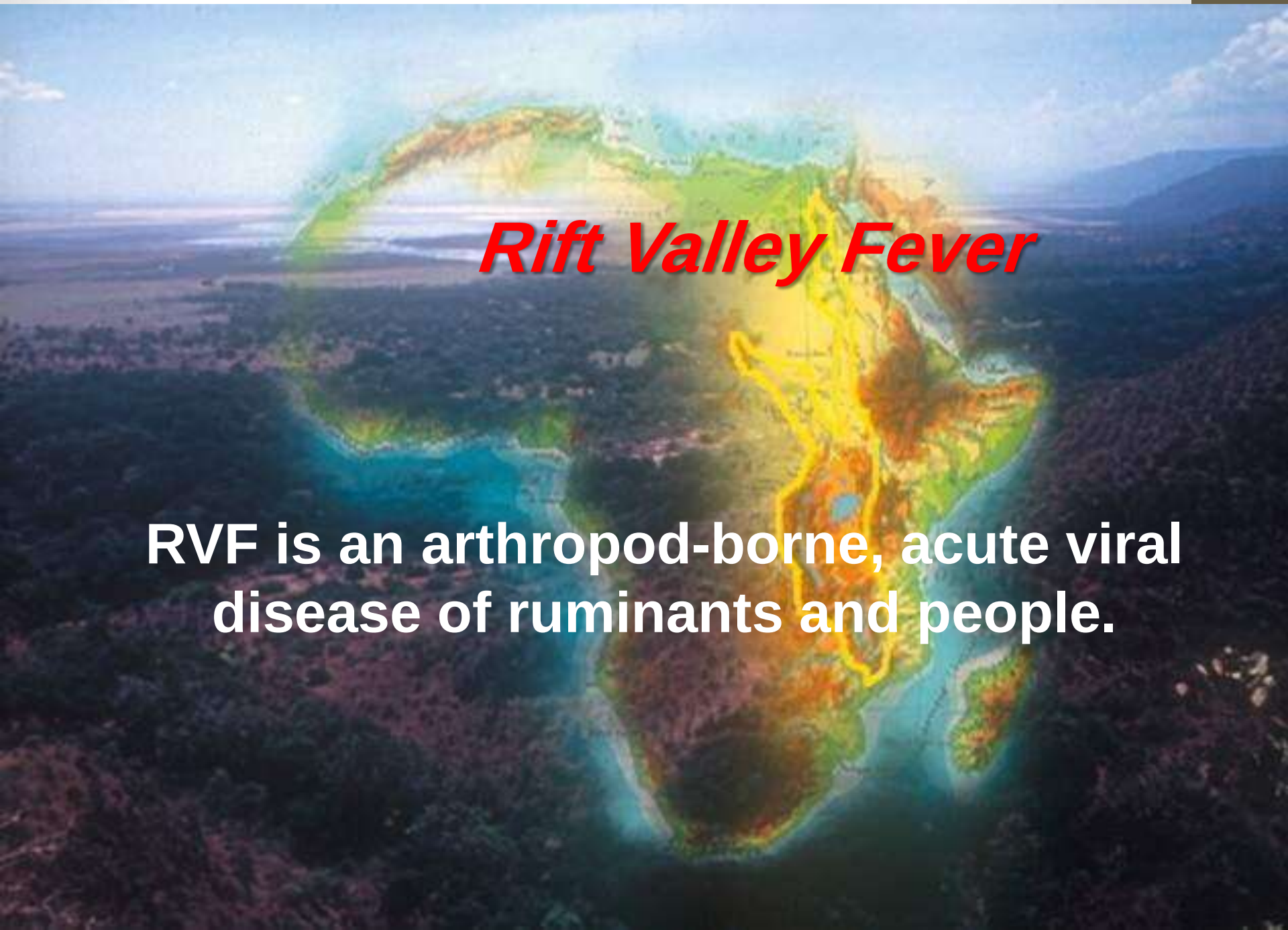
✓***Spectrum: Asymptomatic, (Dengue Fever), DHF.***

Dengue fever

- ✓ In 2021 one version vaccine is available, is CYD-TDV (Dengvaxia), Live attenuated
- ✓ Given for children aged 9- yrs with previous dengue infection (endemic areas). ***WHY?***

- ***A one version vaccine, No full protection***
- ***2nd infection is most dangerous.***

- ***No specific treatment. .***
- ***Fatality rate (5-15%)***



Rift Valley Fever

RVF is an arthropod-borne, acute viral disease of ruminants and people.

Rift Valley Fever

Occurrence

- *1st identified in Rift Valley of Kenya 1931.*
- *Egypt, Saudi Arabia and Yemen.*
- *Spectrum: Sub-clinical , or mild fever and liver abnormality, severe infection with hemorrhage. Retinopathy, meningoencephalitis, loss of vision*
- *Severe HF1%, Mortality ~1% - 50%.*

Reservoir:?

live-stocks and camels.

Vector: ?

Risky groups???

Rift valley fever (RVF)

Mode of transmission:

- *Contact with the tissues of infected animals.*
- *Bites of mosquitoes.*
- *No direct man to man transmission.*

- ***What about Noso-comial ??***

Man-to-man transmission has not been documented

Crimean-Congo Hemorrhagic fever (CCHF)

high fever, severe liver damage, bleeding

CFR: 2% - 50%.

***Occurrence*:**

- ***1st detected in Crimean region (1945) Then in Congo (1960s)***
- ***In Iraq is an endemic (1979).***
- ***last outbreak in 2022, 160 confirmed cases, 27 deaths. CFR: 23.5%***
- ***Iraq, Iran, Turkey, Pakistan, Yemen, India***

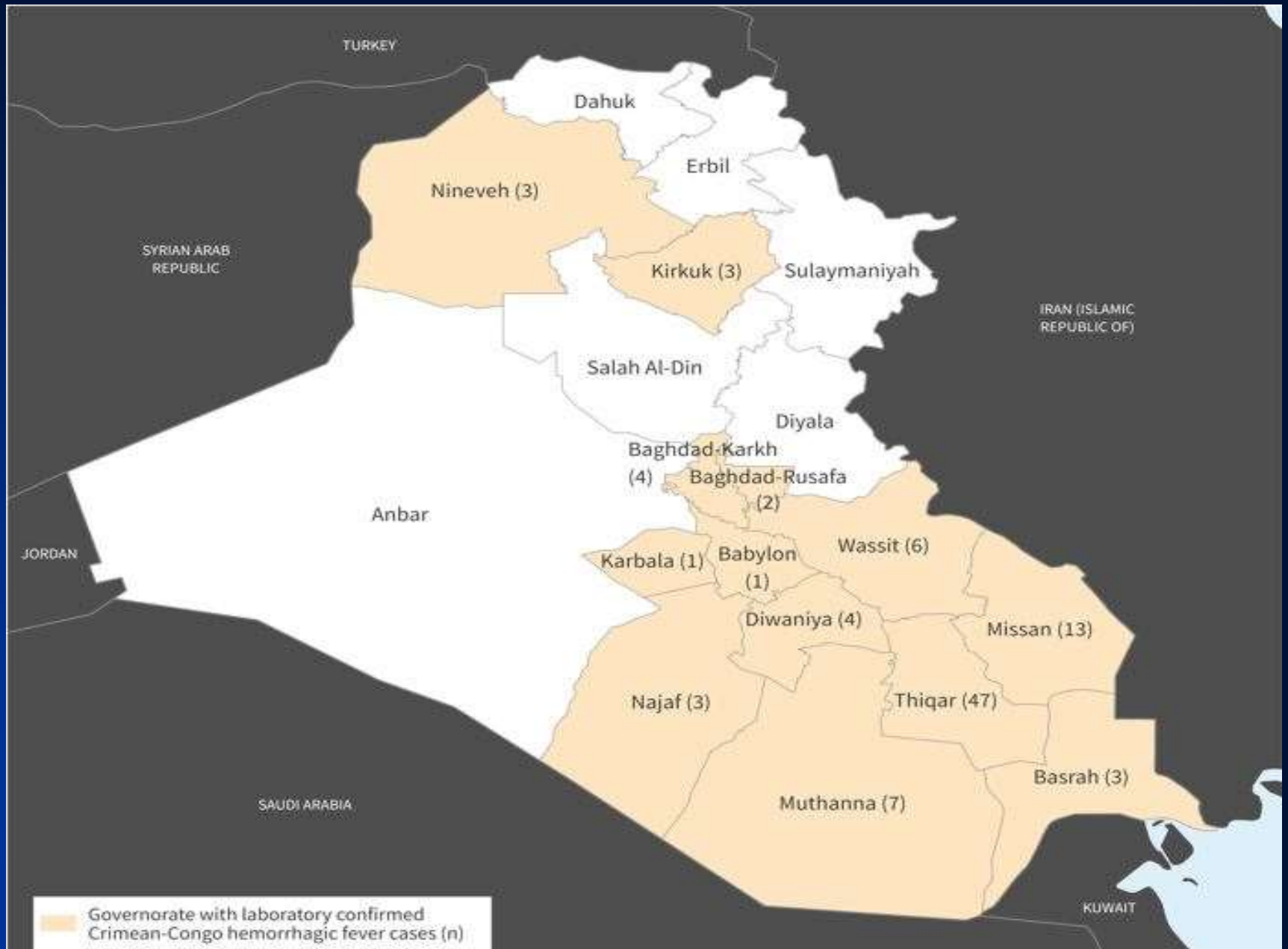
Vectors??

Reservoir ??

***Hyalomma* sp.**

ticks

Distribution of laboratory confirmed cases of C-C H F, Iraq, 2022



Crimean-Congo Hemorrhagic fever (CCHF)

Transmission

- ***Contact with infected ticks***
- ***Contact with animal blood & tissues.***
- ***Human to human .. Contact with infected Bd or body excretions and contaminated fomites & supplies***
- ***Noso-comial infection.***

Prevention

- ***Wearing PPE for animal workers, animal pools.***
- ***Use infection control precautions by health workers.***
- ***Multi-sectors coordination with Surveillance of zoonotic diseases.***

Crimean-Congo Hemorrhagic fever (CCHF)

Challenges against control of CCHF IN IRAQ:

- *The practice of slaughtering animals outside of slaughterhouses. The lack of preventive veterinary activities*
- *lack of animal tick control activities,*
- *lack of human ticks-bite prevention interventions*
- *shortage of specific labs.*
- *Weak case management practices leading to misdiagnosis, late intervention & treatment.*

NO specific Rx… only supportive with ribavirin .

NO vaccine yet

Risk Groups ???

THANK YOU