
INSTITUTE
OF TROPICAL
MEDICINE
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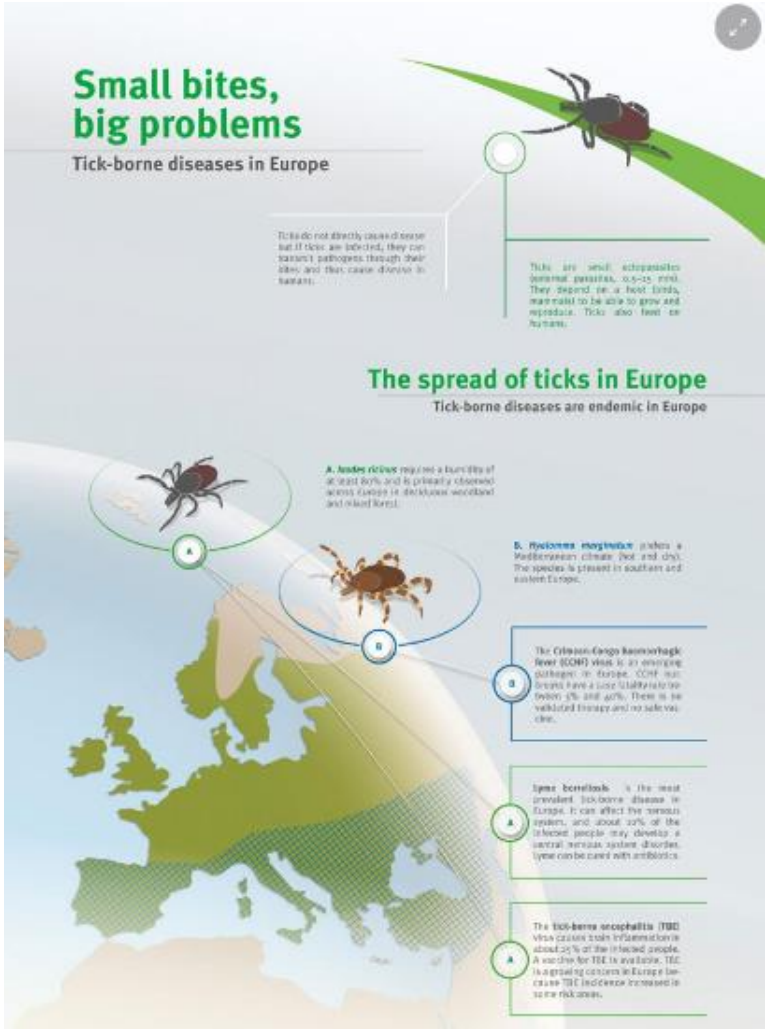
ASCID: Tick Borne Diseases:
Clinical Aspects



DR ULA MANIEWSKI

Pathogens transmitted by ticks

- Lyme (Borrelia Burgdorferi/Afzelii, Garinii)
- Borrelia: Tick Borne Relapsing Fever (TBRL)
- Anaplasma
- Ehrlichia
- Rickettsia: RMSF, MSF, Japanese Spotted fever, TIBONEL, …
- Bartonella
- Babesia
- Tularemia: Francisella tularensis
- Colorado Tick fever
- Hemorragic fevers: Crimean-Congo, Omsk,..
- FSME (Frühsommer meningo-encephalitis) = TBE
- Powassan
- …

A tularemia lesion on the dorsal skin of the right hand

Case 1

- Consultation emergencies
  - man, 61 y old
  - Long and adventourous holiday to Zimbabwe, South Africa, Zambia
  - Fever, chills since 2 days

Case 2

- Man
- Spent 1 month in Portugal
- Visited several natural reserves
- Complaints: fever, myalgia, sick since day of return

Inoculation eschar

inoculation eschars

Rickettsioses

- **General**
  - very small Gram-negative bacteria
  - zoonotic
  - Most transmission via arthropods
  - new species are frequently discovered
  - treatment with antibiotics (tetracyclines)

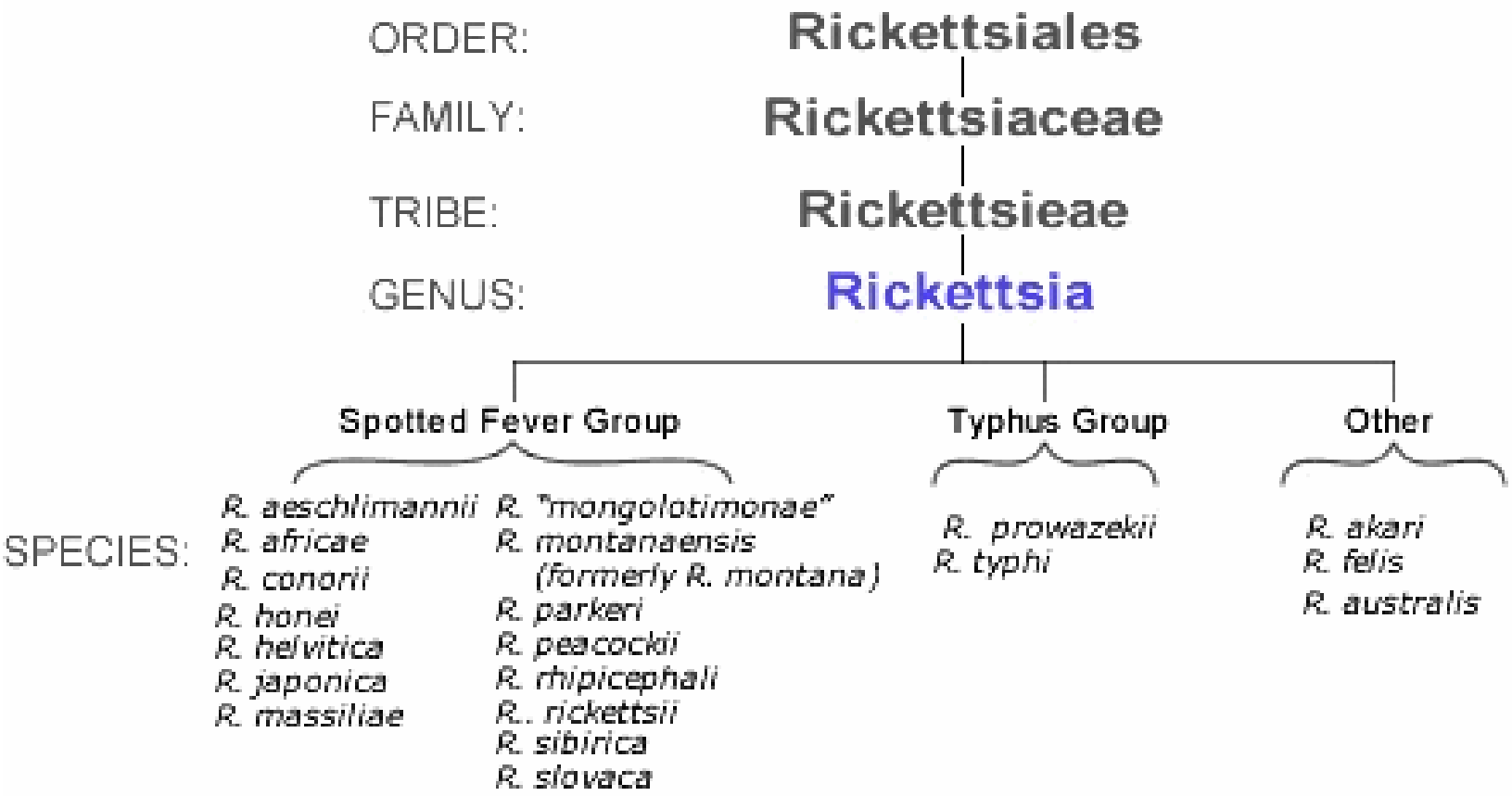
Howard Taylor **Ricketts**

Rickettsia : Transmission

- **Via arthropods**:
  - Body louse: faeces in bite and aerosol
  - Fleas : faeces
  - Ticks : via bite
  - Mites : via bite

Infectious for months

- **Transovarial transmission** in ticks and mites


ORDER:
Rickettsiales
FAMILY:
Rickettsiaceae
TRIBE:
Rickettsieae
GENUS:
Rickettsia
Spotted Fever Group
Typhus Group
Other
SPECIES:
R. aeschlimannii
R. africae
R. conorii
R. honei
R. helvitica
R. japonica
R. massiliae
R. "mongolotimonae"
R. montanaensis
(formerly R. montana)
R. parkeri
R. peacockii
R. rhipicephali
R.. rickettsii
R. sibirica
R. slovaca
R. prowazekii
R. typhi
R. akari
R. felis
R. australis

Often mild to moderate severity

R. typhi (mooseri)	: Endemic typhus	flea	World wide
R. felis	: Californian flea typhus	flea	USA, Europe
R. conorii	: Fièvre boutonneuse	tick	Mediterr, Africa (India?)
R. conorii var.pijperi	: Fièvre boutonneuse	tick	Southern Africa
R. africae	: African Spotted Fever (SF)	tick	Africa, Caribbean
R. sharoni	: Israelian SF	tick	Middle East
R. sibirica	: Nord Asiatic SF	tick	Siberia, Mongolia
R. japonicum	: Japanese SF	tick	Japan
R. australis	: Queensland SF	tick	Australia
R. honei	: Flinders Island SF	tick	Australia
R. mongolotimonae	: Atypical fièvre boutoneuze	tick	Asia, Europe
R. helvetica	: Fluelike illness	tick	Europe
R. slovaca	: insufficient data	tick	Europe
R. aeschlimannii	: Fièvre boutonneuse	tick	Marocco
R. akari	: Rickettsial pox	mite	USA, Africa

Often severe or dramatic course

- *R. prowazekii*	: Epidemic typhus	lice	World wide
- *R. rickettsii*	: Rocky Mountain SF	tick	America
- *O. tsutsugamushi*	: Scrub typhus	mite	SE-Asia, Australasia

Clinical picture

- Incubation 1-3 weeks (average 12d)
  - 8 d for RMSF
- Fever, myalgia, headache, dry cough,
- Maculopapular - petechial skin rash after 2-4 days ("spotted fever")
- Eschar
  - fièvre bouttoneuse, Brasilian RMSF, sometimes scrub typhus
  - Not in RMSF, only 50% in scrub typhus
- Locally swollen lymph nodes
- Splenomegaly

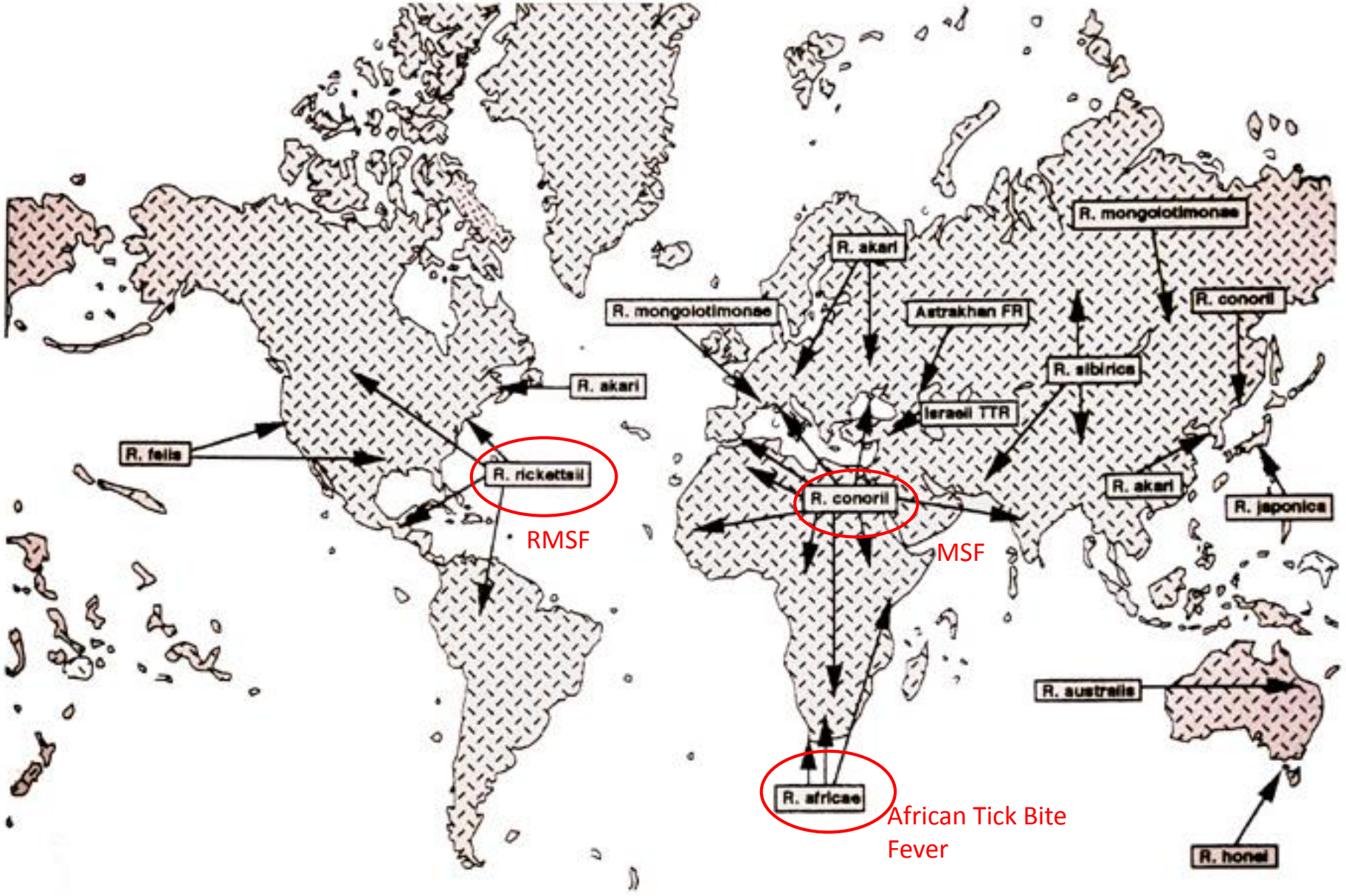
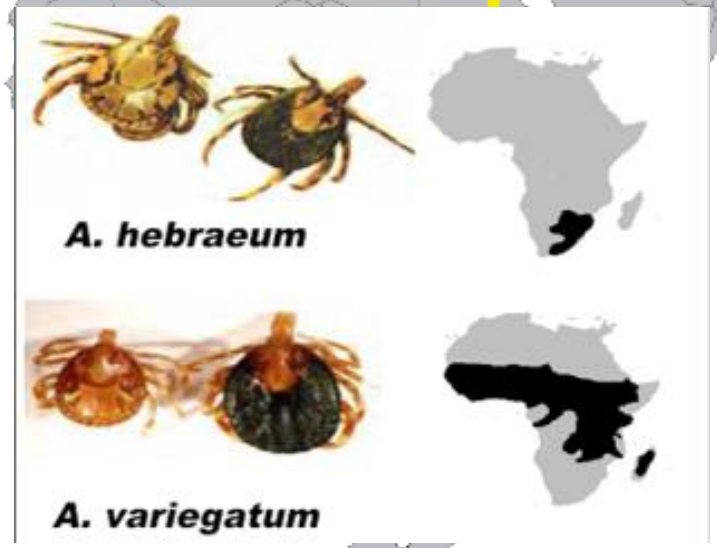


FIG. 7. Geographical distribution of pathogenic rickettsiae.

Tick-borne Rickettsioses, Old World



Distribution of Tick-borne *Rickettsiae*

- *R. africae*
- *R. sibirica sibirica*
- *R. sibirica mongolitimonae*
- *R. aeschlimannii*
- *R. heilongjiangensis*
- *R. conorii conorii*
- *R. conorii israelensis*
- *R. conorri caspia*
- *R. helvetica*
- *R. honei*
- *R. japonica*
- *R. massiliae*

Endemic areas for

- *R. australis*
- *R. conorii conorii*
- *R. conorii indica*
- No data

Last update on: 14/02/2011

Selmi M, Bertolotti L, Tomassone L, Mannelli A. Rickettsia slovaca in Dermacentor marginatus and Tick-borne Lymphadenopathy, Tuscany, Italy. Emerg Infect Dis. 2008;14(5):817-820. https://dx.doi.org/10.3201/eid1405.070976

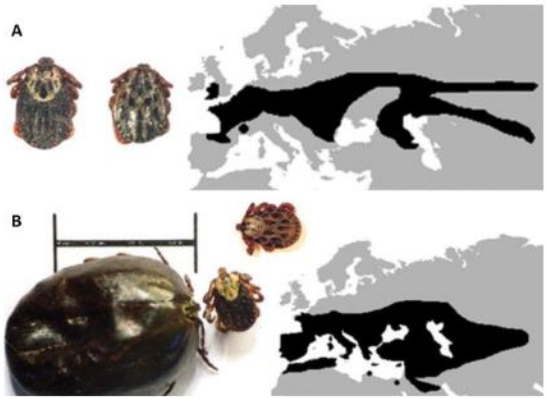
Tick borne lymphadenopathy (TIBONEL)

- Spain, France, Hungary,
- More often in autumn-winter-spring
- Often bite on the scalp
- Eschar
- Fever- lymphopathy- astheny- myalgia-rash

Ticks Tick Borne Dis. 2014 Oct;5(6):656-9. doi: 10.1016/j.ttbdis.2014.04.016. Epub 2014 Jul 8.

Tick-borne lymphadenopathy, an emerging disease.

Silva-Pinto A[1], Santos Mde L[2], Sarmento A[2].



Download full-size image

Fig. 1. (A) *Dermacentor reticulatus* (left hand side: female; center: male; right hand side: distribution). (B) *Dermacentor marginatus* (left hand side: engorged female; center left: unfed female; center right: male; right hand side: distribution; scale bar: 1 cm). *Dermacentor marginatus* is commonly found in Mediterranean areas of Europe and North Africa and *D. reticulatus* in colder areas of western Europe and in the former Soviet Union. From Parola et al. (2009), also at http://wwwnc.cdc.gov/eid/article/15/7/08-1449.htm.

Diagnosis+ treatment rickettsioses

- Think of it!
- Look for rash/ eschar
- Labo: not specific: inflamm-sometimes liverdysfunction-thrombopenia
- PCR on eschar
- Serology
- R/ doxy 100 mg 2/d, 2w

Be Aware of Tick-Borne Relapsing Fever

TBRF is spread through the bite of soft ticks, which feed very quickly and painlessly. Above, a soft tick before and after feeding (not to scale).

For more information about TBRF, visit www.cdc.gov/relapsing-fever/

What is tick-borne Relapsing Fever (TBRF)?

Tick-borne relapsing fever (TBRF) is a rare infection linked to sleeping in rustic cabins, particularly cabins in mountainous areas of the western United States. The main symptoms of TBRF are high fever (e.g., 103° F), headache, muscle and joint aches. Symptoms can reoccur, producing a telltale pattern of fever lasting roughly 3 days, followed by 7 days without fever, followed by another 3 days of fever. Without antibiotic treatment, this process can repeat several times.

How do you get TBRF?

The bacteria that cause TBRF are transmitted by certain types of ticks, called "soft" ticks (see photo) that live in the nests of squirrels, chipmunks, and other small animals. People become exposed when they sleep in cabins and other rustic buildings in which rodents have built nests. These nests are usually located inside the walls or in the attic or crawl space. Soft ticks emerge at night and feed briefly, like bed bugs. Because the bites are quick and painless, most people do not know that they have been bitten.

What should I do if I think I may have TBRF?

Call or visit your healthcare provider. Explain your symptoms and your concerns.

How is TBRF diagnosed and treated?

TBRF is usually diagnosed by examining a sample of blood under a microscope. Other blood tests are available but require that the patient has been sick for several weeks. TBRF is treated with antibiotics. Your healthcare provider will need to monitor you during the first dose of antibiotics in case of a bad reaction. Although deaths are very rare, TBRF can be a particularly serious disease for pregnant women and the elderly.

What can I do to prevent TBRF?

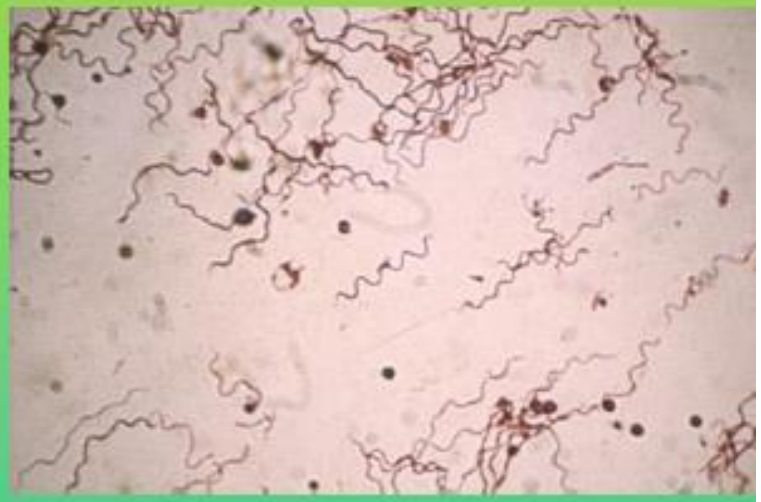
- Avoid sleeping in rodent-infested buildings whenever possible. Although rodent nests may not be visible, other evidence of rodent activity (e.g., droppings) are a sign that a building may be infested.
- Prevent tick bites. Use insect repellent containing DEET (on skin or clothing) or permethrin (applied to clothing or equipment).
- If you are renting a cabin and notice a rodent infestation, contact the owner to alert them.
- If you own a cabin, consult a licensed pest control professional who can safely:
  - Identify and remove any rodent nests from walls, attics, crawl spaces, and floors. (Other diseases can be transmitted by rodent droppings—leave this job to a professional!)
  - Treat "cracks and crevices" in the walls with pesticide.
  - Establish a pest control plan to keep rodents out.

National Center for Emerging and Zoonotic Infectious Diseases
Division of Vector Borne Diseases

CS260766

Recurrent fever – Borreliosis

- Very thin spiral-shaped bacteria
- Two clinical forms:
  - ✓ Epidemic (body lice)
    - ✓ **Humans** are reservoir
  - ✓ Endemic (soft ticks)
    - ✓ **Rodents** are reservoir



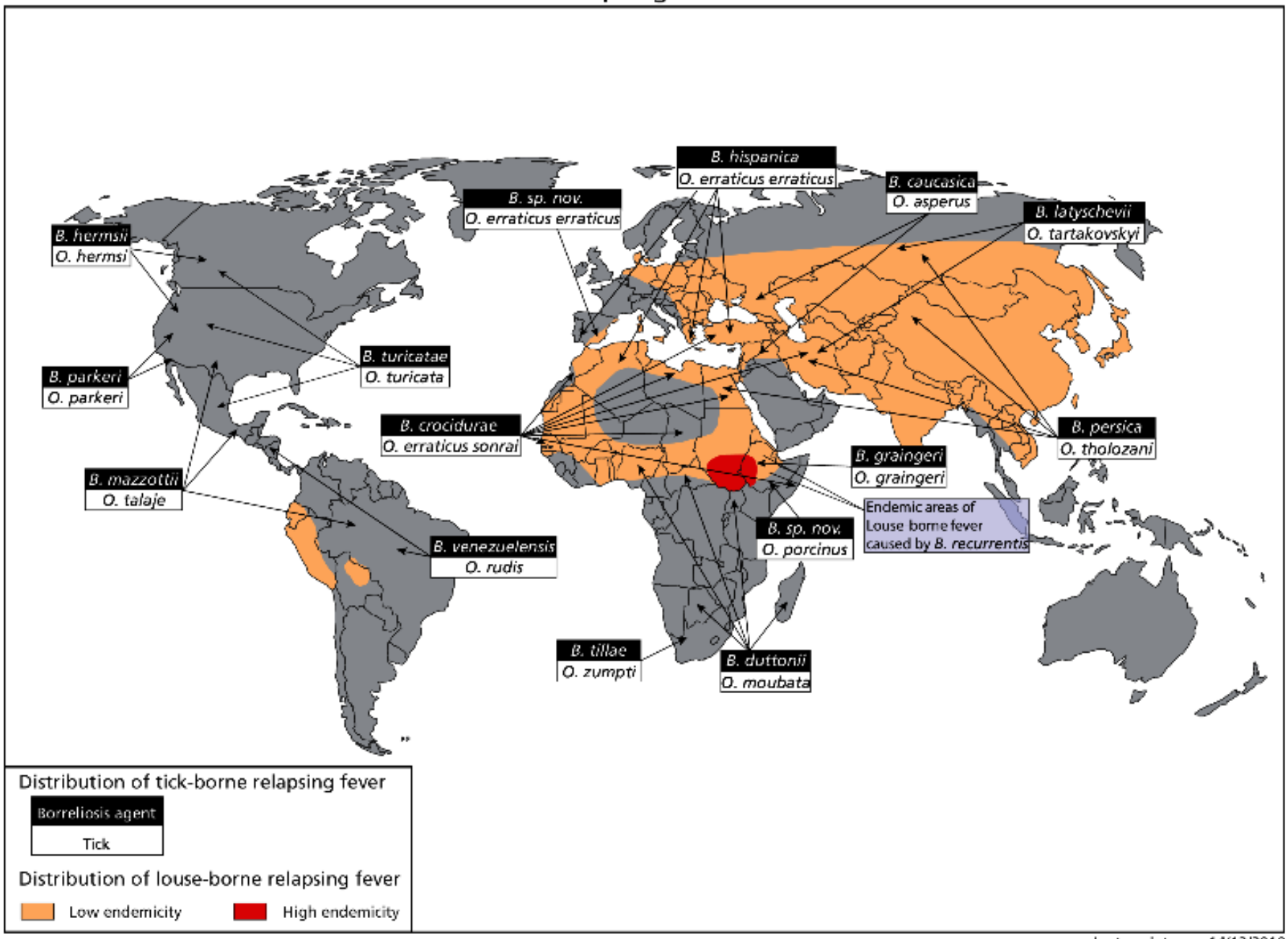
O. hermsi tick, before and after feeding. Photo taken by Gary Hettrick RML, NIAID.

Treatment recurrent fever

- Doxycycline (penicilline is less efficacious)
- Jarish-Herxheimer reaction may be cause of complications!
- Steroids not very useful
- IV-fluid
- Symptomatic (e.g. O_2 and inotropics)

Instituut Tropische Geneeskunde

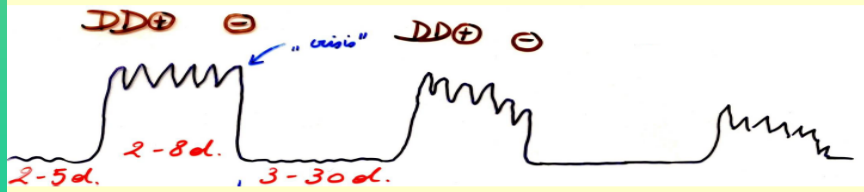
Relapsing Fever



Last update on: 14/12/2010

Relapsing fever: Clinical presentation

- Sporadic
- Incubation 1 week
- Sudden onset fever
  - ✓ Recurrent fever
- Malaise, headache
- Myalgia, arthralgia
- Red eyes
- Discrete rash
- Symptoms worse at the end of febrile episode



les *Borrelia* subissent des variations antigéniques

qui leur permettent d'échapper aux réactions immunitaires établies contre la structure antigénique antérieure

Recurrent fever: Complications

- Myocarditis, dyspnea, dry cough
- Abdominal pain, diarrhea, subicterus
- Hepatosplenomegaly, swollen LN
- Aseptic meningitis
  - ✓ residual facial paralysis
  - ✓ Deafness
  - ✓ N. III-IV-VI lesions (strabism)
- Bleeding tendency, DIC
- Abortion and preterm labor (50%)
- Mortality
  - ✓ epidemic form: 30-80%
  - ✓ Endemic form: 2-5%
  - ✓ Neonatal: 50%

Instituut Tropische Geneeskunde

Crimean Congo Hemorrhagic Fever

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Iran reports 120 CCHF cases in six months, Tehran spared so far

by NEWS DESK

September 29, 2017 | Headlines, Middle East | No Comments | 2372 views

Turkey: +/- 10 000 cases-CFRR almost 5%

One Dead, One In Isolation After Two Cases Of Crimean-Congo Hemorrhagic Fever Confirmed In Madrid

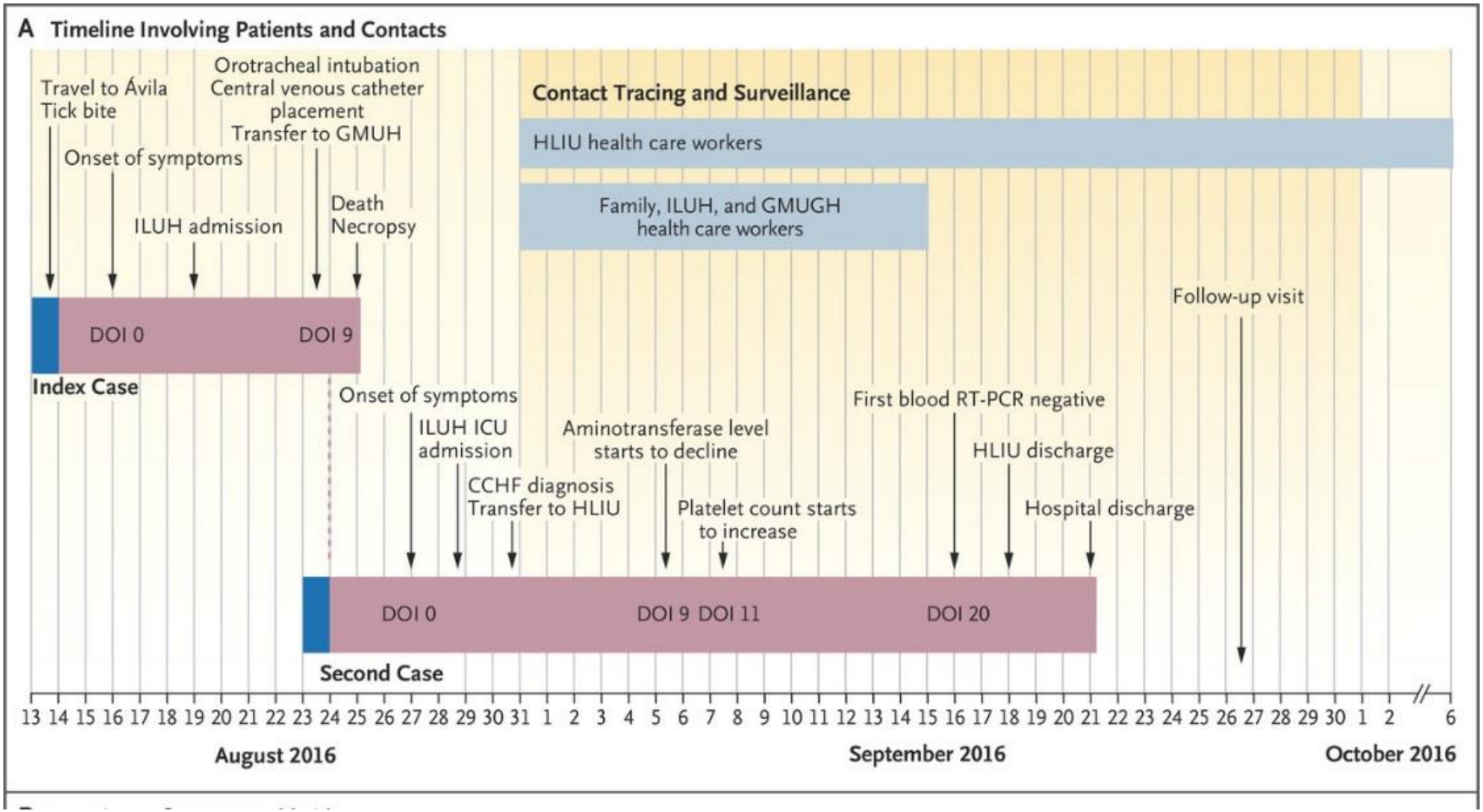
***Sep 01 2016—NEWS—200** people who came into contact with the infected patients are being checked, and some confined to their homes.*

Crimean-Congo HF

- CCHF virus : family Bunyaviridae, genus Nairovirus
- 1944-45 (Crimean HF), 1956 (Congo HF), 1967 : identical => CCHF
- Zoonosis in wide range of wild / domestic vertebrates, incl small mammals, cattle, sheep, goats, ostriches
- Enzootic in sub-Saharan Africa, Middle East, rare elsewhere (Albania, Kosovo)
- Occasional epidemics

- Transmission via
  - Ticks, esp. *Hyalomma* sp. - transovarial and venereal in
  - Larvae bite viremic small mammals
  - Direct contact with blood / tissue of livestock
  - Nosocomial : aerosol

Clinical Events and Locations: CCHF in Spain



Crimean-Congo HF

- Incubation period ±3 d after tick bite, ±6d after blood / tissue contact (max 13d)
- Sudden onset fever, flu-like illness, GBP, confusion, lethargy,
- Severe hepatitis, bleeding, hepatorenal and pulmonary failure, no meningitis
- Case fatality rate 30%, death in 2th week of illness

CCHF: Diagnosis

Diagnosis via virus isolation, PCR, ELISA

Isolation pt, barrier nursing (nosocomial: airborne possible)

Treatment : ribavirin + supportive

?? value convalescent plasma

No safe vaccine available

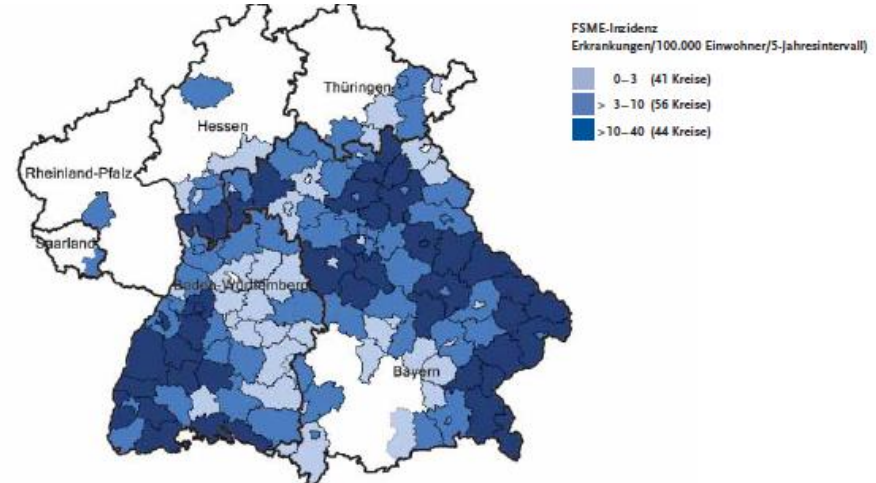
Gloves + protective clothing when handling animal tissues in endemic areas

Ticke Borne Encephalitis (TBE-FSME)

RAPID COMMUNICATIONS

First human case of tick-borne encephalitis virus infection acquired in the Netherlands, July 2016

JA de Graaf [1], JHJ Reimerink [2], GP Voorn [3 4], EA bij de Vaate [5], A de Vries [2], B Rockx [2], A Schuitemaker [1], V Hira [4]



Tick Borne Encephalitis (TBE-FSME)

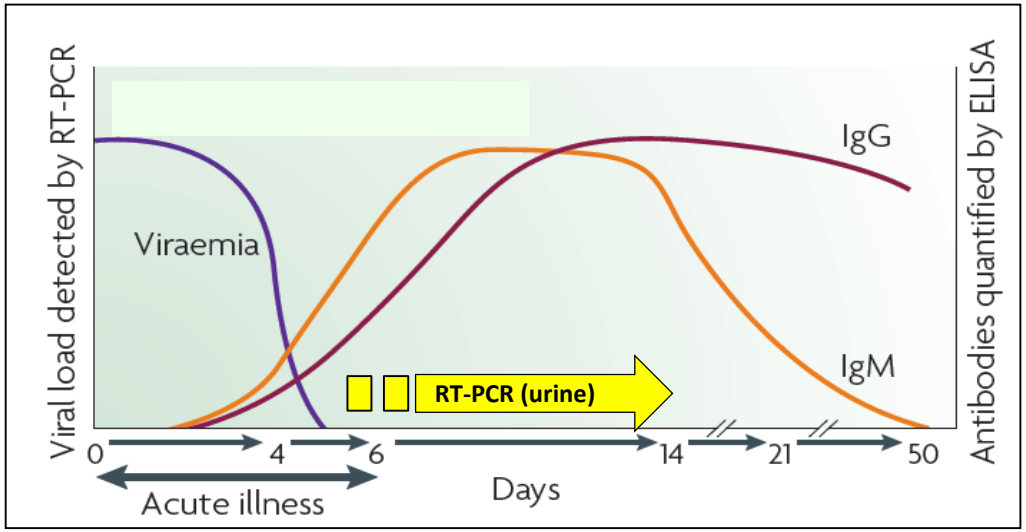
- Flavivirus
- 3 subtypes:
  - European subtype, transmitted by *Ixodes ricinus* ticks, endemic in rural and forested areas of central, eastern and northern Europe;
  - Far eastern subtype, transmitted mainly by *I. persulcatus*, endemic in far-eastern Russia and in forested regions of China and Japan; and
  - Siberian subtype, transmitted by *I. persulcatus*, endemic in Urals region, Siberia and far-eastern Russia, and also in some areas in north-eastern Europe

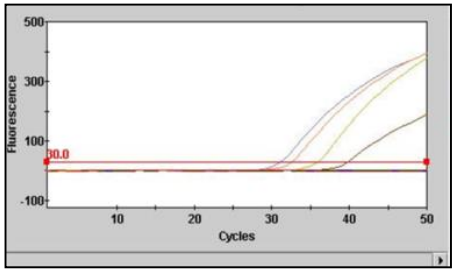
Clinical features

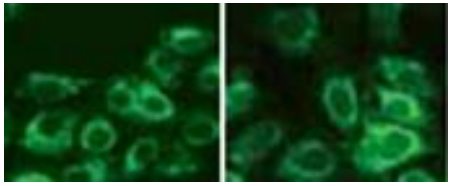
- Biphasic:
  - First: aspec symptoms (flu like)
  - Asymptomatic interval (1 to4 w)
  - Second phase: neurological symptoms (meningitis, radiculitis, encephalitis, myelitis…)

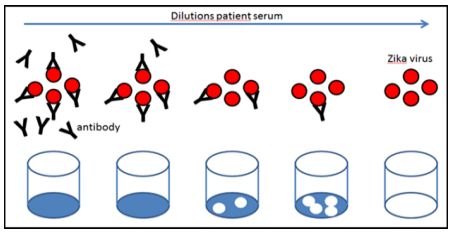
  - Sequellae+ severity depend on
    - Age
    - Subtype:
      - European: 30% have second phase, 10 sequellae
      - Far East: often 1phase, 30 mortality rate

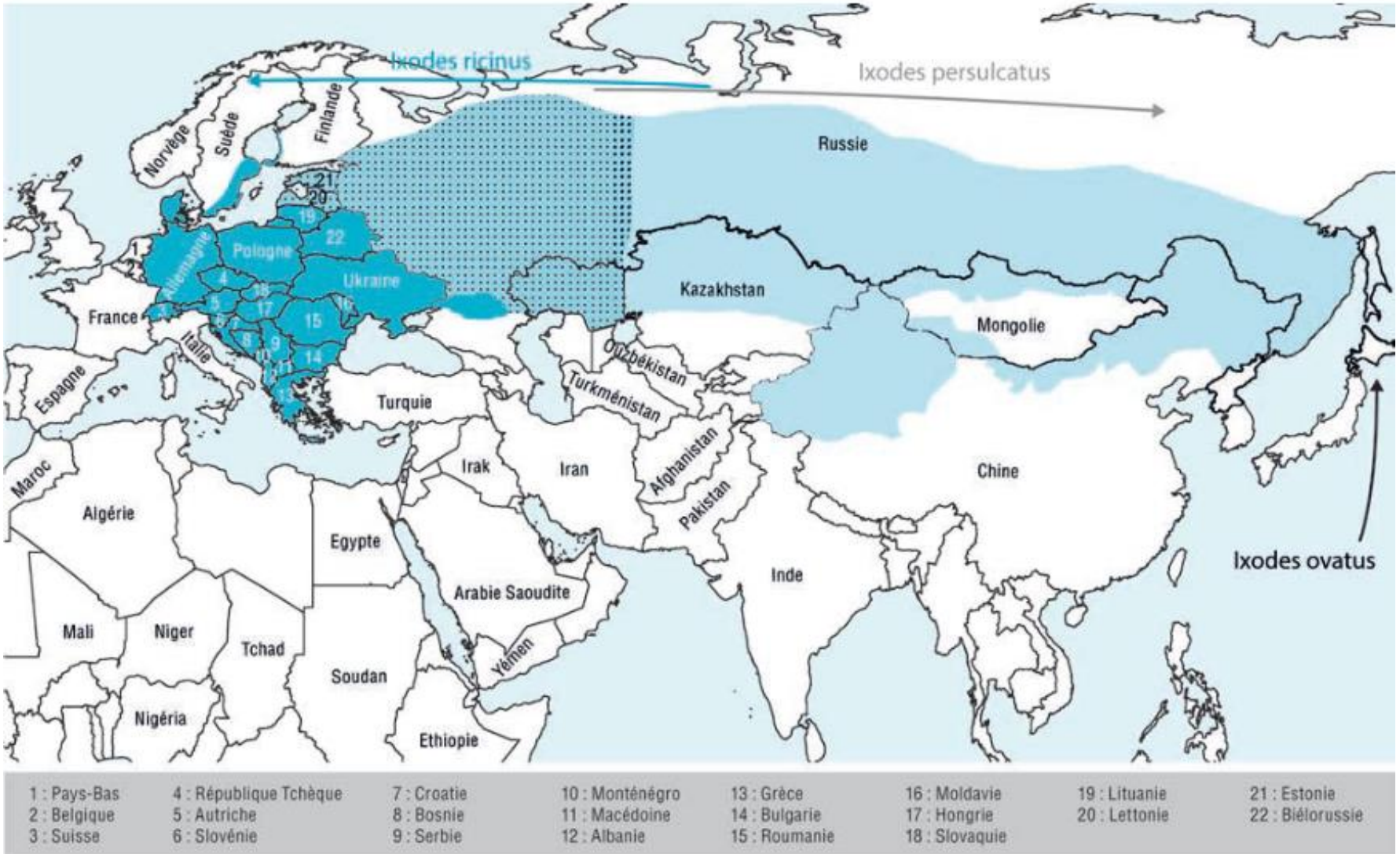
Laboratory diagnosis of TBE









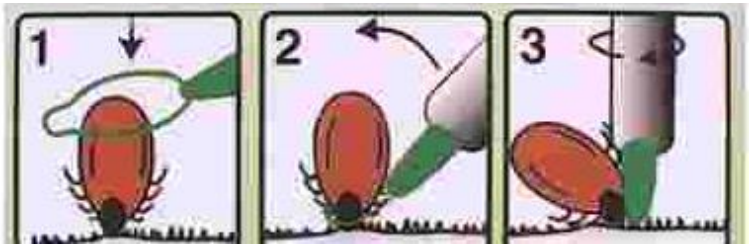


1 : Pays-Bas
2 : Belgique
3 : Suisse
4 : République Tchèque
5 : Autriche
6 : Slovénie
7 : Croatie
8 : Bosnie
9 : Serbie
10 : Monténégro
11 : Macédoine
12 : Albanie
13 : Grèce
14 : Bulgarie
15 : Roumanie
16 : Moldavie
17 : Hongrie
18 : Slovaquie
19 : Lituanie
20 : Lettonie
21 : Estonie
22 : Biélorussie

@SMV

Hoe zich beschermen tegen tick borne diseases?

- Geïpregneerde kleding
- Insectenrepellent op niet bedekte delen van de huid
- Kousen over broekspijpen trekken
- Huid regelmatig op teken controleren
- FSME: Vaccin beschikbaar



TBE vaccin

- FSME junior® (0.25ml) van 1-16j prijs ~29,60€
- FSME Adult® (0.5ml) prijs ~34,50€

- Schema: $M_0 – M_{1-3} – M_{9-12}$
- Versneld schema: $D_0 – D_{14} – M_{9-12}$
- Booster na 3 jaar en erna om de 5 jaar (bij >60j om de 3j)

Dr Ula Maniewski

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