

Emerging import infections in neurology

Leïla Belkhir, MD, PhD

Mathilde Berghmans, MD

BNS symposium 7 DEC 2019



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The exponential increase in travelling has major consequences on the epidemiology of infectious and postinfectious diseases, constituting a global public health challenge

Zika virus epidemic in Latin America that has now spread to 84 countries globally



The increase of unvaccinated people permits outbreaks of some re-emerging diseases through communities

Outbreak of measles in Europe



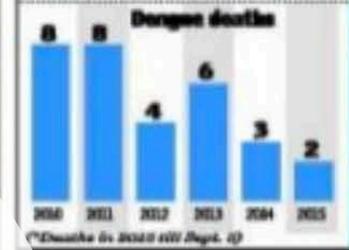
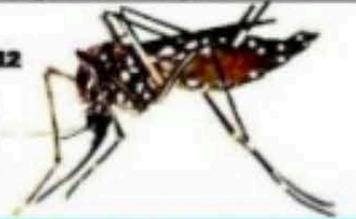
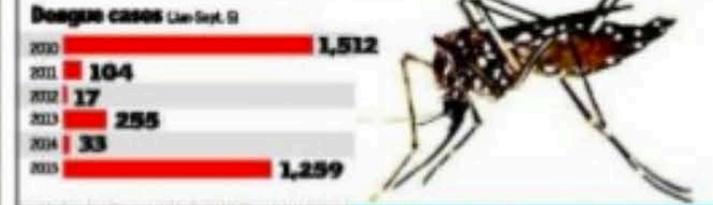
Climate changes are strong environmental drivers of vector-borne disease transmission (with the expansion of the geographic range of permissive vectors)

Outbreak of WNV in Europe (Greece, Romania) via *Culex*, Zika Virus in South America



HEALTH ALERT

Delhi has witnessed an alarming rise in dengue cases



The number of dengue cases is likely to increase for a few more days. As the season has started becoming dry, mosquito breeding will recede. Once the breeding stops, the dengue cases will be lower



DENGUE-YELLOW FEVER EPIDEMIC POSSIBLE

Arbovirus

- Arbovirus = various RNA viruses that are transmitted by arthropods
- Different types of Arboviruses
 - **Flavivirus:** YF, WNV, ZKV, Dengue, Japanese Encephalitis, St-Louis encephalitis
 - **Togavirus:** Eastern equine encephalitis, chikungunya
 - **Bunyavirus:** Sandly fever, Crimean Congo Haemorrhagic

Outbreaks of Dengue Fever Worry

Several spots facing worst flare-ups in Devidas; Hong Kong Concerned After Flooding Locally

Health officials in the state are warning of a possible dengue fever outbreak in several parts of the state. The state health department has issued a warning to the public to take precautions against mosquito bites.

The state health department has issued a warning to the public to take precautions against mosquito bites. The state health department has issued a warning to the public to take precautions against mosquito bites.



Slum kids take to streets to spread dengue awareness





Case



- 45-year-old Belgian returning from Germany
- Admitted to hospital in Belgium with a flu-like syndrome, nausea, vomiting that had started two and a half weeks earlier
- Moxifloxacin started by GP
- During hospitalization, she developed confusion, encephalopathy with dyskinesia of the limbs (tremor) and tongue.
- CT and MRI scans of the head were normal.



- Cerebrospinal fluid (CSF) testing showed
 - 169 WBC/ μ l with a lymphocytic predominance.
 - CSF glucose was normal
 - but CSF's lactic acid, protein and albumin were elevated
- Empirical treatment with ceftriaxone was started

Hypotheses

1. Dengue
2. West Nile Virus Infection
3. Japanese encephalitis
4. Herpes encephalitis
5. Tick-borne encephalitis

- TBEV antibodies (both IgM and IgG) by immuno-fluorescence assay were detected.

Confirmation of Tick-Borne Encephalitis

Tick-borne encephalitis

Genus: flavivirus,
Family Flaviviridae

Transmission: *Ixodes spp* ticks,
unpasteurised milk

Geography: from western Europe to
the eastern coast of Japan

Season: spring to autumn

> 10.000 cases every year
worldwide

3000 cases in **Europe** every year

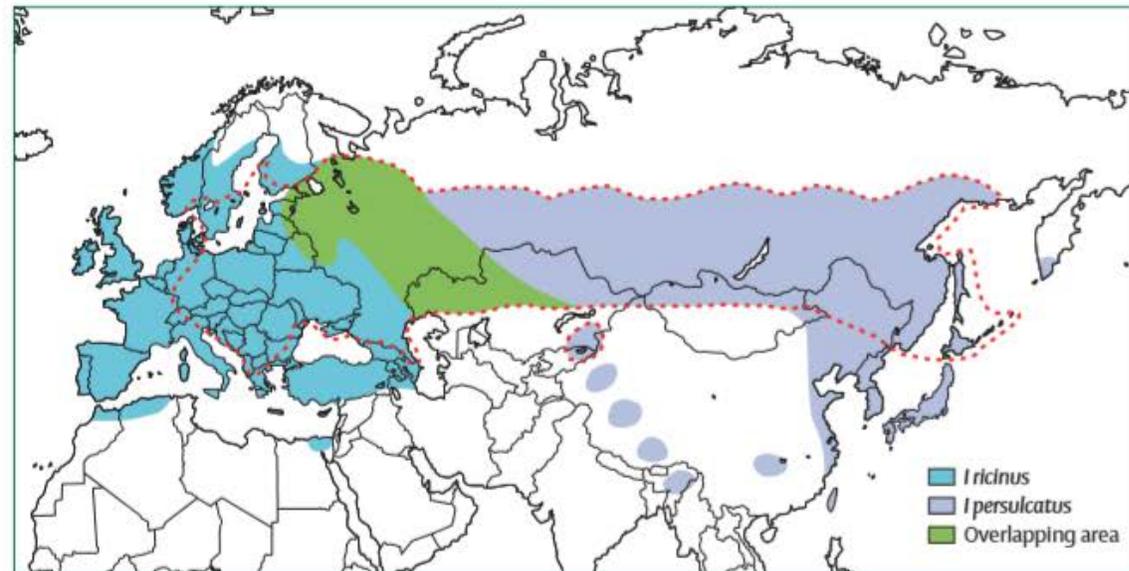
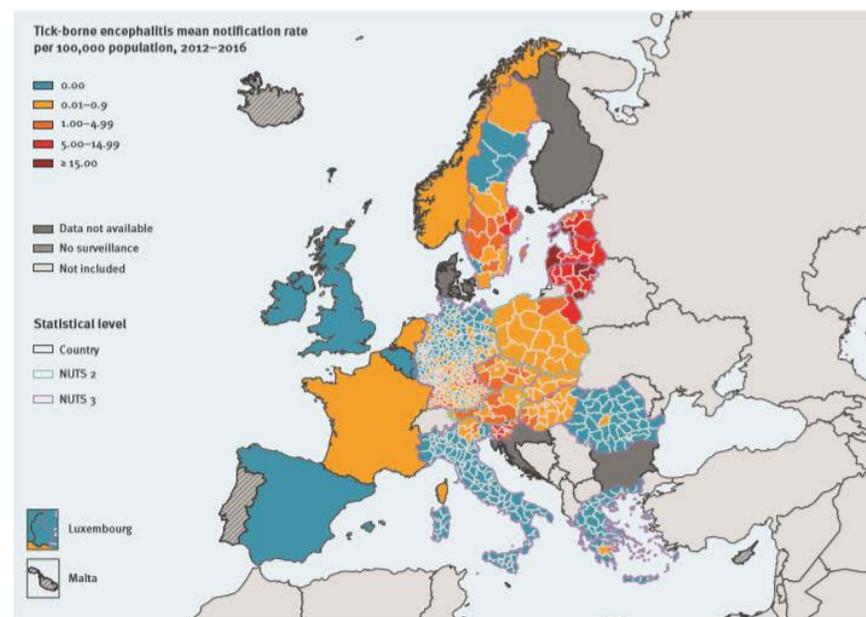


Figure 2: The geographical distribution of *Ixodes* spp, with the western distribution for *I. ricinus* and the eastern distribution for *I. persulcatus*



Rate of locally acquired tick-borne encephalitis per 100,000 population, by place of infection, European Union and European Economic Area countries, 2012–2016



ECDC. Map produced on: 19 July 2018



Tick-borne encephalitis

- **Incubation period:** median of 8 days (range 4–28) after tick bite
- **Clinical presentation:**
 - **2/3: asymptomatic**
 - **First stage:** fever, fatigue, general malaise, headache
 - **Second stage:** mild meningitis to severe encephalitis with or without myelitis and spinal paralysis
- **CSF analysis:** moderate pleocytosis (initially PMN and then mononuclear)
- **MRI** abnormalities: up to 18%; **EEG:** abnormal in 77%
- 1/3 of patients with lasting sequelae
- **Diagnosis:** serology
- No specific **treatment**





Tick-borne encephalitis

Home / Eurosurveillance / Volume 24, Issue 47, 21/Nov/2019 / Article

Rapid communication

Open Access

Detection of new endemic focus of tick-borne encephalitis virus (TBEV), Hampshire/Dorset border, England, September 2019

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Maya Holding^{1,2,3}, Stuart D Dowall^{1,2}, Jolyon M Medlock^{1,3}, Daniel P Carter^{1,4}, Liz McGinley^{1,3}, Mollie Curran-French², Steven T Pullan⁴, John Chamberlain², Kayleigh M Hansford^{1,3}, Matthew Baylis^{1,5}, Richard Vipond^{1,2}, Roger Hewson^{1,2}



Surveillance épidémiologique de l'encéphalite à tiques

TBEV - 2018

Auteurs: T. Lernout, M. Van Esbroeck

Messages clés

- En 2018, trois cas d'encéphalite à tiques ont été rapportés en Belgique.
- Un cas était importé d'Allemagne. Les deux autres personnes ont possiblement/probablement été infectées en Belgique.



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Office fédéral de la santé publique OFSP

Encéphalite à tique: extension des zones à risque où la vaccination est recommandée

Berne, 4.2.2019 - Les cas de méningoencéphalite à tique sont en forte hausse depuis plusieurs années et ont atteint un niveau record en 2018 avec 377 cas déclarés. Face à cette évolution, l'OFSP actualise les zones à risque: désormais, la vaccination contre la méningoencéphalite à tique est recommandée dans toute la Suisse – à l'exception des cantons de Genève et du Tessin – pour les personnes qui s'exposent aux tiques lors d'activités en plein air et tout particulièrement en forêt.

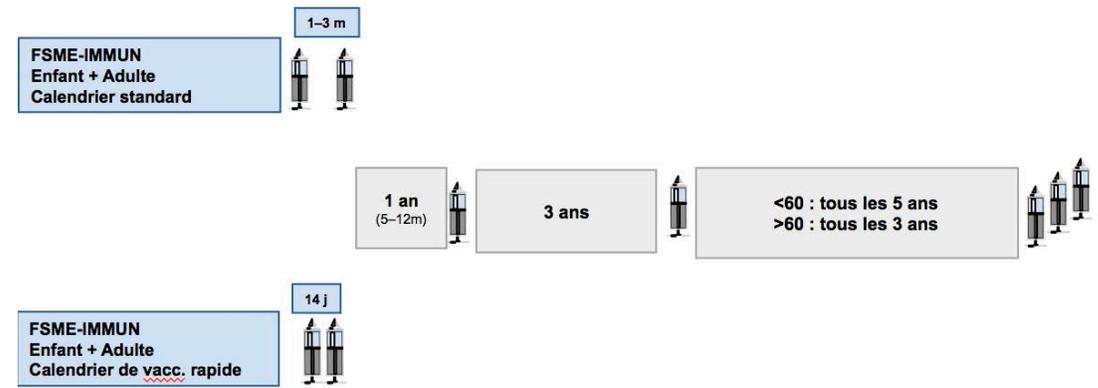


Tick-borne encephalitis



• Prevention

- large-scale youth summer camps are held in TBE prevalent areas (e.g. Southern Germany, Austria).
- Participating children and their parents should be adequately informed on preventive measures such as avoidance of tick bites and vaccination which should be encouraged
- Need for a pre-travel advice (that's not to be restricted to « exotic destinations »)



en cas d'interruption du calendrier de vaccination comptant au moins deux vaccinations préalables, une dose de rattrapage unique est suffisante pour poursuivre le calendrier de vaccination

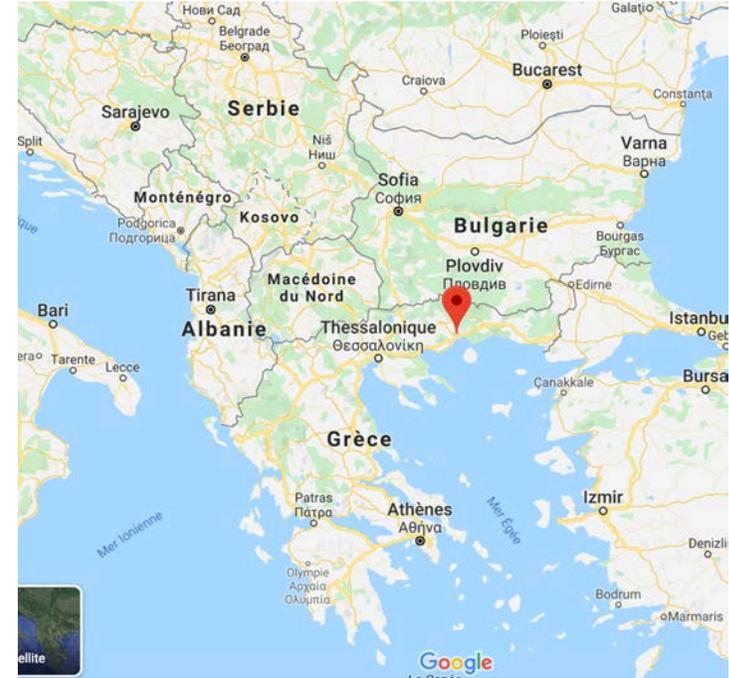
At least 2 injections are needed before departure → this gives a level of protection of 90-95% 2 weeks after the second injection



Case



- A 73-year-old Belgian woman returning from Greece (Kavala city)
- She had a medical history of lymphoma
- Developed 6-day history of fever, headache, malaise, nausea, confusion, decline of consciousness, and neck stiffness
- Cerebrospinal fluid (CSF) testing showed
 - 90 cells/ μ L (79% lymphocytes)
 - glucose of 72 mg/dL
 - protein levels 100.9 mg/dL,



Hypotheses

1. Dengue
2. West Nile Virus Infection
3. Japanese encephalitis
4. Herpes encephalitis
5. Tick-borne encephalitis

Laboratory results confirming WNV infection of 73-year-old woman, Greece, 2012*†

Sample	Date	RT-PCR (C _t value)	WNV ELISA IgM (ratio)	WNV ELISA IgG (ratio)	
Serum	Aug 15	Positive (45.47)	Positive (25)	Negative	Greece
CSF	Sep 3	ND	Positive (5.16)	Positive (2.21)	Belgium
Serum	Sep 6	Positive (42.87)‡	Positive (4.76)	Positive (2.63)	

*WNV, West Nile virus; RT-PCR, reverse transcription PCR; Ct, cycle threshold; Flavi, flavivirus; IFAT, indirect fluorescent antibody technique; ND, not done; CSF, cerebrospinal fluid.

†The ELISA is positive if ratio >1.1 for IgM and >1.5 for IgG. The cutoff value for IFAT is 1/10 for both IgG and IgM.

‡Sequencing revealed a 116-bp sequence perfectly matched to the WNV amplicon and is highly suggestive for WNV lineage 2 on the basis of the presence of 2 specific nucleotides.

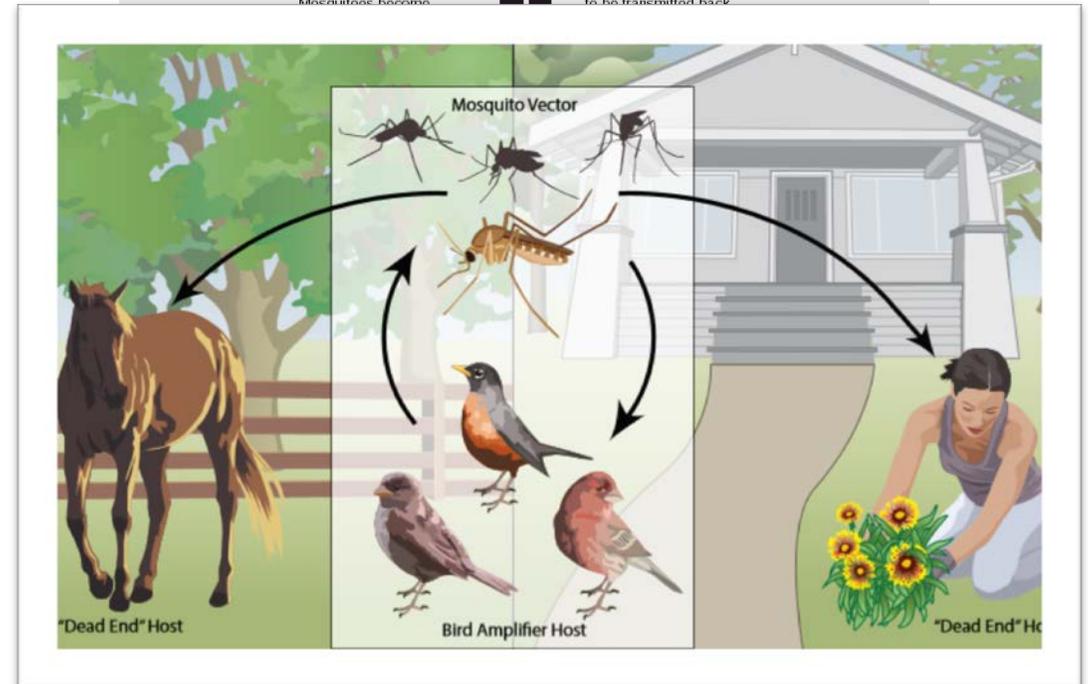
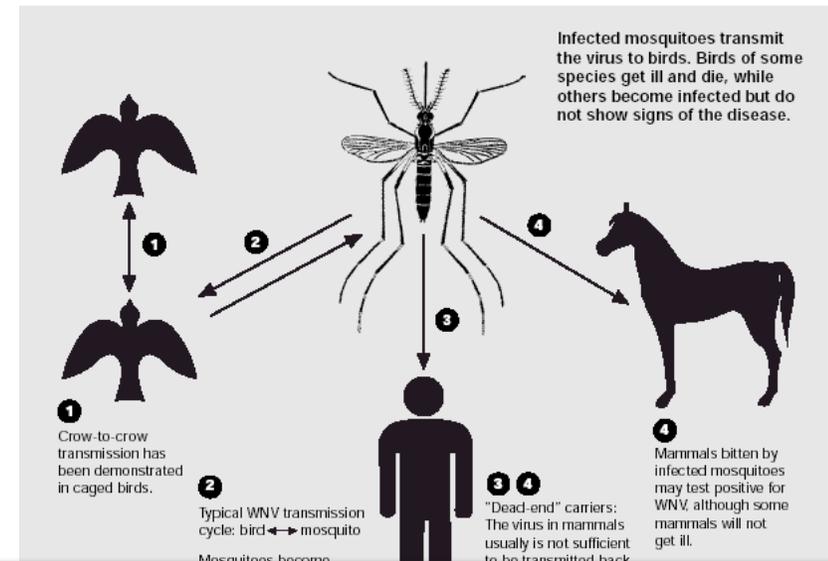
§Strongest signal for WNV, weak signal for other flaviviruses (Japanese encephalitis virus, dengue viruses 1–4, yellow fever virus).

Confirmation of West Nile Virus (lineage 2) infection



West Nile virus

- **Genus:** Flavivirus,
Family: Flaviviridae
- **Transmission:** mosquito-bite: *Culex pipiens.*, (*Aedes* spp.)
- **Human and horses are accidental hosts**
- **Geography:** worldwide
- **Temperature** is an important limiting factor for WNV circulation in northern Europe



Ref: <https://www.cdc.gov/westnile/>; <https://www.ecdc.europa.eu/en/west-nile-virus-infection>;
Siensano, Fiche informative, West Nile Virus, juillet 2016;

Vogels C, Hartemink N, Modelling West Nile virus transmission risk in Europe: effect of temperature and mosquito biotypes on the basic reproduction number; Scientific reports, Nature, 7: 5022, July 2017



West Nile Virus

- ✓ Incubation :
2-6d, sometimes 14d
- ✓ **Most human infections are asymptomatic.**
- ✓ Clinical symptoms occur in
≈20% of case-patients : flu-like
syndrome
 - fever, headache, and myalgia;
 - <1% of WNV infections
develop into severe
neuroinvasive disease

Clinical Criteria

At least one of the following three:

- Any person with fever
- Encephalitis
- Meningitis

Laboratory Criteria

Laboratory test for case confirmation

At least one of the following four:

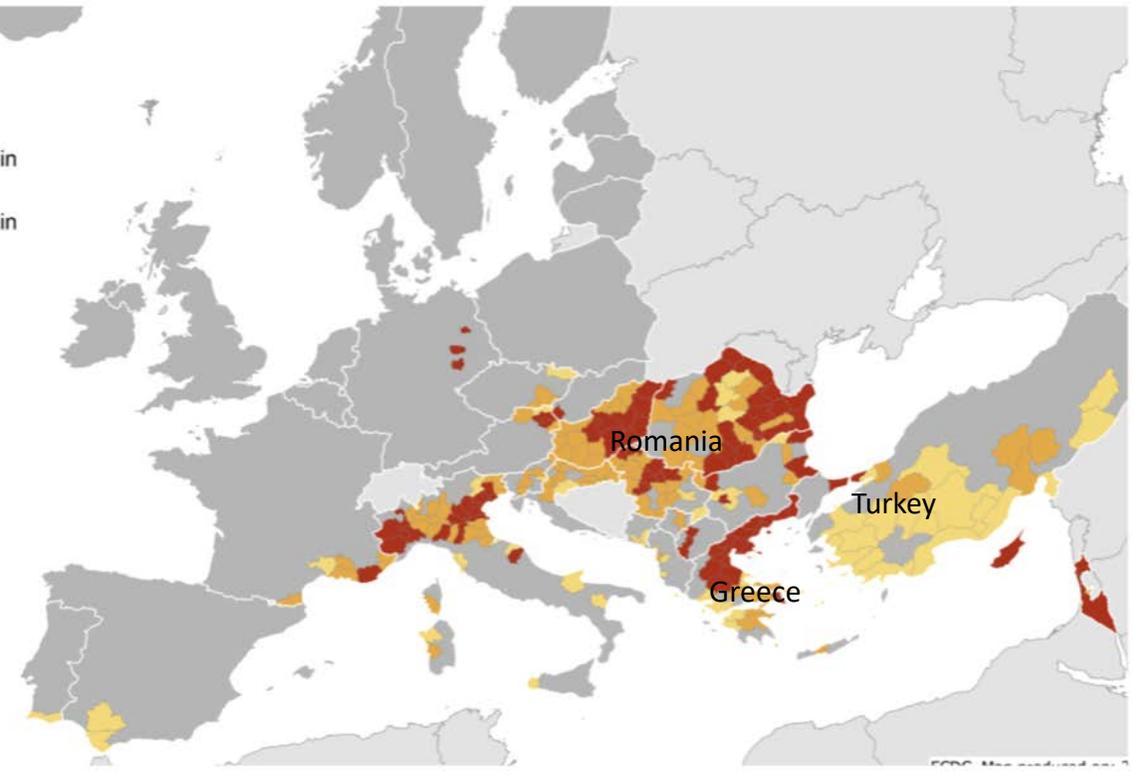
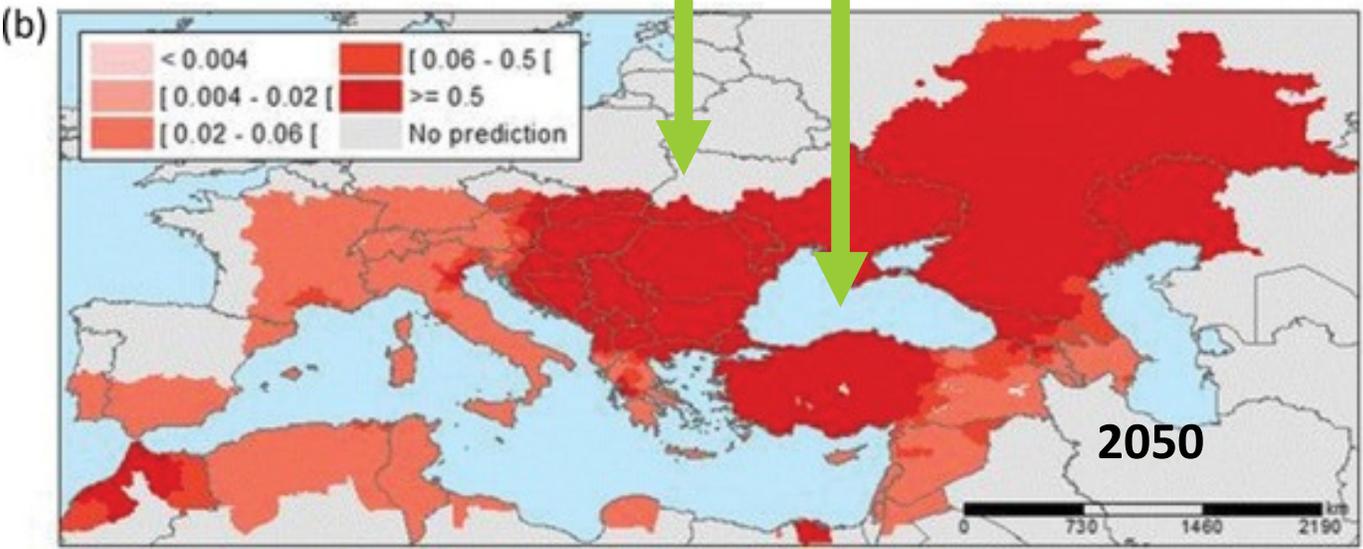
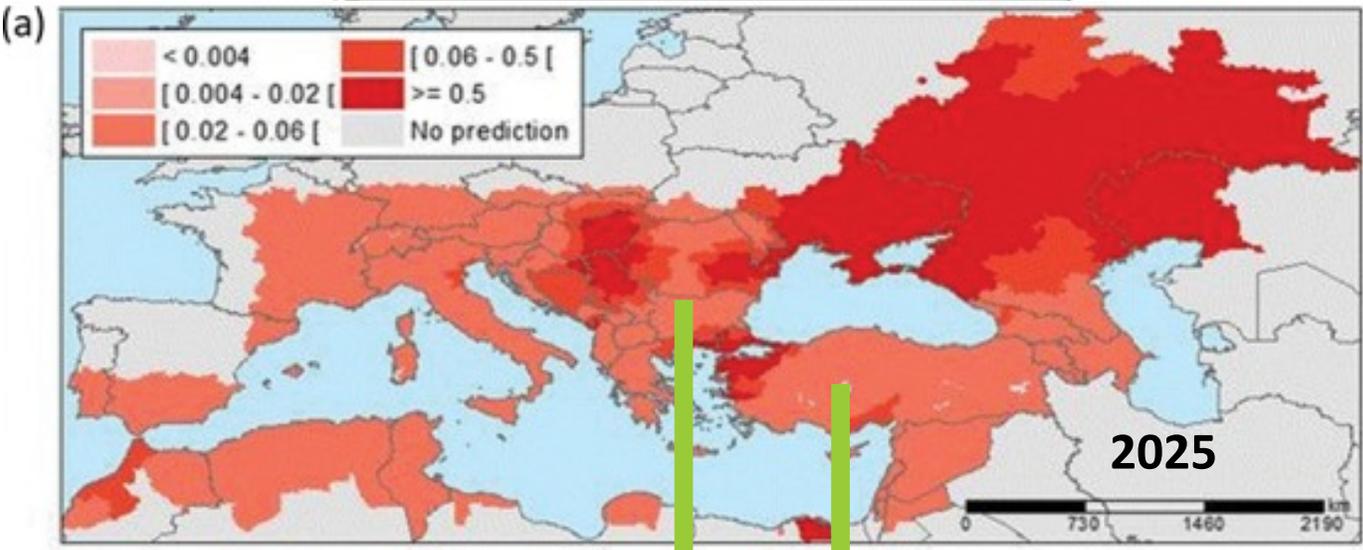
- Isolation of WNV from blood or CSF
- Detection of WNV nucleic acid in blood or CSF
- WNV specific antibody response (IgM) in CSF
- WNV IgM high titre AND detection of WNV IgG, AND confirmation by neutralisation

Laboratory test for a probable case

WNV specific antibody response in serum

Laboratory results need to be interpreted according to flavivirus vaccination status

during the acute phase of the
disease



EU Member States have reported 410 human West Nile virus infections since the beginning of the 2019 transmission season. To date, 50 deaths due to West Nile virus infection have been reported (>> Greece)

Predicted probability of districts with West Nile virus (WNV) infections for (a) 2025 and (b) 2050 based on July temperatures.

Ref: <https://www.cdc.gov/westnile/>; <https://www.ecdc.europa.eu/en/west-nile-virus-infection>; Siensano, Fiche informative, West Nile Virus, juillet 2016; Vogels C, et al. ; Scientific reports, Nature, 7: 5022, july 2017 Environ Health 2016;15(Suppl 1):S28.



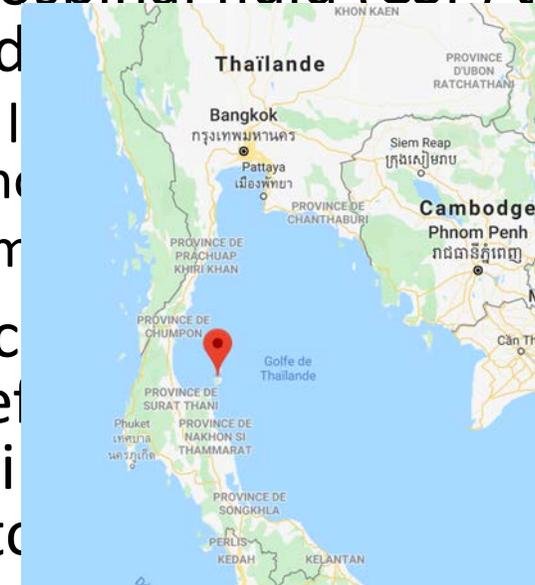
Case



- A 20 year-old Spanish man returning from Thailand (he visited Bangkok and some rural areas)
- He was bitten by mosquitoes
- He was first admitted to a local hospital in Koh Samui with a 48 hours history of fever ($\geq 38^{\circ}\text{C}$), myalgia, malaise and headache.
- Progressively, he developed photophobia and decreased level of consciousness.

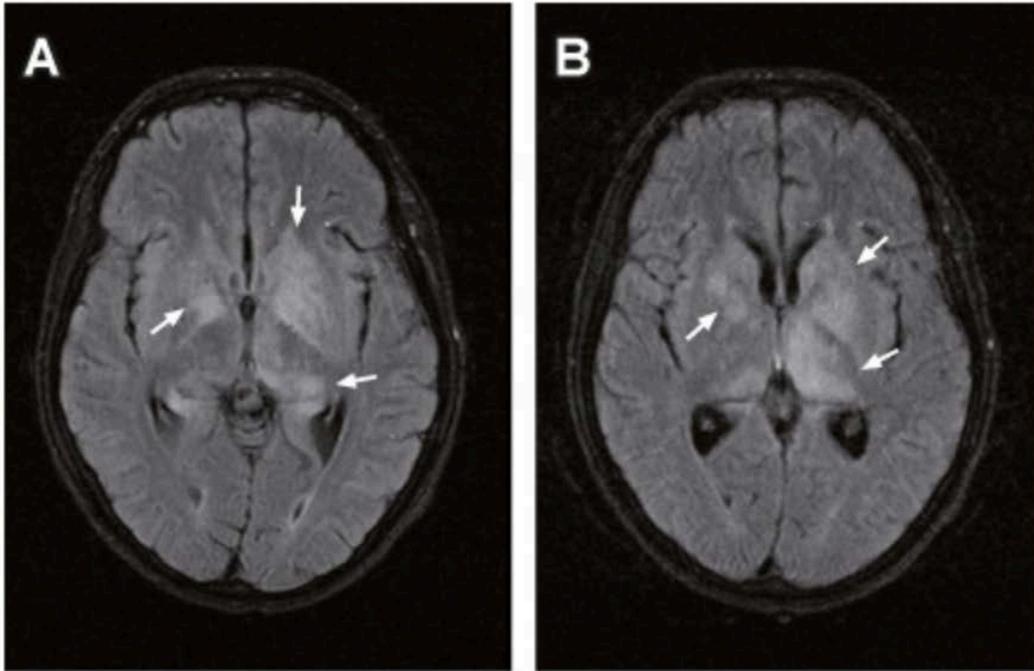


- Cerebrospinal fluid (CSF) testing showed
 - 960 l/mm³ mononuclear cells
 - normal protein
- Empiric treatment with ceftriaxone, aciclovir, and phenytoin initiated
- After five days the patient was tetraparetic and did not respond to simple commands.



FIGURE

Brain magnetic resonance images of a Spanish traveller returning from Thailand with Japanese encephalitis 35 days post-onset of symptoms, Spain, 26 March 2013



Images in fluid attenuated inversion recovery (FLAIR) sequence. Extensive patchy lesions in left basal nuclei and both hippocampi are visible (white arrows).

- A cerebral magnetic resonance image (MRI) showed extensive **patchy lesions** in left basal nuclei, midbrain, both hippocampi, left caudate nucleus, both internal capsule and left thalamus

Hypotheses

1. Dengue
2. West Nile Virus Infection
3. Japanese encephalitis
4. Herpes encephalitis
5. Tick-borne encephalitis

- RT-PCR for Japanese encephalitis virus (JEV) in CSF was negative.
- IgM against JEV by ELISA in serum was positive (IgM in CSF not performed).
- Two months later → IgG titre against JEV was also positive (1:1280)

Diagnosis of Japanese Encephalitis



Japanese encephalitis

Genus: flavivirus,
Family Flaviviridae

Transmission: *Culex* mosquitoes bite from early dusk until dawn (during the night-time)

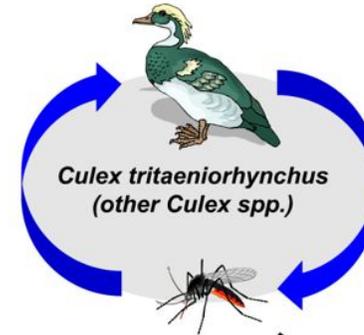
Geography: rural areas of South Asia (from India to Japan)

Season: mainly from April-May to December.

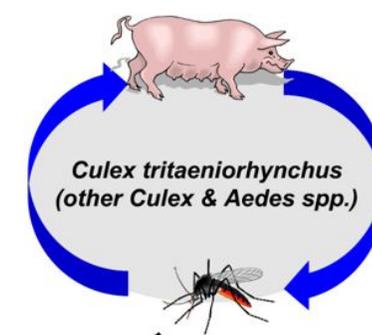
- 35,000 to 50,000 cases occur annually throughout Asia and parts of the western Pacific

- **The risk for travellers to the Far East is extremely low (<1 in 1,000,000 tourists who have been travelling for 1 month).**

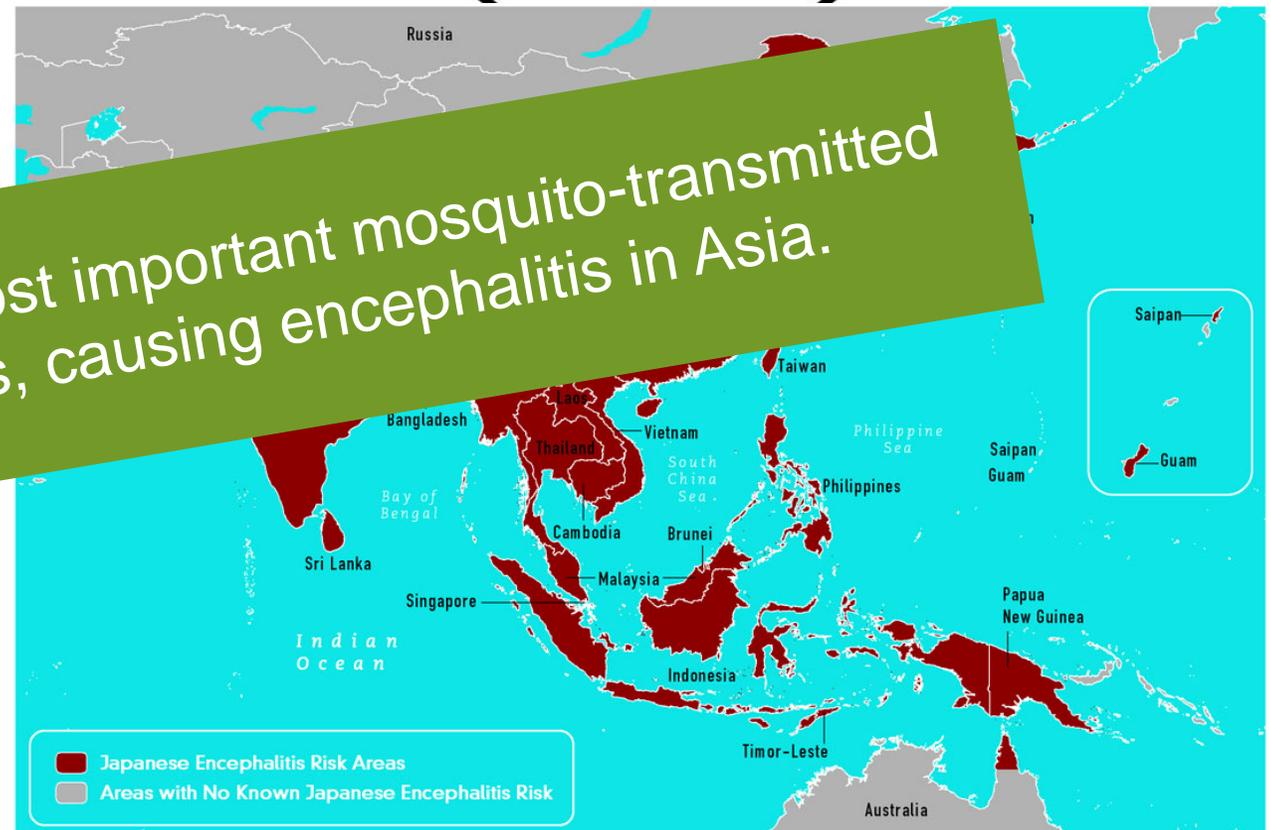
Endemic / natural cycle



Amplification cycle



JEV is the most important mosquito-transmitted arbovirus, causing encephalitis in Asia.



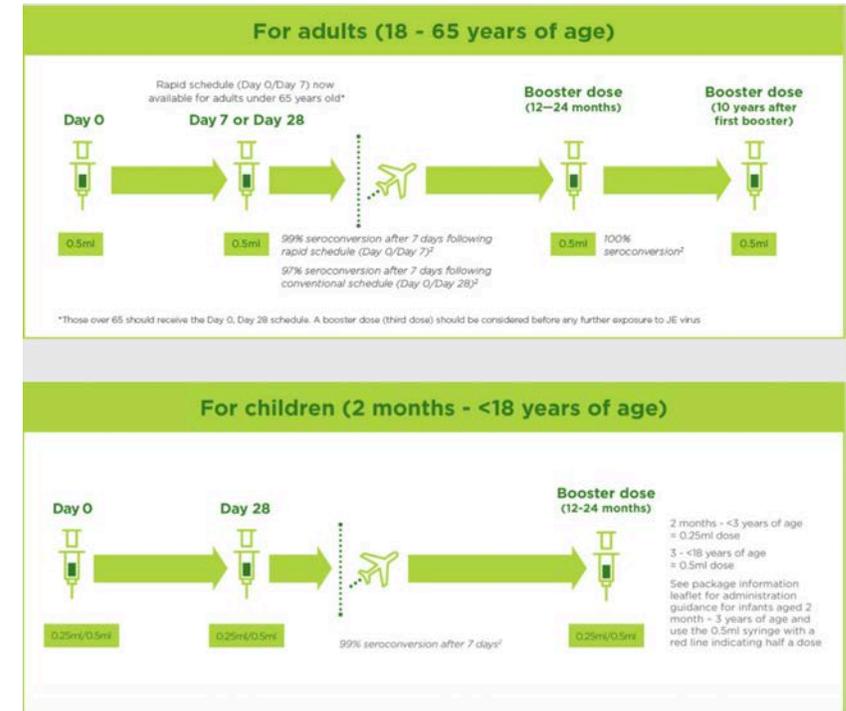


Japanese encephalitis



IXIARO® (0,5 ml for adults and 0,25 ml for children between 2 months and 2years)

- **Incubation period:** 5-15 days
- **Clinical presentation:**
 - Mostly asymptomatic
 - **< 1% get ill** : encephalitis with symptoms including sudden onset of headache, high fever, disorientation, coma and Parkinsonian syndrome (tremors, masklike facies) and convulsions.
- **The mortality rate** among the symptomatic cases is approximately 25%.
- **Morbidity:** 30% chance of neurological and/or psychiatric residual damage if a symptomatic patient survives the illness.
- **Diagnosis:** Antibodies in Serum and CSF (PCR is less sensitive)
- **CSF:** mild to moderate pleocytosis with a lymphocytic predominance, slightly elevated protein
- **MRI** better than CT scan for detecting abnormalities as thalamic lesions (most commonly lesions)
- No specific **treatments**, only supportive treatments
- **Prevention:** Vaccination



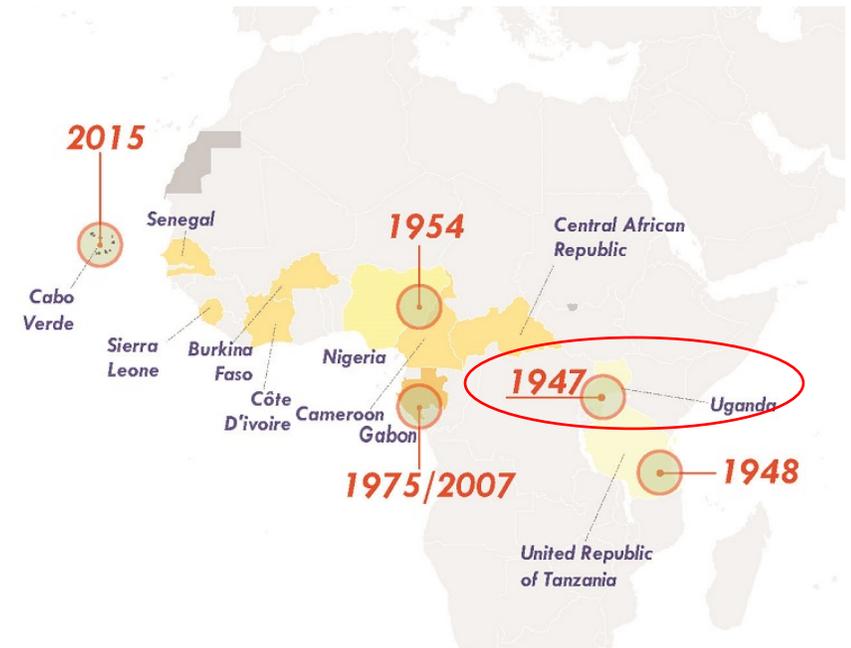
Vaccination is recommended for persons travelling for at least **3-4 weeks** through **rural areas** during the transmission season



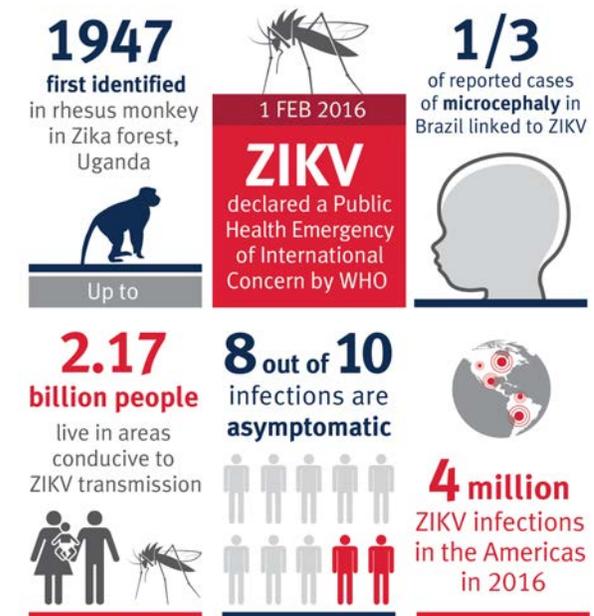
Zika Virus



- Zika virus derives its name from the Zika forest in Uganda where it was identified in 1947 in samples taken from a captive, sentinel rhesus monkey.
- 1952: The first human cases are detected in Uganda and in Tanzania.
- The first outbreak was reported in Micronesia in 2007, 60 years after its discovery.
- The link between ZIKV and neurological complications was first recognised when an epidemic in French Polynesia in 2013 was followed by a 20-fold increase in incidence of GBS cases



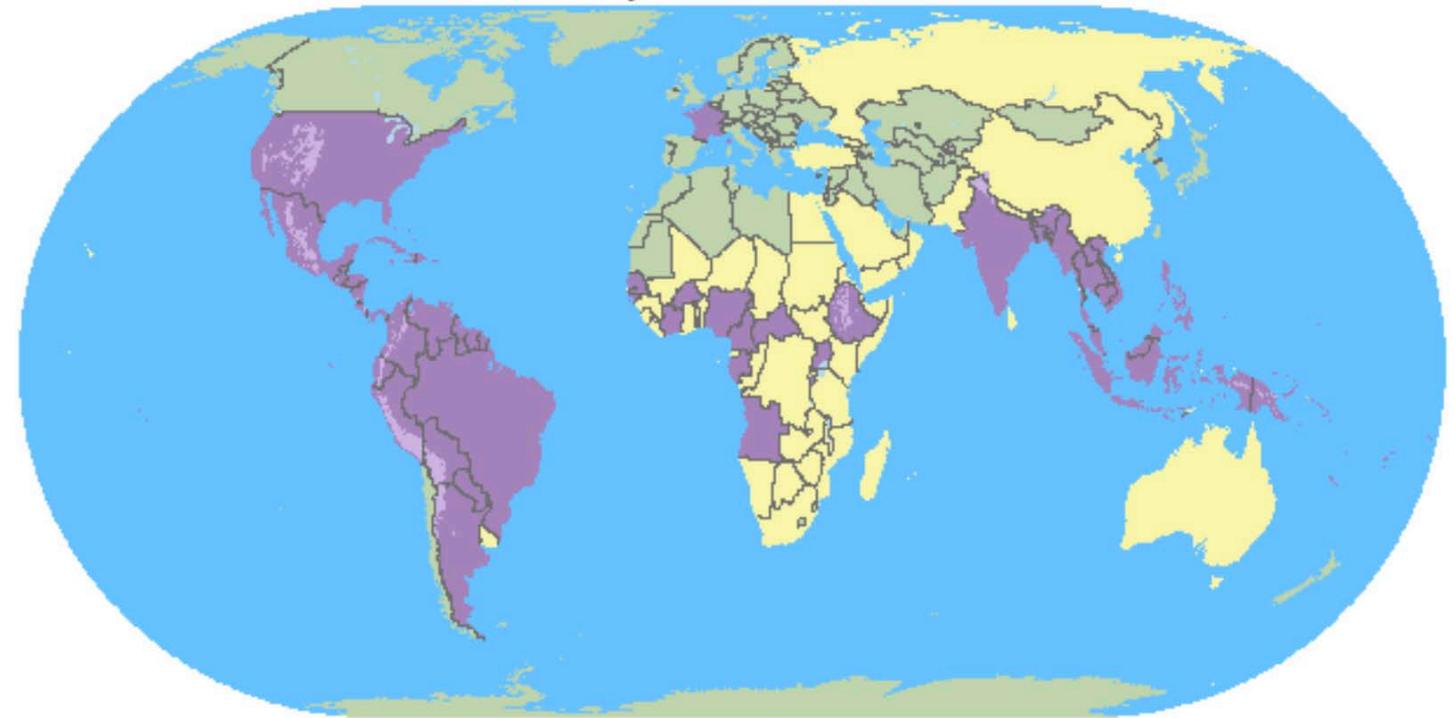
- 2015 :pandemic spread of the virus to the Americas, the Caribbean, and Africa
 - In 2016: In Brazil, dramatic increase in microcephaly cases was detected among newborns with a causal link between ZIKV and birth defects
- World Health Organization (WHO) declared ZIKV as a public health emergency of international concern
- Later: ZIKV is recognized as a cause of a range of neurologic disorders, including the Guillain–Barré syndrome (GBS) in adults.



Zika Virus

- **Family:** Flaviviridae
- **Genus:** Flavivirus,
- **Transmission:**
 - mosquito-bite: *Aedes aegypti* r
 - Direct transmission between hu
 - Vertical transmission from
 - via blood transfusion,
 - and by sexual contact (1%

- **Geography** The virus has spread to a further 84 countries in the Americas, Africa and Asia.
- 2130 travel-imported cases in Europe and around 5500 travel-imported cases in the USA since the start of the Brazilian epidemic



Map Legend

- | | | | |
|--|---|---|---|
|  | Country or territory with current Zika outbreak ¹ |  | Country or territory with mosquito ² but no reported Zika cases ² |
|  | Country or territory that has ever reported Zika cases ² (past or current) |  | Country or territory with no mosquitoes that spread Zika |
|  | Areas with low likelihood of Zika infection because of high elevation (above 6,500 feet/2,000 meters) | | |

¹ No areas are currently reporting Zika outbreaks

² Locally acquired, mosquito-borne Zika cases

Zika Virus

- **Incubation period:** 3–10 days
- **Clinical presentation:**
 - 80% asymptomatic
 - 20%: fever, rash, non-purulent conjunctivitis and arthralgia lasting up to a week
- **Diagnosis:** Recent ZIKV infection is confirmed through RT-PCR of serum, urine and CSF specimens and ZIKV IgM of serum and CSF.
- **Treatment** no specific antiviral treatment
- **Prevention:** several vaccines in development



Similar to other neurotropic viruses, the Zika virus targets the central nervous system and has been shown to infect peripheral neurons directly and induce cell death.

Box 2 Neurological conditions associated with Zika

- ▶ Congenital Zika syndrome.
- ▶ Peripheral nervous system*:
 - Guillain-Barré syndrome.
 - Chronic inflammatory demyelinating polyneuropathy.
 - Acute transient polyneuritis.
- ▶ Central nervous system*:
 - (Meningo)encephalitis.
 - Myelitis.
 - Acute disseminated encephalomyelitis (ADEM).
 - Encephalopathy.

*There have also been some cases of combined central and peripheral disease.¹⁷



Three people caught ZIKA in southern France, in August, this year, the European Centre for Disease Prevention and Control has confirmed.

First native Zika cases in Europe confirmed as experts warn climate change could bring more

By Rob Picheta, CNN
Updated 14:25 GMT (22:25 HKT) November 7, 2019



and kill more people each year

Source: CNN



Communiqué de presse

Un deuxième cas de Zika diagnostiqué dans le Var.

21 octobre 2019

Communiqué de presse

Une personne atteinte de l'infection à virus Zika vient d'être diagnostiquée dans le Var. Ce qui porte à 2 le nombre de cas autochtones de Zika dans le département. Ces personnes sont aujourd'hui guéries.



Sandfly fever

- Sandflies: vector of a lot of different diseases (*Leishmaniases, Bartonella, phlebovirus*)
- *Phlebovirus* contains Toscana sandfly virus (TOSV), sandfly fever Naples (SFNV) and other viruses endemic in Mediterranean region
- Sandfly fever Naples virus: 3-day fever or “papatacci fever”
- Toscana virus:
 - Incubation 3-7d max 2 wk)
 - Peak of incidence in August
 - Most infections are asymptomatic
 - Flu-like syndrome, acute meningitis or meningo-encephalitis.
- Diagnostic: Serology
- **No specific treatment or prevention**

Ref: Depaquit J, Grandadam M, Fauque F, Andry PE, Peyrefitte C. Arthropod-borne viruses transmitted by Phlebotomine sandflies in Europe : A review. *Euro Surveill* 2010;15:19507
Ayhan N, Charrel RN. Of phlebotomines (sandflies) and viruses: a comprehensive perspective on a complex situation. *Curr Opin Insect Sci* 2017;22:117-24.

Distribution of Toscana virus in the European Union and neighbouring countries around the Mediterranean Sea up to 2009



Tschumi et al. *BMC Infectious Diseases* (2019) 19:591
<https://doi.org/10.1186/s12879-019-4231-9>

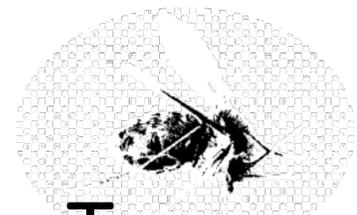
BMC Infectious Diseases

CASE REPORT Open Access

Meningitis and epididymitis caused by Toscana virus infection imported to Switzerland diagnosed by metagenomic sequencing: a case report

Fabian Tschumi¹, Stefan Schmutz², Verena Kufner², Maïke Heider³, Fiona Pigny⁴, Bettina Schreiner³, Riccarda Capaul², Yvonne Achermann^{1†} and Michael Huber^{2†}

Abstract
Background: We report a rare case of Toscana virus infection imported into Switzerland in a 23-year old man who travelled to Imperia (Italy) 10 days before onset of symptoms. Symptoms included both meningitis and as well as epididymitis. This is only the fourth case of Toscana virus reported in Switzerland.
Presentation: The patient presented with lymphocytic meningitis and scrotal pain due to epididymitis. He was initially treated with ceftriaxone. Herpes simplex, tick-borne encephalitis, enterovirus, and *Treponema pallidum* were excluded with specific polymerase chain reaction (PCR) and serological assays. Subsequent metagenomic sequencing of the patient's cerebrospinal fluid (CSF) revealed the presence of Toscana virus RNA.



Toscana virus in 2019

ARTICLE IN PRESS

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Serologic evidence of widespread Toscana virus infection in Bulgaria

Iva Christova^a, Elitsa Panayotova, Iva Trifonova, Evgenia Taseva, Teodora Gladnishka, Vladislava Ivanova

^a National Center of Infectious and Parasitic Diseases, Sofia, Bulgaria

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ABSTRACT
Background: Toscana virus (TOSV) is an emerging sandfly-borne virus that is endemic in Mediterranean countries.
Methods: In order to detect TOSV circulation among the human population of Bulgaria, serum samples from 459 apparently healthy adult individuals, residing in 19 out of 28 districts in the country, were tested for the presence of IgG antibodies to TOSV.
Results: An overall seroprevalence rate of 24.4% was observed, ranging from 4.4% to 53.5% in the districts. Rates were highest in persons over 60 years of age and residing in the southern districts.
Conclusion: The results of the first TOSV seroprevalence study in Bulgaria revealed that it is widespread in the country.

viruses

Article

Circulation of Toscana Virus in a Sample Population of Corsica, France

Shirley Masse^{1,*}, Nazli Ayhan^{2,†}, Lisandru Capai¹, Frédéric Bosseur³, Xavier de Lamballerie², Rémi Charrel² and Alessandra Falchi¹

¹ Université de Corse Pascal Paoli, EA7310 BIOSCOPE, 20250 Corte, France
² Unité des Virus Emergents (UVE, Aix Marseille Univ, IRD 190, INSERM 1207, IHU Méditerranée Infection), 13385 Marseille, France
³ Sciences Pour l'Environnement—UMR CNRS 6134, Université de Corse, 20250 Corte, France
 * Correspondence: masse_s@univ-corse.fr; Tel.: +33-420-202-219; Fax: +33-420-202-392
 † These authors contributed equally to this work.

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Abstract: Sandfly-borne phleboviruses pathogenic to humans, such as Toscana virus (TOSV) and Sandfly Fever Sicilian virus (SFSV), are endemic in the Mediterranean region. In France, numerous cases of TOSV infection have been described, causing either meningitis or encephalitis. The present study was to investigate the seroprevalence of TOSV among the population of Corsica. In this cross-sectional study, participants were recruited from (i) the University of Corsica and (ii) from general practitioners.



Arboviral encephalitis in the US

La Crosse encephalitis,
Eastern Equine encephalitis,
Saint Louis encephalitis

- Vector: mosquito
- Host: Mammals, birds
- Human: « dead-end » host
- No treatment or specific prevention

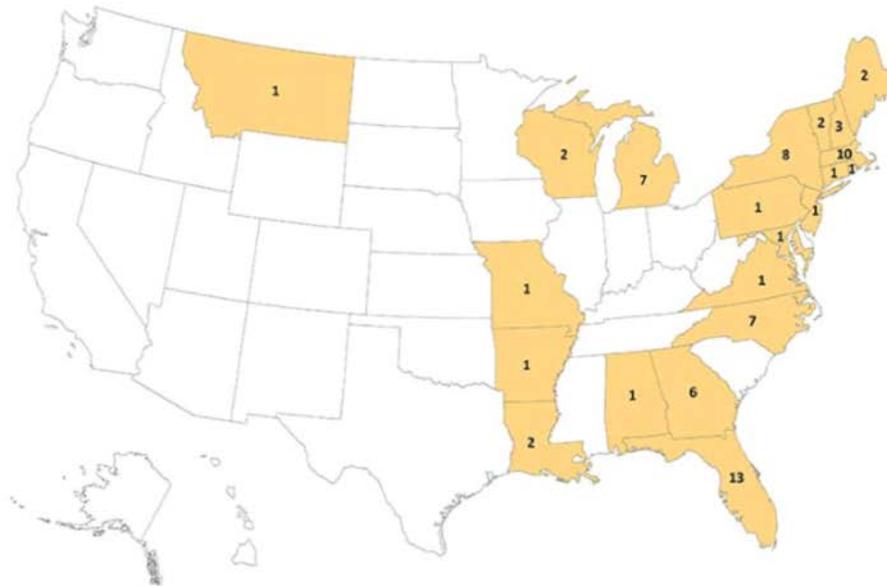
La Crosse virus neuroinvasive disease cases reported by state of residence, 2009–2018



St. Louis encephalitis virus neuroinvasive disease cases reported by state of residence, 2009–2018



Eastern equine encephalitis virus neuroinvasive disease cases reported by state of residence, 2009–2018



Source: ArboNET, Arboviral Diseases Branch, Centers for Disease Control and Prevention

	Tick borne encephalitis	West Nile Virus	Japanese encephalitis	Zika Virus
Virus	Flavivirus	Flavivirus	Flavivirus	Flavivirus
Arthropod	Ixodes	Mosquito (Culex)	Mosquito (culex)	Mosquito (Aedes aegypti) + Mother-to-child transmission and sexual
Asymptomatic	60%	80%	99%	80%
Incubation	8 days	2-6 days	5-15 days	3-10 days
Neurological syndromes	mild meningitis to severe encephalitis with or without myelitis and spinal paralysis	<1%: neuroinvasive disease: Meningitis, Encephalitis, Acute flaccid paralysis	<1%: encephalitis, Parkinson Syndrome (25% mortality and 30% morbidity)	Microcephaly, GBS, meningoencephalitis
Geographic distribution	from western Europe to the eastern coast of Japan	Worldwide	rural areas of Southern and South-east Asia	Americas, Africa and Asia.
Season	spring to autumn		from April-May to October-December.	
	> 10.000 cases every year worldwide	410 WNV infections since the beginning of the 2019 in Europe	35,000 to 50,000 cases occur annually throughout Asia and parts of the western Pacific	2130 travel-imported cases in Europe since the start of the Brazilian epidemic
Prevention	Vaccine	/	Vaccine	/

Polio

HISTORY OF POLIO IN BELGIUM



Roosevelt, Franklin D.
Franklin D. Roosevelt (left) with John W. Davis, 1928.
Encyclopædia Britannica, Inc.

1956: 1038 cases in a single year – vaccine introduced

1958: Large vaccination campaigns

1960: 300 cases of polio

1967: Vaccination becomes mandatory

1979: last autochthonous case

1989: last imported case

→ **2002: EUROPE DECLARED POLIO-FREE**





- Polio is an infection caused by a human enterovirus
- Human enteroviruses are divided into 4 species:
 - A, B or D
 - C → Poliovirus serotype 1, 2 and 3
- Poliovirus is transmitted by fecal-hand-oral contamination
- Clinical presentation:
 - 90 to 95 % of poliovirus infections are asymptomatic
 - In 4 to 8 % of individuals: "minor illness" (abortive polio)= viral infection, including headache, sore throat, fever, nausea, vomiting.
 - In a fraction of those patients, involvement of the CNS occurs (usually after few days free of symptoms days) with symptoms of meningitis, including neck stiffness, headache, fever, and vomiting.
 - In some of these patients → destruction of motor neurons → **This paralytic poliomyelitis (Acute Flaccid Paralysis) occurs in only approximately 0.1 % of all poliovirus infections**
- Incubation: 7 to 14 days
- Diagnosis : PCR amplification of poliovirus RNA from the CSF

- No specific treatment for polio infections → only supportive treatment
 - Respiratory failure → mechanical ventilation.
- From a practical clinical perspective, differential diagnoses are
 - other enterovirus infections (no specific treatment)
 - West Nile virus (no specific treatment)
 - Guillain Barré Syndrome (which responds to intravenous immune globulin or and plasma exchange).

So why is surveillance required in Belgium?

- The risk of an epidemic in Belgium remains negligible thanks to high vaccination coverage >90% in all 3 regions (obligatory vaccine).
- Nevertheless, as long as the virus circulates worldwide, a case of poliomyelitis could be imported into Belgium and the virus transmitted to people not or incompletely vaccinated.

With Afghanistan, Syria and RD Congo being among the most frequent countries of origin of asylum seekers in Belgium

2018	2019
States infected with WPV1, cVDPV1 or cVDPV3 with potential risk of international spread	
Afghanistan Pakistan Nigeria	Afghanistan Pakistan Nigeria Papua New Guinea Indonesia Somalia Myanmar
States infected with cVDPV2s, with potential risk of international spread	
DR Congo Nigeria Syria	DR Congo Mozambique Niger Nigeria Somalia Central African Rep.
	Cameroon Benin Ghana Ethiopia Philippines Angola
States no longer infected by WPV1 or cVDPV, that remain vulnerable to re-infection	
Cameroon Central African Republic Chad Niger	Chad Syria Kenya

Enterovirus D68 – The New Polio?

[Hayley Cassidy](#), [Randy Poelman](#), [Marjolein Knoester](#), [Coretta C. Van Leer-Buter](#), and [Hubert G. M. Niesters*](#)

- **Why a surveillance?** because of the increasing number of countries whereas polio virus is circulating and because of the emergence of polio-like virus (EV-D68)
 - Rare cases of CNS disease similar to **acute flaccid paralysis caused by poliomyelitis and attributed to enterovirus D68** have occurred in California between 2012 and 2013, and more widely throughout the United States and other countries between 2014 and 2018
 - EV-D68 storyline shows many similarities with poliovirus a century ago
- **Acute Flaccid Paralysis** (all causes ex. Guillain Barré Syndrome) in <15 year olds must be declared

Notifiable Disease

Polio is a notifiable disease in all 3 regions (there is a notifiable transmissible disease surveillance system: in [Brussels](#), in [Wallonia](#) and in [Flanders](#)).

All cases of, or all suspected cases of polio, including all cases of Acute Flaccid Paralysis (AFP), must be reported to the hygiene inspectors.

▼ PediSurv

Cases of Acute Flaccid Paralysis (AFP) that arise in children under 15 years of age, are monitored by the [PediSurv](#) network.

PediSurv is a surveillance network created to fulfil the objectives set by the [World Health Organization](#), namely the eradication and the elimination of certain paediatric infectious diseases including polio.

This surveillance represents approximately 40% of Belgian paediatricians.



PediSurv

Surveillance pédiatrique des maladies infectieuses

Inscription
Vos données
Liens
Données nationales

Bienvenue

Dans le cadre de l'éradication de la poliomyélite dans la Région européenne de l'Organisation Mondiale de la Santé (OMS) en juin 2002 et de l'élimination de la rougeole pour l'année 2010, un système de surveillance des maladies infectieuses chez l'enfant (Pedisurv) a été mis en place en octobre 2002, en collaboration avec les pédiatres belges et les médecins généralistes de la Région de Bruxelles-Capitale (dans une première phase). La surveillance constitue un des piliers de tout programme d'élimination ou d'éradication d'une maladie.

Les maladies sous surveillance actuellement sont la Paralysie Flaque Aiguë (PFA), la rougeole, les oreillons et les infections invasives à pneumocoques (IPD).

Plus d'informations sur le système de surveillance sont disponibles dans **le rapport d'activité annuel**.

https://www.wiv-isp.be/pedisurv/f_index.htm



- Flaviviruses including Zika virus, West Nile virus and Japanese encephalitis virus, dengue, yellow fever, are spreading worldwide, many of which are associated with neurological diseases.
- Other arboviruses such as Tick borne encephalitis virus or some re-emerging diseases (measles) are increasing in Europe.
- → Don't be afraid to travel... but think about these diseases if you are facing some patients suffering from meningitis, encephalitis or neurological symptoms with no « classical » etiology found.

Thank you for your attention

