44° CONVEGNO NAZIONALE
di Studi di Medicina Trasfusionale
Rimini | Palacongressi, 3-5 maggio 2022
SIMTI

“Piano di sorveglianza delle febbri estive: un modello da continuare a perseguire?”

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Negrar di Valpolicella - Verona

SACRO CUORE DON CALABRIA
IRCCS

Il sottoscritto dr Andrea Angheben,
in qualità di Relatore
dichiara che

nell'esercizio della Sua funzione e per l'evento in oggetto, ***NON*** *È in alcun modo portatore di interessi commerciali propri o di terzi; e che gli eventuali rapporti avuti negli ultimi due anni con soggetti portatori di interessi commerciali non sono tali da permettere a tali soggetti di influenzare le sue funzioni al fine di trarne vantaggio.*

Five arboviral diseases in the world, up to 2020

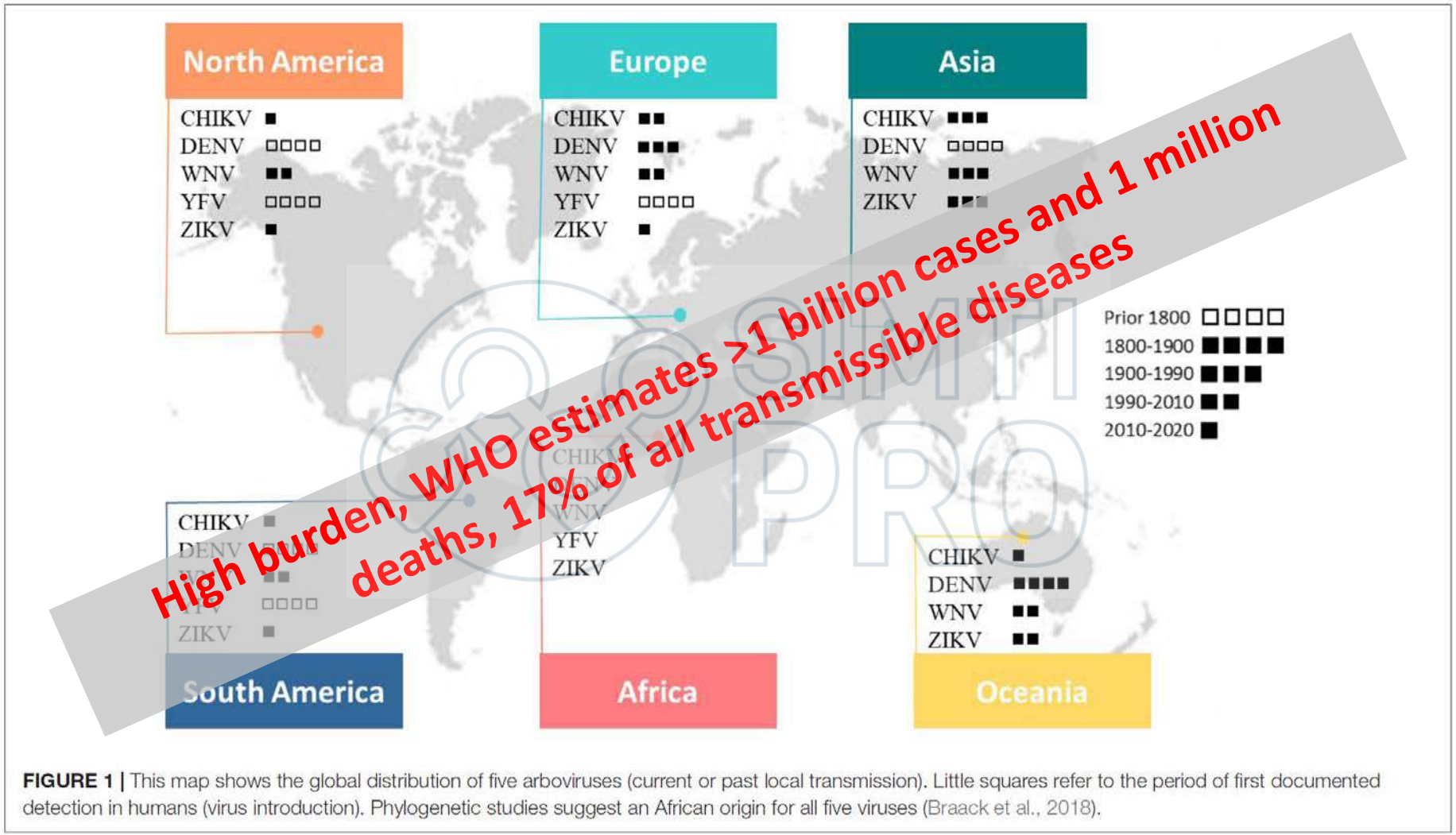
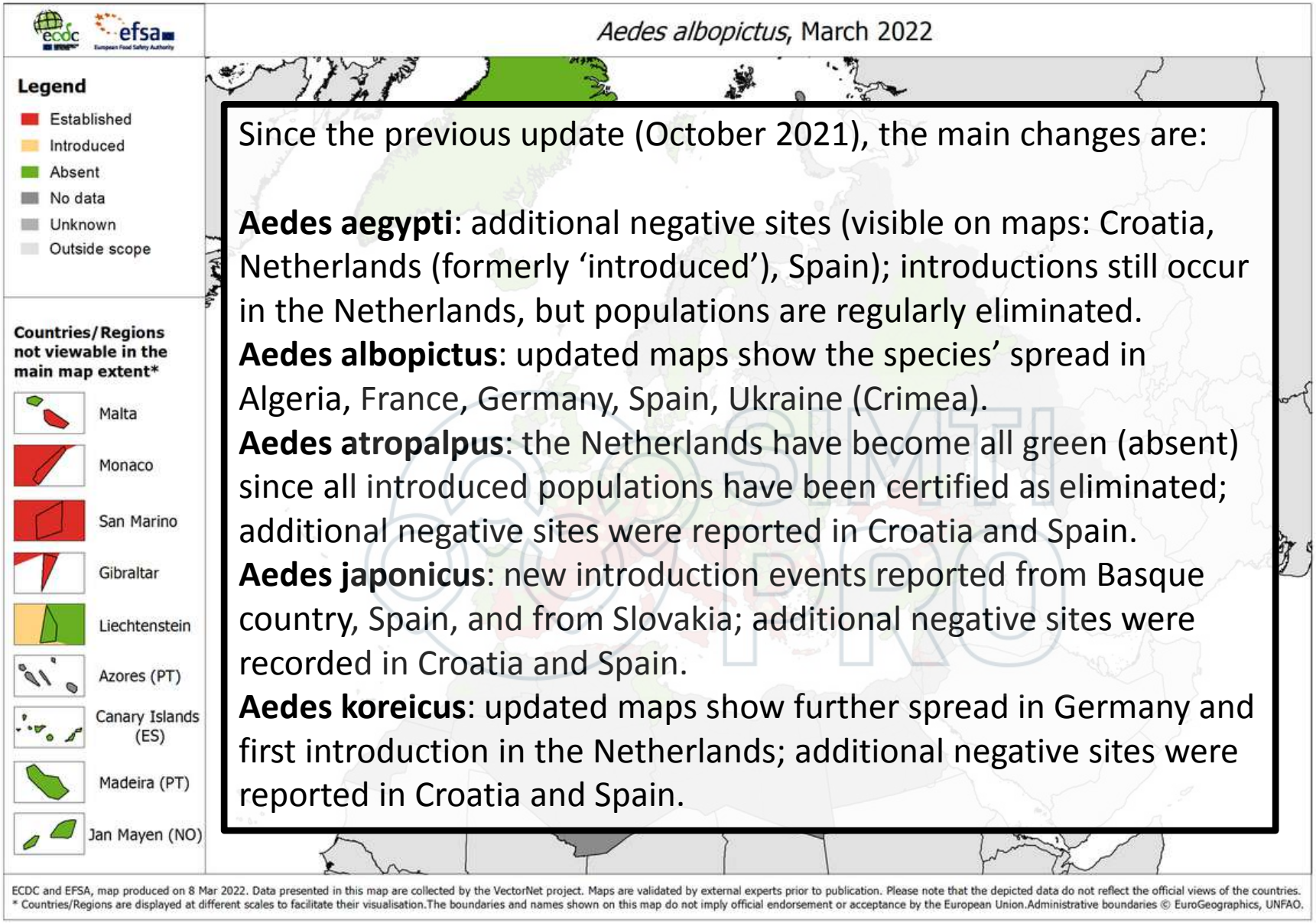


FIGURE 1 | This map shows the global distribution of five arboviruses (current or past local transmission). Little squares refer to the period of first documented detection in humans (virus introduction). Phylogenetic studies suggest an African origin for all five viruses (Braack et al., 2018).

Rachel Bellone, Anna-Bella Failloux. The Role of Temperature in Shaping Mosquito-Borne Viruses Transmission. Frontiers in Microbiology, 2020, 11, 10.3389/fmicb.2020.584846 . hal-02988100



Tiger mosquito, in Italy since 1990, *Culex pipiens molestus* authochtonous

Trop. Med. Infect. Dis. 2020, 5, 150; doi:10.3390/tropicalmed5040150

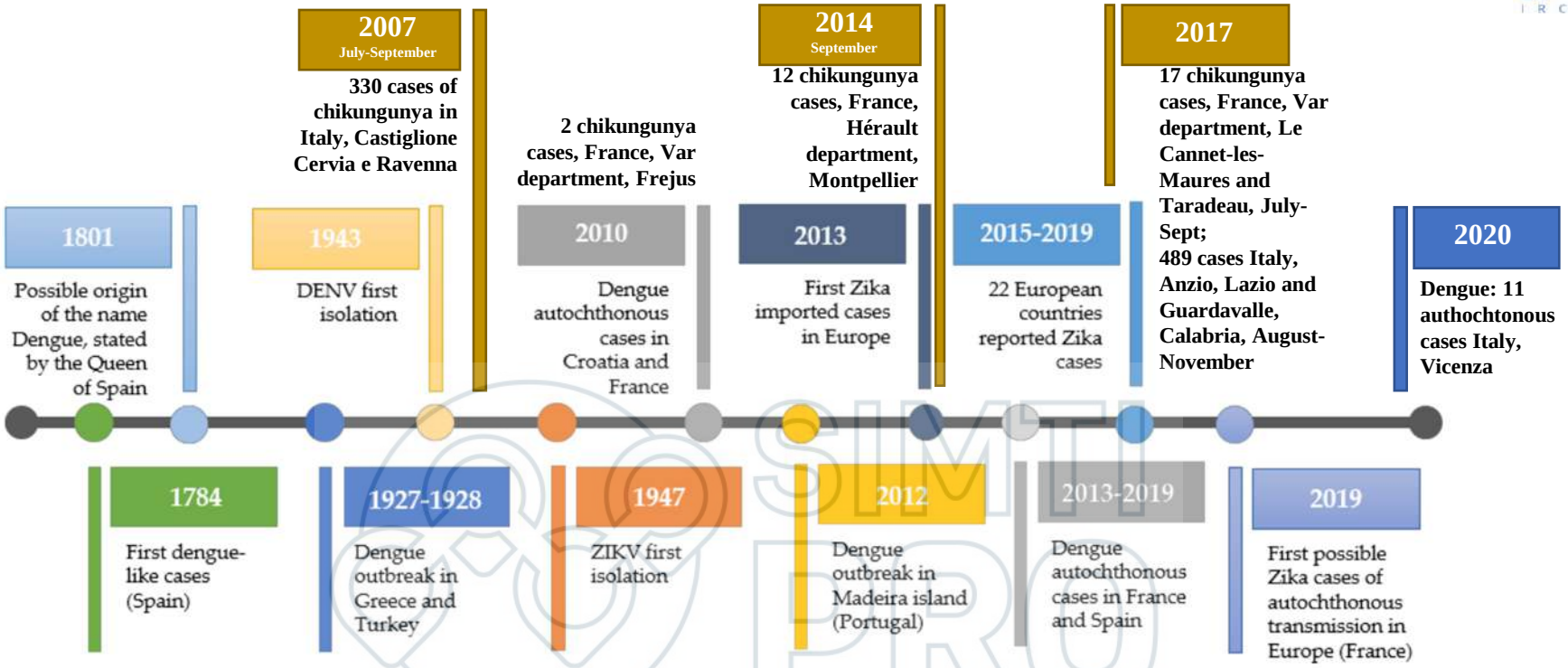
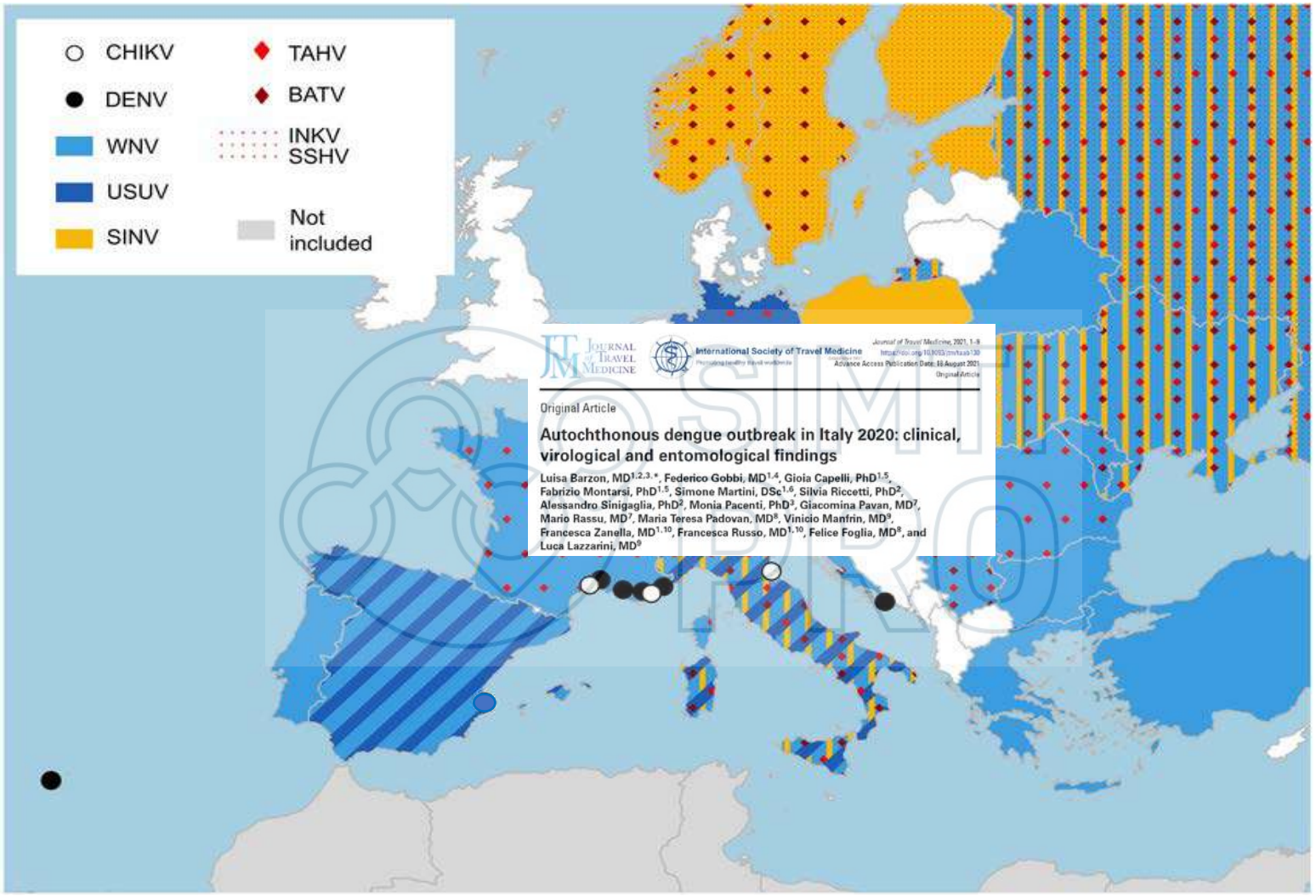


Figure 1. Timeline of dengue and Zika cases in Europe. Dengue has been present in Europe and is considered an emerging threat by the European Center for Disease Control and by the European Union (EU) public health authorities. The mosquito is found in the region, leading to recent outbreaks. Thus, it must be accounted for in terms of public health policies across the EU.

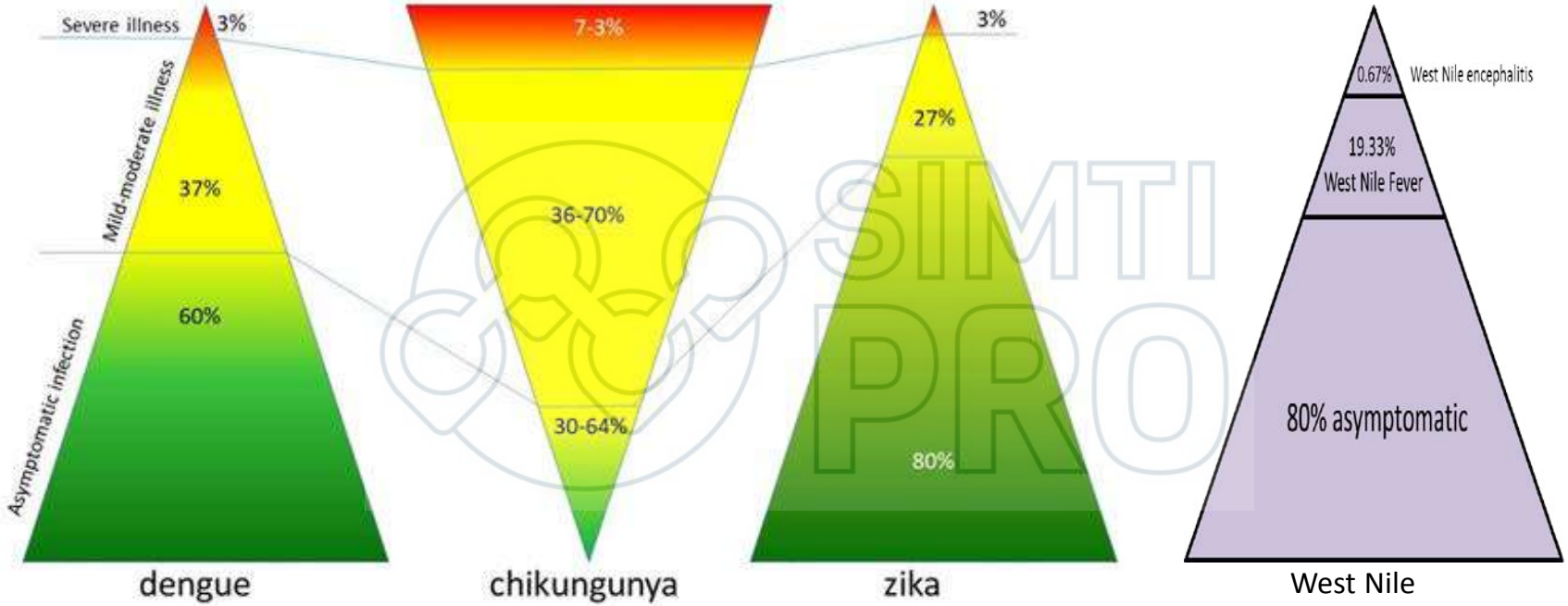
West Nile virus (WNV) in Europe since 1958, Italy 1998. Since 2002 → surveillance, since 2008 circulation of lineage 1 iN ER, Veneto and Lumbary. 14/20 Regions interested.

There is a growing concern for the transmission of arboviral infections by blood transfusion in Europe.

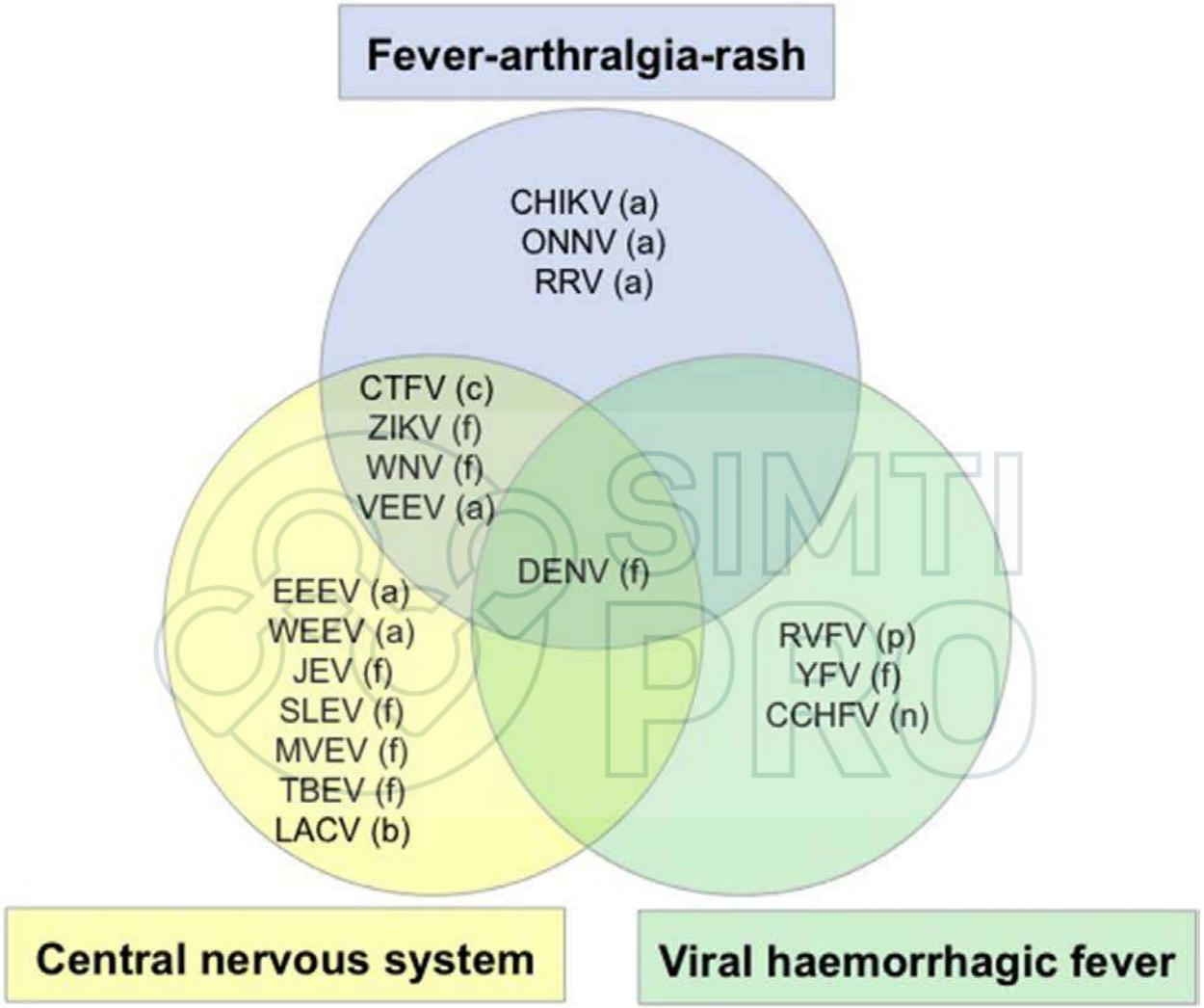


Isolation or direct detection of European arboviruses at country level (map colors), and locations of autochthonous transmission of arbovirus exotic for Europe (circles). Abbreviations: CHIKV, Chikungunya virus; DENV, Dengue virus; WNV, West Nile virus; USUV, Usutu virus; SINV, Sindbis virus; TAHV, Tahyna virus; BATV, Batai virus; INKV, Inkoo virus; SSHV, Snowshoe Hare virus.

Differences in clinical manifestations of arboviral infections



Eligio-García L, Crisóstomo-Vázquez MdP, Caballero-García MdL, Soria-Guerrero M, Méndez–Galván JF, et al. (2020) Co-infection of Dengue, Zika and Chikungunya in a group of pregnant women from Tuxtla Gutiérrez, Chiapas: Preliminary data. 2019. PLOS Neglected Tropical Diseases 14(12): e0008880. https://doi.org/10.1371/journal.pntd.0008880



Summary of arbovirus syndromes together with fever: central nervous system, fever arthralgia rash and viral haemorrhagic fever. (a) alphavirus, (c) coltivirus, (f) flavivirus, (b) bunyavirus, (n) nairovirus and (p) phlebovirus. CCHF, Crimean Congo haemorrhagic fever; CHIKV, chikungunya; CTFV, Colorado tick fever; DEN, dengue; EEEV, Eastern equine encephalitis; JEV, Japanese encephalitis; LACV, La Crosse virus; MVEV, Murray Valley encephalitis; ONNV, O'nyong-nyong virus; RRV, Ross River fever; RVFV, Rift Valley fever; SLEV, St Louis encephalitis; TBEV, tick-borne encephalitis; VEEV, Venezuelan encephalitis; WEEV, Western equine encephalitis; WNV, West Nile fever; YFV, yellow fever; ZIKV, Zika virus. Adapted with permission from Solomon T, chapter 40 in Beeching N, Gill G, eds., Lecture notes: tropical medicine (New York: Wiley; 2014), p. 274.

Arboviral blood supply threat → summary

Table 2
Comparison of relevant vector-borne pathogens

	WNV [3,78,87,114-116]	Dengue [5,83-87,114,117-120]	Zika [4,48,64,65,93,97,121-123]	Chikungunya [54,87,95,96,124]
Family	Flaviviridae	Flaviviridae	Flaviviridae	Togaviridae
Virus characteristics				
Nucleic acid	ssRNA	ssRNA	ssRNA	ssRNA
Envelope	Yes	Yes	Yes	Yes
Year first identified in Americas	1999	1635	2014	2013
Modes of transmission	Mosquitoes (genus *Culex* also *A albopictus*); blood transfusions; organ transplants; exposure in a laboratory setting; from mother to fetus during pregnancy or delivery; from mother to baby during breastfeeding	Mosquitoes (*A aegypti*, *A albopictus*); blood transfusions; organ transplants; from mother to fetus during pregnancy or delivery; exposure in a laboratory setting	Mosquitoes (*A aegypti*, *A albopictus*); sexual contact; from mother to fetus during pregnancy or delivery; exposure in a laboratory setting	Mosquitoes (*A aegypti*, *A albopictus*); exposure in a laboratory setting; from mother to baby during pregnancy or delivery
Possible (unconfirmed) modes of transmission		From mother to baby during breastfeeding	Blood transfusions; from mother to baby during, breastfeeding; saliva; organ transplants	Blood transfusions
% asymptomatic	80%	75%	80%	3%-28%
Incubation period (d)	2-14	4-10	2-14	1-12
Mild clinical symptoms	Fever, headache, body aches, joint pains, vomiting, diarrhea, skin rash, thrombocytopenia	High fever, severe headache, severe eye pain, joint pain, muscle and/or bone pain, skin rash, mild bleeding manifestation (ie, nose or gum bleed, petechiae, or easy bruising), thrombocytopenia, leukopenia	Fever, headache, conjunctivitis, retroorbital pain, joint pain, muscle pain, skin rash, thrombocytopenia	High fever, joint pain, headache, muscle pain, joint swelling, skin rash, thrombocytopenia
Severe clinical manifestations	<1% develop a serious neurologic illness: encephalitis, meningitis, GBS	Dengue hemorrhagic fever (infection causes fluid to leak from small blood vessels, which can lead to profound shock, organ damage, and death) Neurologic disease: GBS, encephalitis	Neurologic disease: GBS, encephalitis, meningoencephalitis	Debilitating arthralgia, myocarditis, ocular disease (uveitis, retinitis), hepatitis, acute renal disease, severe bulbous lesions Neurologic disease: meningoencephalitis, GBS, myelitis, cranial nerve palsies
Complications of maternal fetal transmission	Neurologic disease: chorioretinitis, cerebral abnormalities	Premature birth, hemorrhage during labor, fetal death in utero, late miscarriage, acute fetal distress during labor, neonatal death	Fetal death in utero, intrauterine growth restriction Neurologic anomalies: microcephaly, severe brain damage, intra cranial calcifications, optic nerve atrophy	Neurologic disease: encephalitis, hemorrhagic symptoms, myocardial disease, rare reports of spontaneous abortions
Reported cases of severe illness or death	~10% of people who develop neurologic infection will die	~1% of patients w/ dengue hemorrhagic fever w/ medical care will die	~15 deaths reported (2015-2016) (no mortality incidence available)	~74 deaths (2015-2016) (no mortality incidence available)
No. of transfusion-transmitted cases	35	5	4 suspected[a]	0
FDA guidance to test blood supply	Yes	No	Yes	No
Suspected risk to the blood supply	High	Moderate	Unknown (likely mild)[a]	None

[a] There is uncertainty surrounding the rate of transmissibility and associated clinical penetrance.

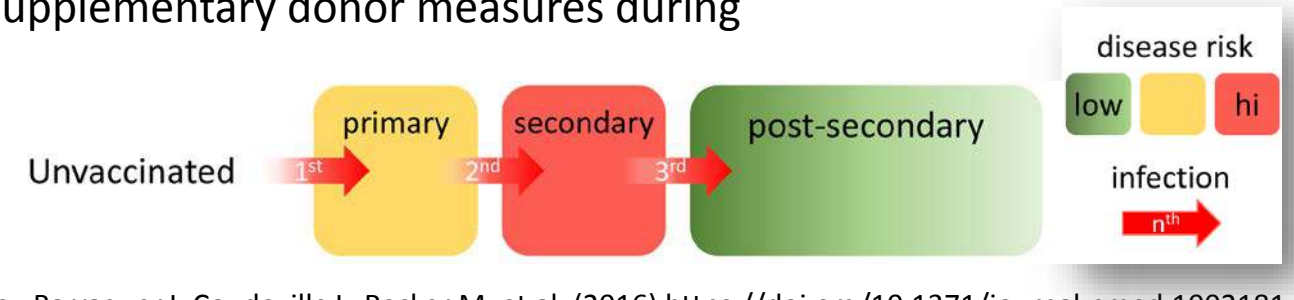
TT Dengue

The rate of asymptomatic DENV infection in blood donors has been determined retrospectively in Puerto Rico.
Nearly 1 in 1000 blood donations were positive for DENV nucleic acid during the 2005 dengue season versus 1 in 600 positive during the 2007 outbreak

The global incidence of dengue has grown dramatically with about half of the world's population now at risk. Although an estimated 100-400 million infections occur each year, over 80% are generally mild and asymptomatic.

For **dengue TT is proven** – severe clinical consequences for recipients are known although general course similar to vector-borne

Dengue TT risk is effectively minimized by rigorous public health response and activation of supplementary donor measures during outbreaks



Flasche S, Jit M, Rodríguez-Barraquer I, Coudeville L, Recker M, et al. (2016) https://doi.org/10.1371/journal.pmed.1002181

Table 2. Présence de marqueurs d'infection active par le virus de la dengue (ARN viral, antigène NS1, anticorps de classe IgM) dans des cohortes de donneurs de sang dans des régions où le virus de la dengue (DENV) circule de façon épidémique). Les références sont dans le texte principal.

Pays (référence)	Année	Taille de l'échantillon	ARN (%)	Sérotype	Ag NS1 (%)	IgM (%)	IgG (%)
Australie (13)	2003	5879	0	ND	NT	NT	NT
Brésil, Sao Paulo, SP (13)	2003	4858	3 (0,06)	DENV-1/3	NT	NT	NT
Honduras (13)	2004-2005	2994	9 (0,3)	DENV-1/2/4	NT	2 (0,07)	4 (0,134)
Porto-Rico (14)	2005	16521	12 (0,07)	DENV-2/3	NT	1 (0,0006)	9 (0,055)
Mexique (15)	2006-2007	800	NT	ND	NT	16 (2.00)	472 (59,0)
Australie (16)	2008-2009		NT	ND	NT		
Queensland		5453				12 (0,22)	(9,43)*
Carins		2416				8 (0,33)	(7,18)*
Townsville		3037				4 (0,13)	(11,48)*
Malaisie (17)	2009-2010	360	NT	ND	NT	15 (4,2)	141 (39,12)
Brésil, Ribeirao Preto, SP (18)	2010	500	2 (0,4)	DENV-3	NT	NT	NT
Singapour (19)	2009-2010	3995	NT	ND	NT	113 (2,83)	2077 (52)
Mexique (20)	2010-2012	2061	NT	ND	NT	23 (1,12)	30 (1,46)
Brésil, Rio de Janeiro, SP (21)	2012	16241	87 (0,54)	DENV-4	NT	(2,8 à 8,8)**	(88,7 à 90,9)**
Inde, Delhi (22)	2012	200	0	ND	NT	27 (13,5)	116 (58)
Inde, Nord du pays (23)	2013	1709	NT	ND	0	NT	NT
Chine, Guangxi (24)	2013-2014	1685	0	ND	NT	6 (0,36)	7 (0,42)
Arabie Saoudite (25)	2014	100	NT	ND	1 (1)	6 (6)	7 (7)
Chine, Guangzhou (26)	2014	3000	2 (0,007)	ND	NT	NT	NT
Chine, Guangzhou (27)	2014	3000	NT	ND	NT	71 (2,40)	NT
Brésil, Ribeirao Preto, SP (28)	2015	631	1 (0,2)	DENV-1	NT	NT	NT
Taiwan (29)	2015	8000	1 (0,013)	DENV-2	0	17 (0,21)	13 (0,16)
Arabie Saoudite (30)	2015-2016	910	50 (5,5)	DENV-1/2/3/4	NT	50 (5,5)	355 (39,01)
Brésil, Campinas, SP (31)	2015	1962	3 (0,15)	ND	NT	NT	NT
	2016	1775	11 (0,62)	ND	NT	NT	NT
Brésil, Ribeirao Preto, SP (32)	2016	475	0	ND	0	32 (6,74)	NT
Inde, Pune (33)	2016-2017	209 en 2016	NT	ND	1 (0,48)	11 (5,3)	157 (75)
		311 en 2017			2 (0,64)	20 (6,4)	271 (87)
Polynésie Française (34)	2012-2018	34000	((0,015)	ND	NT	NT	NT

* Seulement une partie des sérums a été testé pour la présence des IgG.
** Les deux séries de résultats correspondent à des échantillons prélevés à la phase précoce et à la phase tardive de l'épidémie.
NT : non testé ; ND : non déterminé.

Haut Conseil de la santé publique

Haut Conseil de la santé publique

AVIS

relatif aux mesures de prévention à appliquer aux produits issus du corps humain, produits sanguins labiles, cellules, tissus et organes dans les territoires français d'Amérique dans une situation d'intensification de la circulation du virus de la dengue

16 janvier 2020

Dengue: measures to prevent TT

Table 4. Options for minimizing dengue risk in the blood supply

Strategies	Endemic countries	Non-endemic countries
No specific measures taken for dengue	Risk of transfusion-transmitted dengue increased, dependent on prevalence in donor population and proportion of donors with asymptomatic infection No direct cost to blood service, but indirect cost from patient morbidity from transfusion-transmitted infection and loss of confidence in blood supply safety	Risk of transfusion-transmitted dengue low, dependent on proportion of donor population who may recently be exposed to dengue infection through travel No direct cost to blood service, but indirect cost from loss of confidence in blood supply safety in event of a transfusion-transmitted infection occurring
Donor qualification – deferral of at-risk donors, e.g. symptoms of fever, travel history, exposure to dengue patients, etc.	Deferral based on exposure not feasible when disease is endemic, unable to exclude early and asymptomatic infection Nonspecific, leads to high donor loss Low cost-effectiveness	Deferral based on exposure feasible, able to reduce risk of accepting donations from early and asymptomatic infected donors Low donor loss, dependent on proportion of donor population likely to travel to endemic countries Cost-effective
NAT testing of donations for dengue	Able to detect asymptomatic infection Donor loss dependent on specificity of test system Expensive Cost-effectiveness depends on prevalence of asymptomatic infected donors	Able to detect asymptomatic infection Donor loss dependent on specificity of test system Expensive Low cost-effectiveness
Pathogen reduction	Able to reduce transmission risks Expensive and only available for platelets and plasma currently. May result in reduced product yields Low cost-effectiveness for dengue alone Increased cost-effectiveness depends on ability to reduce risks of other transfusion-transmitted diseases as well	Able to reduce transmission risks Expensive and only available for platelets and plasma currently. May result in reduced product yields Low cost-effectiveness for dengue alone Increased cost-effectiveness depends on ability to reduce risks of other transfusion-transmitted diseases as well

Table 3. Dengue and donor deferral

Country	Donor deferral measures for dengue
Singapore*	6 months deferral for history of dengue infection 3 weeks deferral for history of fever No travel-related deferral for dengue
Hong Kong*	6 months deferral for history of dengue infection 2 weeks deferral for history of fever No travel-related deferral for dengue
Sri Lanka*	No specific deferral for history of dengue infection 2 weeks deferral for history of fever No travel-related deferral for dengue
Italy:	28 days deferral after exposure in outbreak areas; 120 days deferral after disease†
New Zealand‡	4 weeks deferral for history of dengue infection No travel-related deferral for dengue
UK‡	2 weeks deferral for history of dengue infection No travel-related deferral for dengue
United States‡	4 weeks deferral for history of dengue infection No travel-related deferral for dengue

*Endemic for dengue.
†Non-endemic except parts of Northern Australia.
‡Non-endemic.

Transfusion Medicine, 2009, **19**, 66–77

Example: dengue in Australia

- In Australia → seasonal ourbreaks in North-East (from <50 to >1000 cases)
- Transfusion risk:
  - Supplementary donor questioning → restriction to plasma donation for fractionation for donor living in or travelling to outbreak area
  - Restrictions active up to 28 days after last case onset date

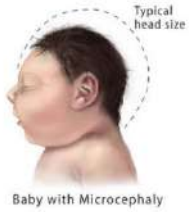
Faddy HM, Seed CR, Fryk JJ, et al. EID 2013;19:787-789

TT Zika

The rate of asymptomatic DENV infection in blood donors has been determined retrospectively in Puerto Rico.
Nearly 1 in 1000 blood donations were positive for DENV nucleic acid during the 2005 dengue season versus 1 in 600 positive during the 2007 outbreak

Zika virus is a mosquito-borne flavivirus that was first identified in Uganda in 1947 in monkeys. Outbreaks of Zika virus disease have been recorded in Africa, the Americas, Asia and the Pacific currently 86 countries).
The first outbreak of Zika virus disease was reported from the Island of Yap (Federated States of Micronesia) in 2007. This was followed by a large outbreak in French Polynesia in 2013 and Brazil in 2015.
Zika found to be associated with Guillain-Barré syndrome and microcephaly (2015).

For **zika TT is possible (detected in blood donations → 2,8% French Pol. outbreak, 0,5% Puerto Rico, 4 TTZ reported in Brazil)** – Consequences: natural infection GBS 24/100000, microcephaly 0,88-13,2% risk. Evidence scares, seems mild.



TT Zika risk is effectively minimized by deferral (note sexual intercourse); PR probably effective (PLT, plasma), product quarantine and donor surveillance, ID-NAT (transplant), recipient selection (no pregnant women)

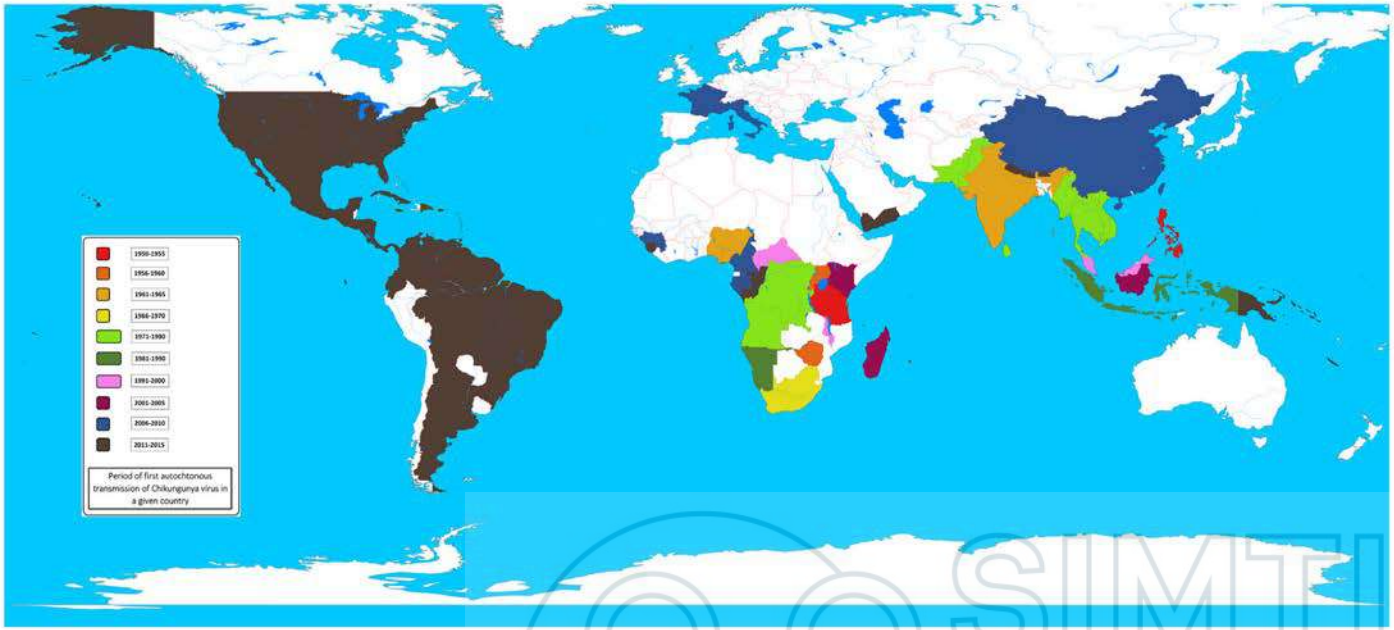


Fig. 1 Chronology of the first autochthonous CHIKV appearance in the different countries

To date, to our knowledge, no case of transfusion-transmitted CHIKV infection has been documented despite reports of presymptomatic and asymptomatic CHIKV infection and despite verified virus-positive blood donations during global epidemics

TT chikungunya

Chiku TT was never recorded (CHIKV detected in blood donation → 0,4% PLT La Reunion. Organ transmission proven, primates transmission proved, probably short viremic period, IgM presence).

Chiku TT risk is effectively minimized by donor selection and deferral, disease frequently symptomatic → product quarantine + post-donation reporting.

Example: chiku in Italy

- 21-day deferral for blood donors who had visited the affected areas,
- Quarantine of blood components for 5 days (subsequently reduced to 2 days),
- And pathogen inactivation of platelet concentrates which ultimately resulted in the loss of 5130 U of red blood cells and 2871 L of fresh-frozen plasma as well as an economic loss exceeding £1.3 million

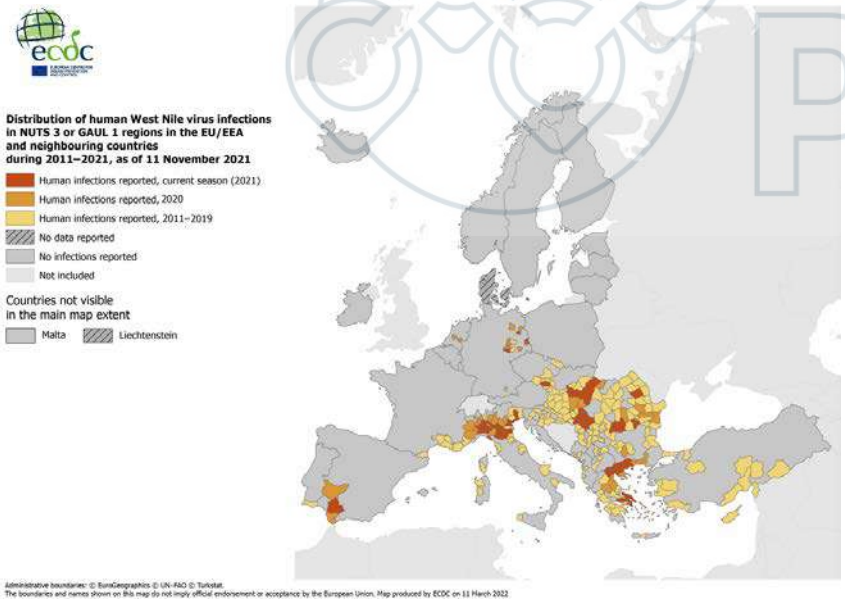
Liumbruno GM, Calteri D, Petropulacos K, et al. The chikungunya epidemic in Italy and its repercussion on the blood system. Blood Transfus 2008;6(4):199–210.

TT WNV - Usutu

2020: From southern, eastern and western Europe, 3,849 WNV human infections and 379 deaths were reported. Most cases occurred between June and October. USA: from 2003 to 2005, >1000 viremic donors were documented and seven cases of probable or confirmed transfusion transmission occurred.

The rate of asymptomatic WNV infections is 80%. Donors can transmit unaware. Studies on blood donors show annual incidence rates ranging from 1.353 to 19.069 cases per 100,000 specimens.
No transfusion-associated USUV infection has been reported. However, the occurrence of USUV among blood donors is not fully determined.

For **WNV TT is proven)** – Consequences: 1% death, 15-20% neuroinvasive diseases



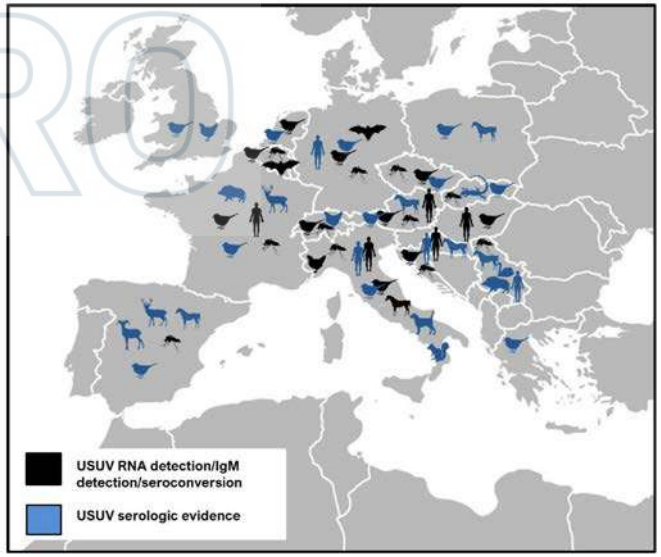


Figure 3. Geographic distribution of Usutu virus in Europe (clinical cases/RNA detection/seroconversion/serologic evidence).

“Piano di sorveglianza delle febbri estive: un modello da continuare a perseguire?”

Linee operative per la
febbri estive in Regione

REGIONE AUTONOMA
FRIULI VENEZIA GIULIA

Piano regionale di sorve
trasmesse da zanzare (*Aed*
virus Chikungunya

Piano Nazionale di prevenzione, sorveglianza e risposta alle Arbovirosi
(PNA) 2020-2025

Novembre 2019

egione Emilia-Romagna
OLLETTINO UFFICIALE
RESSO LA PRESIDENZA DELLA REGIONE - VIALE ALDO MORO 52 - BOLOGNA
14 aprile 2022 N. 105
UNTA REGIONALE 11 APRILE 2022, N. 531
ale di Sorveglianza e Controllo delle Arbovirosi - Anno 2022

Periodo di allerta

La **sorveglianza dei casi importati** di malattia da virus Chikungunya, Dengue e Zika si estende **per tutto l'anno**. Tuttavia, nel periodo di maggiore attività vettoriale il sistema di sorveglianza dovrà essere potenziato (in termini di tempestività e sensibilità) su tutto il territorio nazionale.

Il periodo "standard" di maggiore attività dei vettori in Italia va dal **1 giugno al 31 ottobre.** Questo intervallo di tempo può essere esteso tra **aprile-maggio fino a novembre**, laddove le condizioni climatiche di un determinato anno risultino particolarmente favorevoli per lo sviluppo del vettore.

Si stabiliscono le sinergie

CENTRO NAZIONALE SANGUE

ISTITVTO SVPERIORE DI SANITÀ

ISPRA
Istituto Superiore per la Protezione e la Ricerca Ambientale

Ministero della Salute

cittàsane
rete italiana OMS

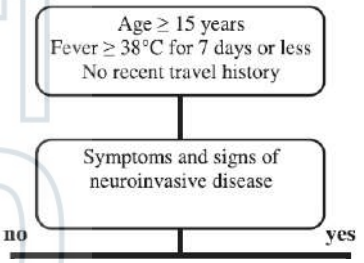
IZSAM G.CAPORALE TERAMO

MINISTERO DELL'AMBIENTE
E DELLA TUTELA DEL TERRITORIO E DEL MARE

Triggers?

	West Nile	Usutu
Criterio clinico	Qualsiasi persona che presenti febbre o almeno una delle seguenti manifestazioni cliniche: - encefalite; - meningite a liquor limpido; - poliradicolo-neurite (simil Guillain-Barré); - paralisi flaccida acuta.	Qualsiasi persona che presenti febbre o almeno una delle seguenti manifestazioni cliniche: - encefalite; - meningite a liquor limpido; - poliradicolo-neurite (simil Guillain-Barré); - paralisi flaccida acuta.
Criteri di laboratorio[1]	Test di laboratorio per caso probabile: - Risposta anticorpale IgM specifica al WNV nel siero; Test di laboratorio per caso confermato (almeno uno dei seguenti): - isolamento del WNV nel siero, nelle urine e/o nel liquor; - identificazione dell'acido nucleico del WNV nel sangue, nelle urine e/o nel liquor; - risposta anticorpale specifica al WNV (IgM) nel liquor; - titolo elevato di IgM WNV e identificazione di IgG WNV nel siero e conferma mediante neutralizzazione.	Test di laboratorio per caso probabile: - Risposta anticorpale IgM specifica all'USUV* nel siero; Test di laboratorio per caso confermato (almeno uno dei seguenti): - isolamento dell'USUV nel siero, nelle urine e/o nel liquor; - identificazione dell'acido nucleico dell'USUV* nel sangue, nelle urine e/o nel liquor; - risposta anticorpale specifica all'USUV (IgM)* nel liquor; - titolo elevato di IgM USUV* e identificazione di IgG USUV nel siero e conferma mediante neutralizzazione.
Classificazione		
Classificazione – Possibile	Non Applicabile	Non Applicabile
Classificazione – Probabile	Persona che soddisfa il criterio clinico ed il criterio di laboratorio per caso probabile.	Persona che soddisfa il criterio clinico ed il criterio di laboratorio per caso probabile.
Classificazione – Confermato	Persona che soddisfa almeno uno dei criteri di laboratorio per caso confermato.	Persona che soddisfa almeno uno dei criteri di laboratorio per caso confermato.

Protocollo
febbri estive



1 WNND : 20 WNF

ifaun

della trasmissione trasfusionale

esemplare di avifauna;
molecolare per WNV in equidi;
da WNV (WNND) o di febbre da

DENV-CHIKV-ZIKA
Which Triggers? Case finding

	Dengue (DENV)
Criterio clinico	- Dengue classica. Qualunque persona che presenti: febbre e almeno 2 dei seguenti sintomi: nausea, vomito, dolore oculare o retro-orbitale, cefalea, esantema cutaneo maculo-papulare, mialgia, artralgie. Sono segni predittivi di dengue grave: dolore a… di fluidi, sanguinamen… irrequietezza. - Dengue grave. dengue … plasmatica che porta a… grave sanguinamento; … elevate ≥ 1000 UI / L, alt…
Criteri di laboratorio[1]	Test di laboratorio per ca… - presenza di anticorpi… Test di laboratorio per… - isolamento virale … dalla comparsa dei… - identificazione di a… - identificazione dell… - identificazione di … siero E conferma c… - sieroconversione … titolo anticorpale … (ad almeno 14 gior…
Criterio epidemiologico	Storia di viaggio o r… trasmissione document…
Classificazione	
Classificazione – Possibile	Persona che soddisfa il cri…
Classificazione – Probabile	Qualsiasi persona che s… laboratorio per caso prob…
Classificazione – Confermato	Persona che soddisfa alm…

	Zika (ZIKV)
Criteri clinici	Una persona che presenta esantema cutaneo … dei seguenti segni o sintomi: • artralgia, • mialgia, • congiuntivite non purulenta/iperemi…
	Test di laboratorio per caso probabile: • rilevamento di anticorpi IgM specifici…

Protocollo febbri estive

Human surveillance

Case definition are reported in Figures 2 and 3. A traveler who had returned within the previous 15 days from endemic countries for DENV or CHIKV, with fever >38°C, absence of leucocytosis (leukocyte count <10,000 μL), and absence of other obvious causes of fever, after ruling out malaria, was considered a possible case of DENV or CHIKV.

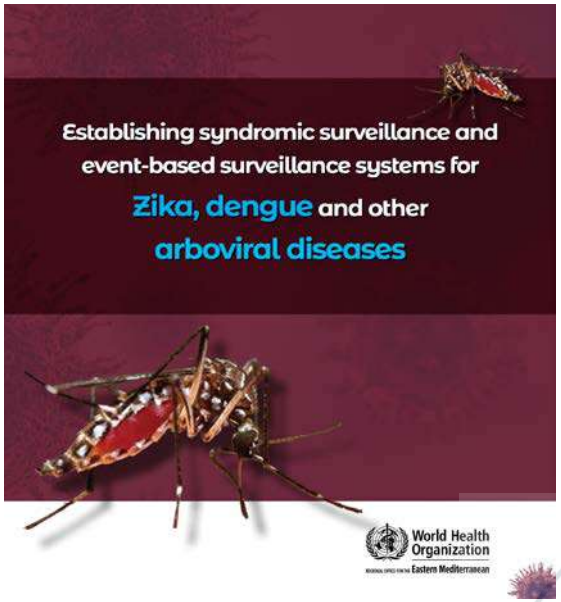
	Classificazione
Classificazione – Caso possibile	Persona che soddisfa il criterio clinico ed epid…
Classificazione - Caso probabile	Qualsiasi persona che soddisfi sia i criteri di caso possibile che i criteri di laboratorio per caso probabile.
Classificazione - Caso confermato	Qualsiasi persona che soddisfi i criteri di laboratorio per caso confermato.

	Chikungunya (CHIK)
Criterio clinico	Esordio acuto di febbre e poliartralgia grave (tale da limitare le normali attività quotidiane), in assenza di altre cause.
Criteri di laboratorio[1]	Test di laboratorio per caso probabile: - presenza di anticorpi di tipo IgM anti-CHIKV in un unico campione di siero. Test di laboratorio per caso confermato (almeno uno dei seguenti): - isolamento virale effettuato su campioni clinici prelevati entro 7 giorni dalla comparsa dei sintomi; … di acido nucleico del CHKV in campioni clinici; … ne da un titolo negativo a positivo, o incremento di 4 volte del … ale per anticorpi specifici anti-CHIKV in campioni consecutivi … giorni l'uno dall'altro); … di anticorpi di tipo IgM anti-CHIKV in un unico campione di … na con test di neutralizzazione.
	… residenza, nelle 2 settimane precedenti, in un'area con … missione di Chikungunya.
	Classificazione
	… fa il criterio clinico ed epidemiologico.
	… che soddisfi sia i criteri di caso possibile che i criteri di … probabile.
Classificazione – Confermato	Persona che soddisfa almeno uno dei criteri di laboratorio per caso confermato.

1 I risultati dei test sierologici devono essere interpretati considerando eventuali precedenti esposizioni ad altri alphavirus e flavivirus.

Case definition

- **CHIKUNGUNYA– DENGUE: Fièvre brutale > 38,5\C d'apparition brutale avec au moins 1 signe parmi les suivants :** céphalée, myalgie, arthralgie, lombalgie, douleur rétro-orbitaire.
- **ZIKA: Eruption cutanée avec ou sans fièvre avec au moins 2 signes parmi les suivants :** hyperhémie conjonctivale, arthralgies, myalgies
- **WEST NILE VIRUS:** tout adulte (≥15 ans) hospitalisé dans l'un des 10 départements du pourtour méditerranéen entre le 1er juin et le 31 novembre, présentant :
  - Un état fébrile (fièvre ≥38,5 °C)
  - ET des manifestations neurologiques de type encéphalite, méningite ou polyradiculonévrite (syndrome de Guillain Barré), ou paralysie flasque aiguë, ayant conduit à la réalisation d'une ponction lombaire avec : un LCR clair (non purulent) sans étiologie identifiée.



Syndromic approach

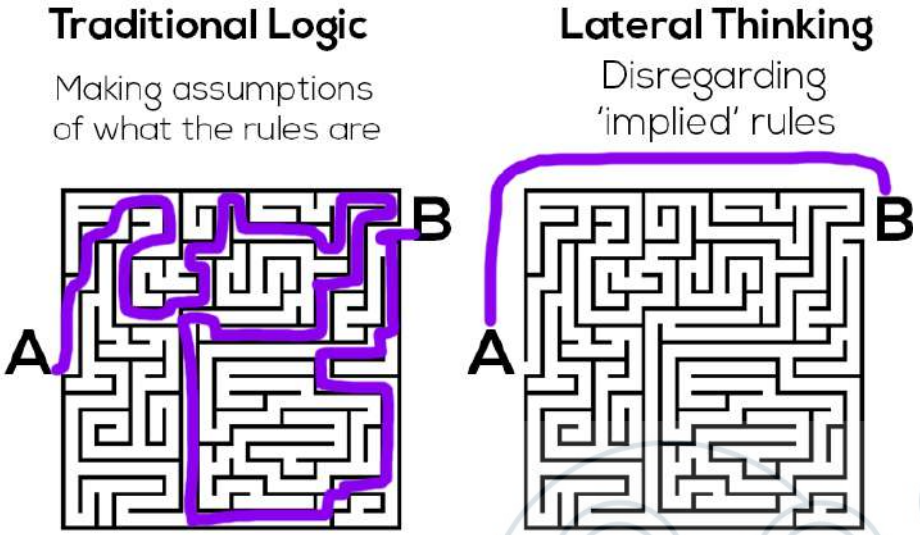
Syndromic surveillance is defined as a method of surveillance that uses health-related data based on clinical observations rather than laboratory confirmation of diagnoses.

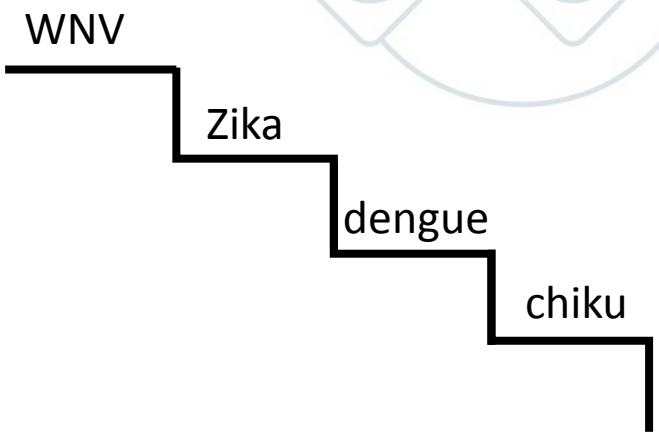
Syndromic surveillance is used to detect outbreaks earlier than would otherwise be possible with methods based on laboratory diagnosis. Case definitions used for syndromic surveillance are based on clinical signs and symptoms rather than on specific laboratory criteria for confirmation of the causative agent.

The syndromic case definition for arboviral diseases could be **fever** AND **at least one of the following** symptoms: myalgia/arthralgia, maculopapular rash, retro-orbital pain, conjunctivitis, headache, vomiting or jaundice + criterio epidemiologico e temporale

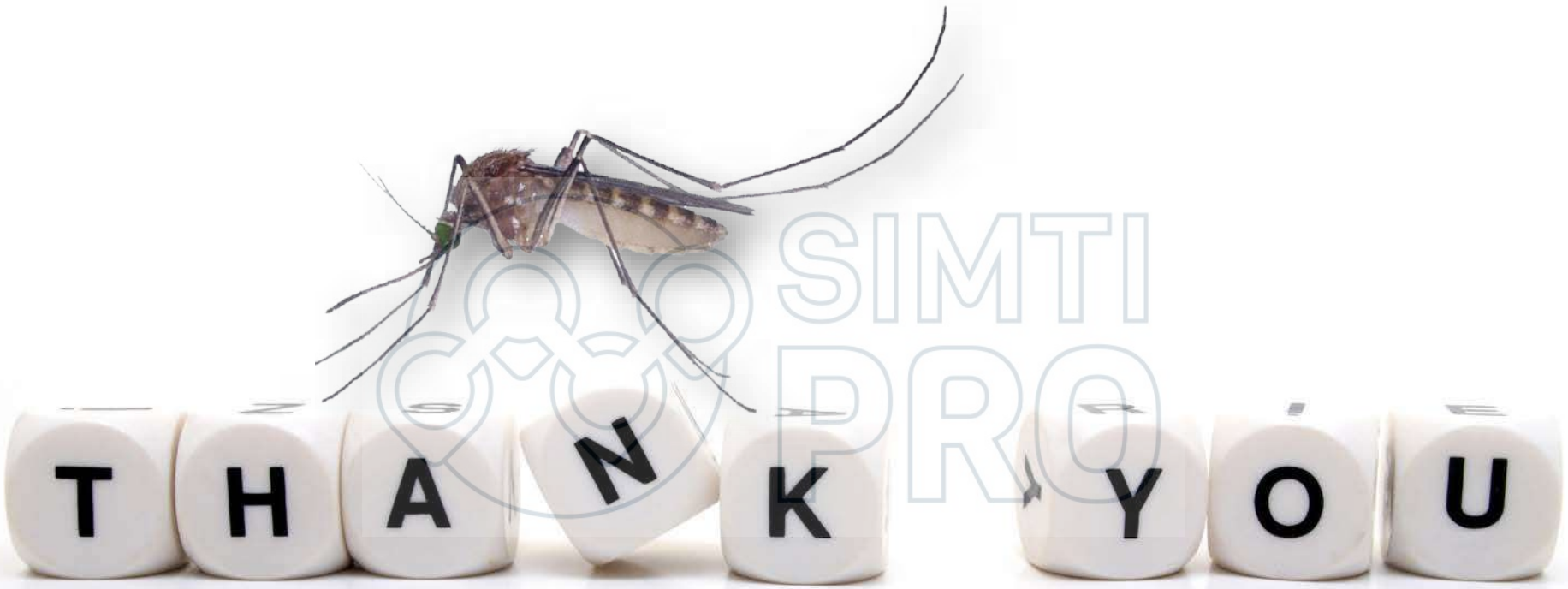
Doubts

- Not proven that diseases caused by mosquito-borne or by transfusion-transmitted arboviruses is equal.
- The apparent lack of significant disease caused by transfusion-transmitted dengue-, zika-, and chikungunya virus, even in immunosuppressed patients, suggests that these viruses need transmission via a mosquito bite to cause disease.
- Before automatically assuming that zika-, dengue-, chikungunya-, and usutu virus necessitate blood safety measures like WNV does, we must study the actual threat they pose to blood safety.
- Necessary evidences on post-transfusion pathology.
- As long ad Italy is not endemic for an arbovirus, public health control measures and geographic-timing donor deferral could be enough?





- Zika: ID-NAT only for 1st trimester pregnant women
- Dengue/WNV/Usutu: stop blood collection in at risk areas during vector activities (promote winter-early spring donation)
- Arboviruses ranking (TTI severity, risk mitigation measures feasibility)



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