

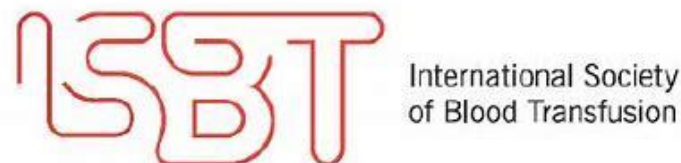
NIHR | Blood and Transplant Research Unit
in Genomics to Enhance Microbiology
Screening at University of Oxford



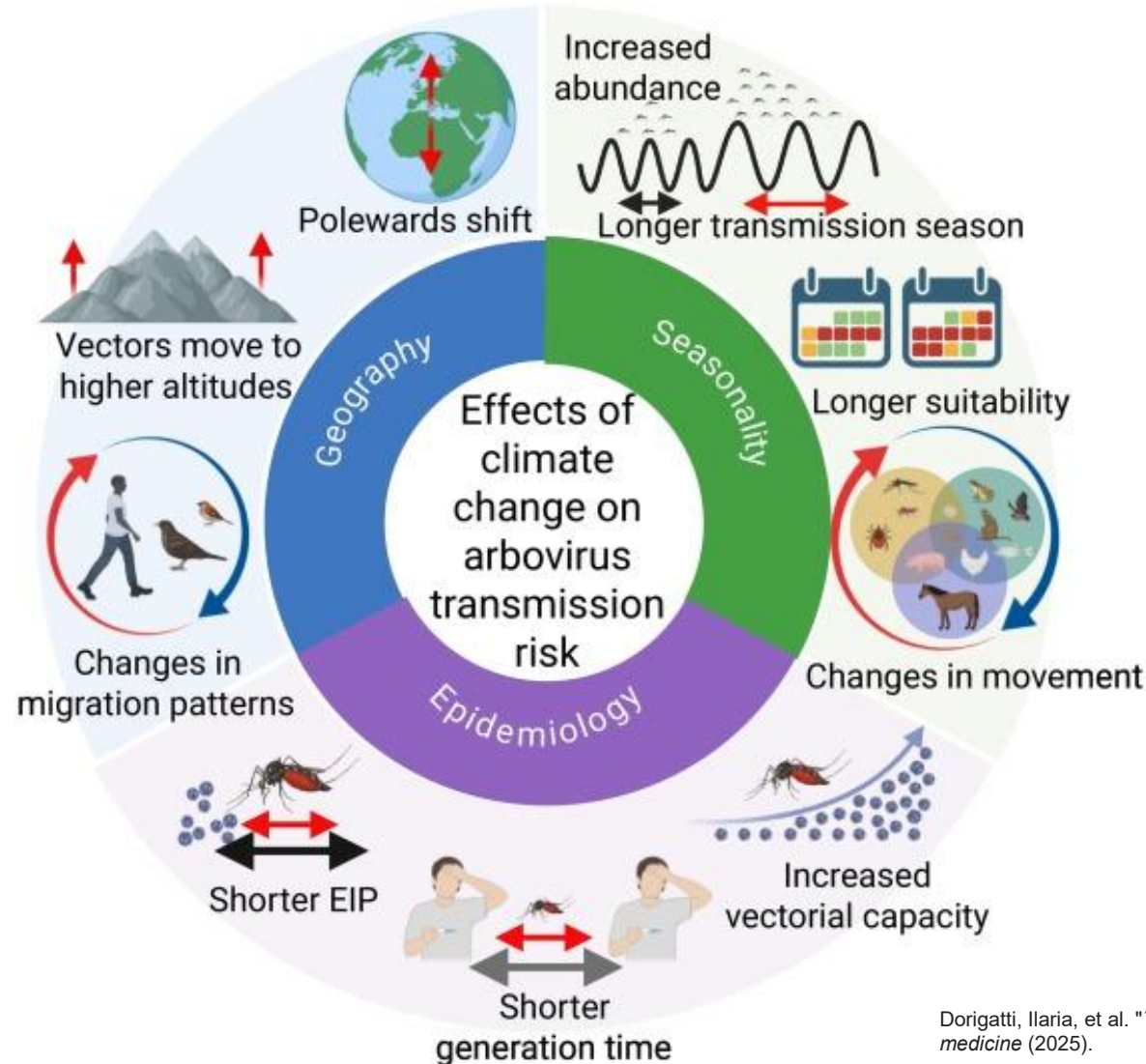
An international study on emerging arboviral infections and blood safety

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IPFA/PEI 32nd International Workshop on Surveillance and Screening of Blood-borne Pathogens



Spread of emerging arboviral infections driven by climate change and globalisation



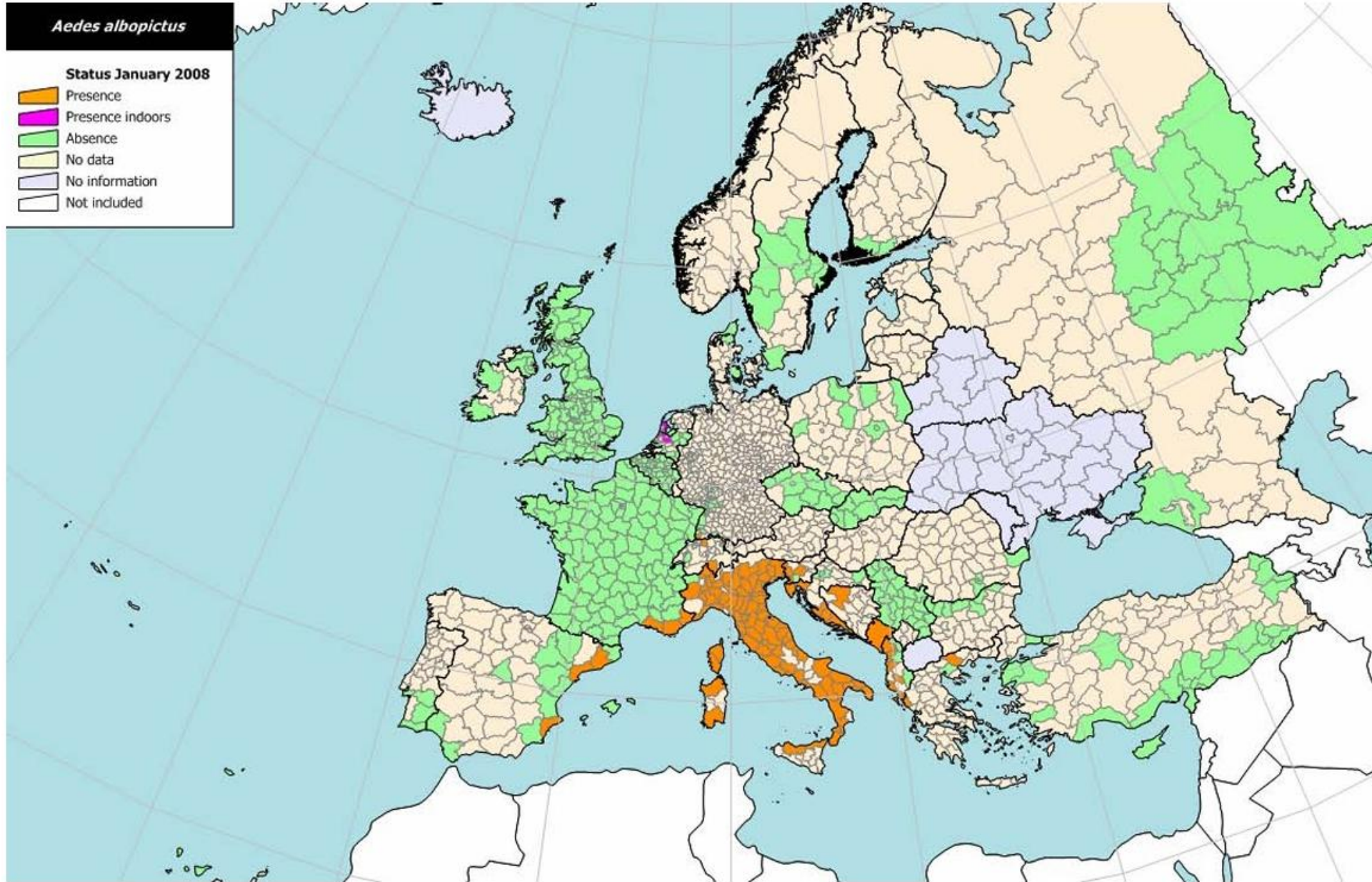
***Culex pipiens* and
Culex modestus
(WNV, USUV)**



***Aedes albopictus*
(DENV, CHIKV,
ZIKV, JEV)**

Dorigatti, Ilaria, et al. "Trends in molecular medicine (2025).

Figure 7: Distribution of *Aedes albopictus* in Europe 2008



***Aedes
albopictus***

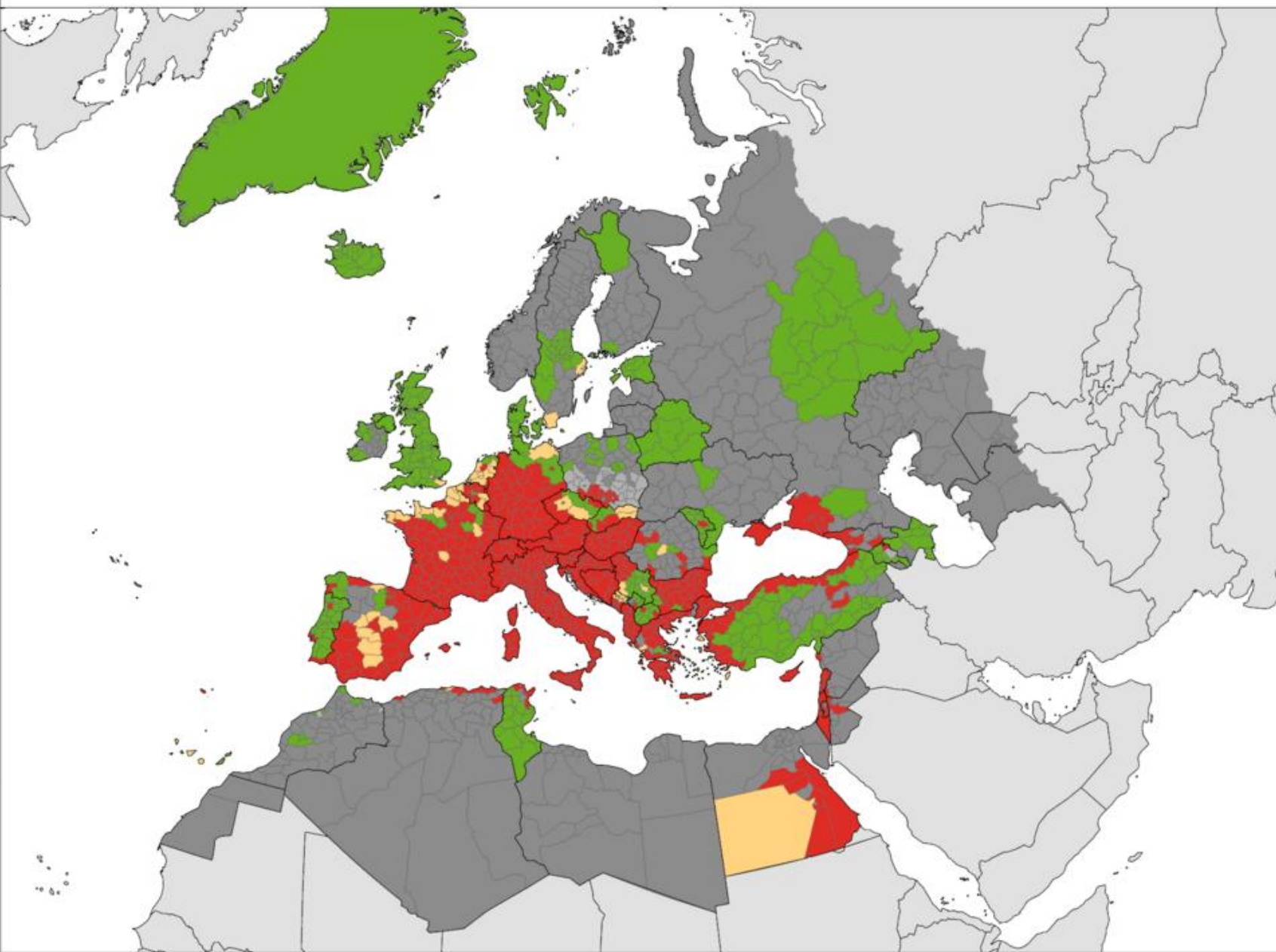
INVASIVE SPECIES

Invasive Status

- Established
- Introduced
- Absent
- No data
- Unknown

Countries/Regions not viewable in the main map scale*

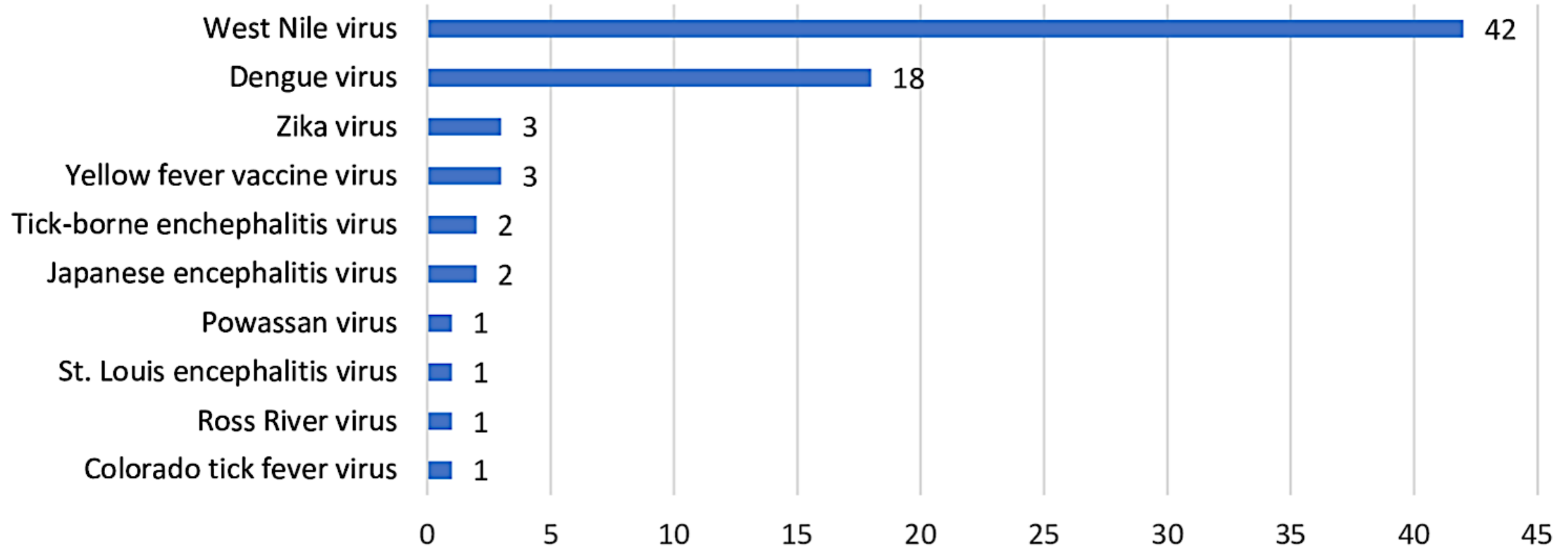
- Malta
- Monaco
- San Marino
- Gibraltar
- Liechtenstein
- Azores (PT)
- Canary Islands (ES)
- Madeira (PT)
- Jan Mayen (NO)



Aedes albopictus established in 369 regions in 16 countries in Europe

Arboviruses: a potential risk for blood safety?

- **Potential transmission via blood transfusion**



Reported transfusion-transmitted arbovirus cases

Giménez-Richarte et al. (2022) Transfusion-transmitted arboviruses: Update and systematic review

How are blood establishments (BE) worldwide addressing challenges caused by rising arboviral infections and their preparedness for future emergence?

Survey sections (data collected for 2024)

- 1) General information on blood establishments and use of pathogen reduction
- 2) Arbovirus screening of blood donations and methods used
- 3) Detection of arboviruses and reported transfusion transmitted cases
- 4) Details of confirmatory testing if applicable
- 5) General deferral strategies of blood donors
- 6) Future concerns for blood establishments



The poster features logos for ISBT (International Society of Blood Transfusion) and NIHR (Blood and Transplant Research Unit in Genomics to Enhance Microbiology Screening at University of Oxford) at the top. It includes icons of a mosquito and a tick on the left, and a blood bag on the right. The main title is 'Emerging arboviral infections and blood safety'. Below the title, it states: 'Survey investigates global blood establishment's arbovirus screening, donor deferral, confirmatory testing and the prevalence of these infections in their country/region.' It lists two criteria: 'Work in a blood establishment' with a green checkmark, and 'Able to spend 10 minutes to contribute data as a co-author?' with a green checkmark. A red text prompt says 'Please participate in our survey!'. A QR code is on the left with the text 'Scan and share the the QR code'. A survey link is provided: 'Survey link: https://app.onlinesurveys.jisc.ac.uk/s/oxford/emerging-arboviral-infections-and-blood-safety-1'. An arrow points from the link to the QR code. At the bottom, it says 'Please submit the survey by 31.05.25.' and shows an illustration of a diverse group of people.

ISBT International Society of Blood Transfusion

NIHR Blood and Transplant Research Unit in Genomics to Enhance Microbiology Screening at University of Oxford

Emerging arboviral infections and blood safety

Survey investigates global blood establishment's arbovirus screening, donor deferral, confirmatory testing and the prevalence of these infections in their country/region.

Work in a blood establishment ✓

Able to spend 10 minutes to contribute data as a co-author? ✓

Please participate in our survey!

Scan and share the the QR code

Survey link:
<https://app.onlinesurveys.jisc.ac.uk/s/oxford/emerging-arboviral-infections-and-blood-safety-1>

Please submit the survey by 31.05.25.

Participating blood establishments in 2024

Blood Establishment	Country	Type of service
Australian Red Cross Lifeblood	Australia	National
Hospital Israelita Albert Einstein	Brazil	Regional
Canadian Blood Services	Canada	National
Hong Kong Red Cross	China	Regional
Instituto Nacional de Salud	Colombia	National
NHS Blood and Transplant	England	National
Finnish Red Cross	Finland	National
German Red Cross	Germany	National
Bavarian Red Cross, Germany	Germany	Regional
Isfahan blood transfusion	Iran	Regional
Japanese Red Cross Society Blood Service	Japan	National
Korean Red Cross Blood services	Korea	National
Sanquin Blood Supply Foundation	Netherlands	National
Institute of Haematology and Transfusion Medicine	Poland	National
National Institute of Blood Transfusion	Romania	National
Pirogov National Medical Surgical Center	Russia	National
King Abdulaziz University Hospital	Saudi Arabia	Regional
South African National Blood Service	South Africa	National
Centro de Transfusion de Madrid	Spain	Regional
Region Skåne	Sweden	Regional
Interregional Blood Transfusion SRC	Switzerland	Regional
Vitalant	USA_1	Regional
American Red Cross	USA_2	Regional

Total population covered was **1.45 billion** and **29.1 million** blood donations collected in 2024

Countermeasures implemented by blood establishments

Donor NAT screening

43% screened for WNV only

Pathogen reduction

52% conducted only

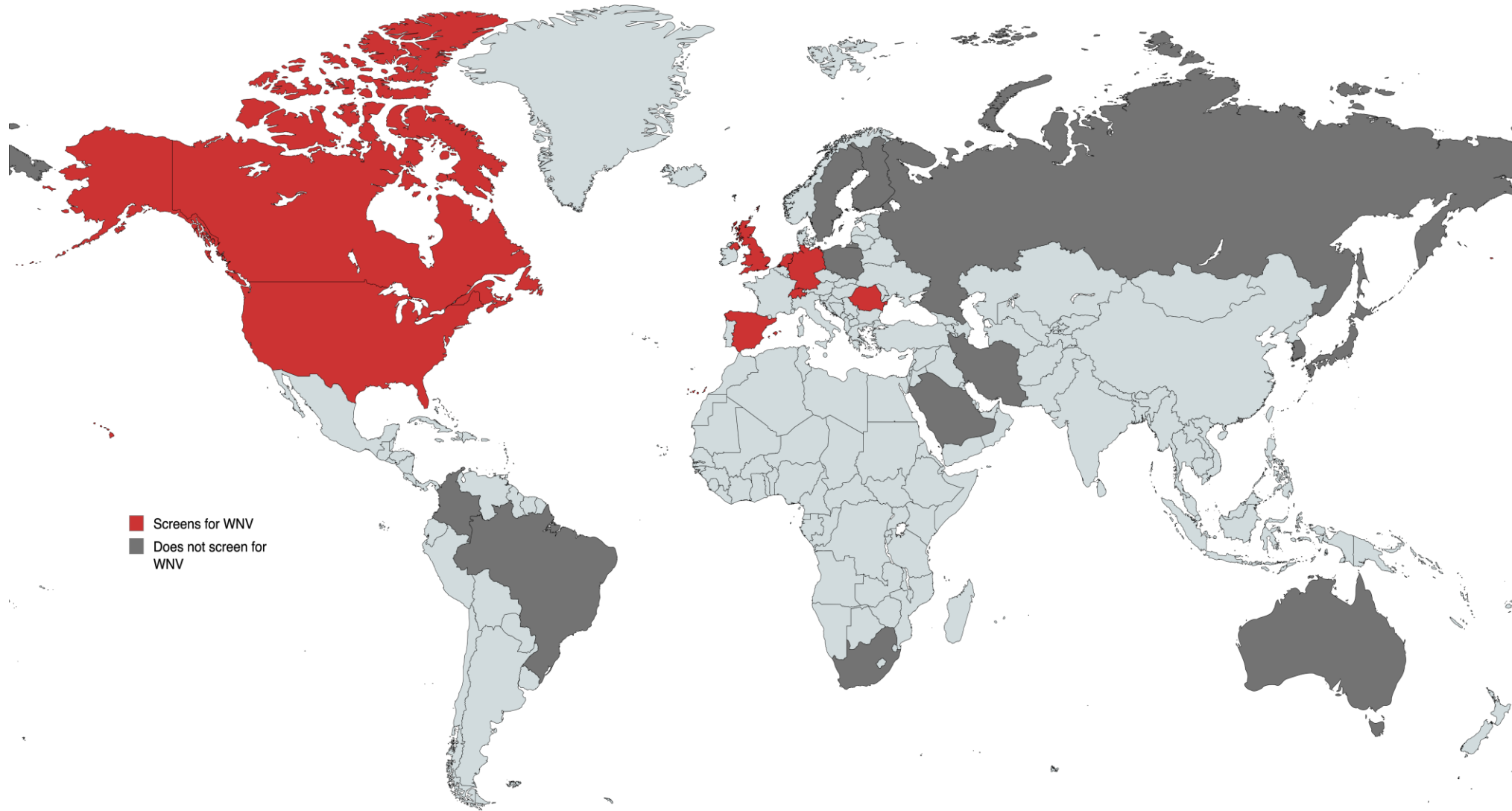
Not yet available for RBC

Donor Deferrals

79% implemented for travel related exposure

No deferrals for USUV and JEV endemic regions

If establishments screen for arboviruses, it is only for WNV



Created with mapchart.net

- Roche Cobas assay used by 10/23 (43%) BE (cross reacts with members of the JEV serocomplex)

Rajendra et al., manuscript submitted

WNV screening methods and confirmatory testing

Country	Assay used for WNV screening	Pool size used for screening	Type of <u>sample</u> used in confirmatory testing for donations found WNV-positive in screening	Type of <u>assay</u> used for confirmatory testing for donations found WNV-positive in screening
Canada	Cobas® ROCHE	6	The same sample and another sample from same donation	Different assay
England	Cobas® ROCHE	6	The same sample	Different assay and sequence positives
Germany	Cobas® ROCHE or GRIFOLS or GFE PoET system	ID, 48, 96	The same sample	Different assay and sequence positives
Netherlands	Cobas® ROCHE	ID	The same sample	Different assay and sequence positives
Romania	Cobas® ROCHE	ID	Another sample from the same donation	Same assay
Spain	Cobas® ROCHE	ID	Another sample from the same donation	Same assay
Switzerland	Cobas® ROCHE	ID	The same sample	Different assay
USA_1	Grifols	ID, 6, 16	Another sample from the same donation	Same assay
USA_2	Grifols	ID, 6, 16	Another sample from the same donation	Same assay

Arboviral infections in blood donors, 2024

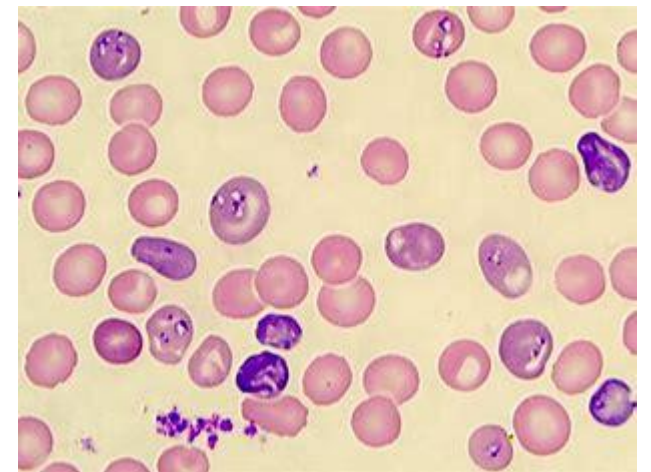
Country	WNV-reactive donations in 2024	Confirmed samples
Canada	16	6 as WNV
England	1	1 as JEV vaccine
Germany	140	37 as WNV 36 AS USUV 1 JEV vaccine
Netherlands	3	3 as USUV
Romania	6	6 as WNV
USA_1	56	46 as WNV
USA_2	167	161 as WNV

Donor deferrals from endemic regions were mainly for WNV, DENV, ZIKV and CHIKV

Country	Donor deferral from endemic regions						Donor deferral period from endemic regions
	WNV	USUV	DENV	ZIKV	CHIKV	JEV	
Australia	Y	N	Y	Y	Y	N	28 days
Brazil	Y	Y	Y	Y	Y	N	30 days
Canada	Y	N	Y	Y	Y	N	21 days
China (Hong Kong)	Y	N	N	N	N	N	28 days
Colombia	Y	N	Y	Y	Y	N	1 month
England	Y	N	Y	Y	Y	N	28 days
Finland	Y	Y	Y	Y	Y	Y	28 days
Germany	Y	N	N	Y	Y	N	28 days
Iran	Y	Y	Y	Y	Y	Y	Unknown
Japan	Y	Y	Y	Y	Y	Y	28 days
Korea	Y	Y	Y	Y	Y	Y	28 days
Netherlands	Y	N	Y	Y	Y	Y	28 days
Poland	Y	N	Y	Y	Y	N	28 days
Romania	Y	Y	Y	Y	Y	Y	28 days
Russia	N	N	N	N	N	N	No response
Saudi Arabia	Y	N	N	N	N	N	120 days
South Africa	N	N	N	N	N	N	N/A
Spain	Y	Y	Y	Y	Y	Y	28 days
Sweden	Y	N	Y	Y	Y	N	28 days
Switzerland	Y	N	Y	Y	Y	Y	28 days
USA_1	N/A						N/A
USA_2							N/A

Future concerns for blood establishments

- Eastern equine encephalitis virus and the California serogroup viruses
- *Rickettsia africae* and *Rickettsia conorii* (Tickbite fever)
- *Babesia* species (mentioned by 3 blood services)
- *Plasmodium* species



Main Findings

- Blood safety protective measures are mostly limited to donor deferrals based on travel history
- Arboviral screening is conducted by BEs in lower prevalence settings in the Northern hemisphere only
- Despite the spread and potential for arboviruses such as DENV, CHIKV and ZIKV to transmit through blood transfusion
 - screening of donors for these pathogens is not currently conducted
- This study highlights the importance of capacity building and preparedness strategies by blood establishments

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