V EDICIÓN JORNADA CIENTÍFICA
Gesitra-IC
ACTUALIZACIÓN EN LA PATOLOGÍA INFECCIOSA
DE PACIENTES INMUNOCOMPROMETIDOS

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MADRID

Emerging and Imported Infections in Solid Organ Transplant Recipients

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6th March 2026

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Gesitra-IC
Grupo de Estudio de Infección en el Trasplante y el Huésped Inmunocomprometido

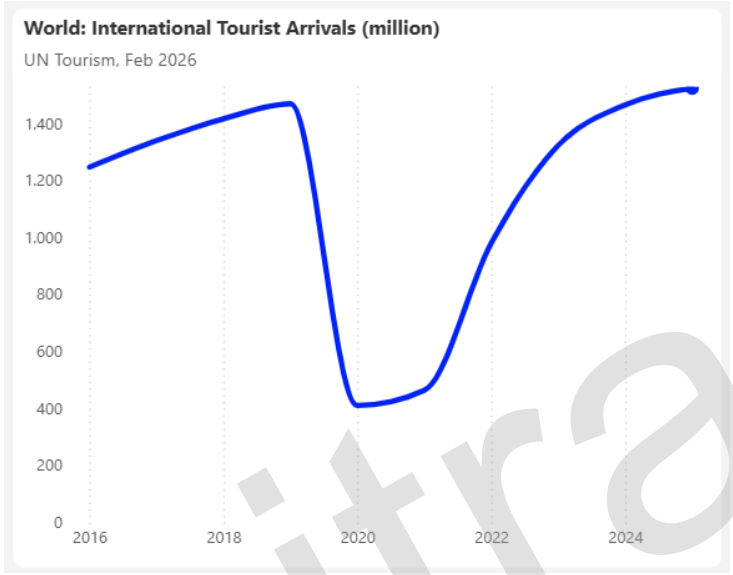
- Disclosures:
  - Speaker fees/served as a consultant for Takeda, Bavarian Nordic, MSD

Agenda

01	Introduction
02	Emerging viral infections
03	Geographically-restricted bacterial infections
04	Endemic mycoses
05	Parasitic Infections in SOT
06	Traveling after transplantation
07	Recommendations and Conclusions

Introduction

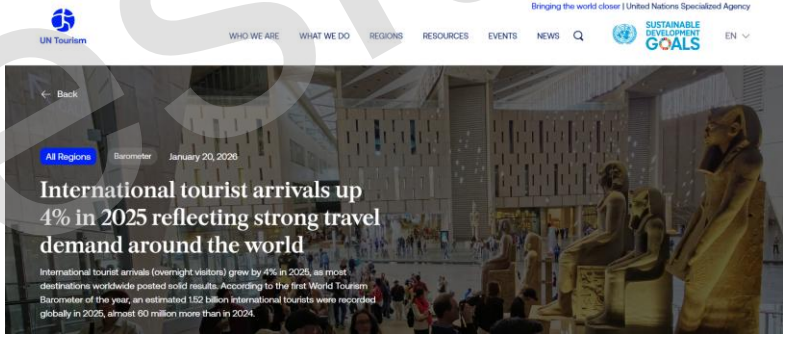
Increased global mobility: international travel

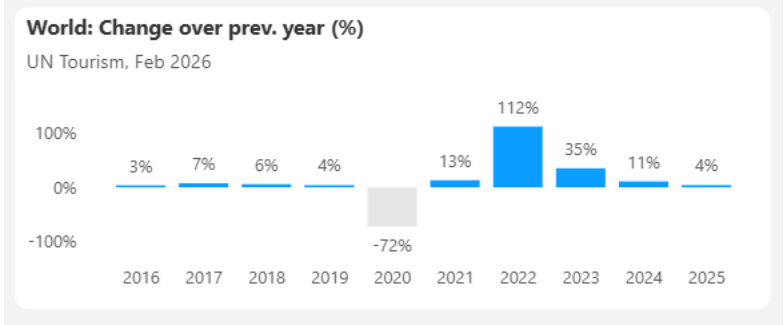


Africa sees strongest results in 2025; Asia and the Pacific rebounds

The World Tourism Barometer by UN Tourism provides comprehensive data for the sector by region, sub-region and destination. Key takeaways from this edition show:

- **Europe**, the world's largest destination region, recorded 793 million international tourists in 2025, a 4% increase from 2024 and 6% more than in 2019. Western Europe (+5%) and Southern Mediterranean Europe (+3%) saw robust performance. Central and Eastern Europe rebounded strongly (+6%) though arrivals remained 9% below 2019 levels.
- The **Americas** (218 million) recorded 1% growth last year, with mixed results across subregions. After a strong first half of 2025, the region saw small declines in Q3 and Q4, partly due to weak results in the United States. South America (+7%) and Central America (+5%) led results by subregion. Some destinations in the Caribbean (+0%) were affected by Hurricane Melissa in the last quarter of the year.
- **Africa** (81 million) saw an 8% increase in arrivals in 2025, with particularly strong results in North Africa (+11%).
- The **Middle East** recorded 3% growth in 2025, equivalent to 39% above pre-pandemic levels, the strongest results relative to 2019. The region virtually reached the mark of 100 million international visitors in 2025.
- Arrivals in **Asia and the Pacific** (331 million) grew 6% last year but are still 9% below 2019 levels as the region continued to rebound. North-East Asia led performance with 13% growth over 2024, while South Asia recovered pre-pandemic levels.





Source: UNWTO, access February 2026

Increased global mobility: migration

Key migration data at a glance

(latest available)

International migrants[a]

281 million

international migrants globally in 2020, or 3.6 per cent of the world's population

Females[a]	135 million	**international female migrants** globally in 2020, or 3.5 per cent of the world's female population
Males[a]	146 million	**international male migrants** globally in 2020, or 3.7 per cent of the world's male population
Children[a]	28 million	**international child migrants** globally in 2020, or 1.4 per cent of the world's child population
Labour migrants[b]	169 million	**migrant workers** globally in 2019
Missing migrants[c]	Around 8,500	**dead and missing** globally in 2023

- McAuliffe, M. and L.A. Oucho (eds.), 2024. World Migration Report 2024. International Organization for Migration (IOM), Geneva

Emerging Infections in Solid Organ Transplant (SOT) recipients

1

Donor-derived infections (DDI): D→ R

2

Exposure endemic areas: immunosuppressed traveler→ **acute infection**

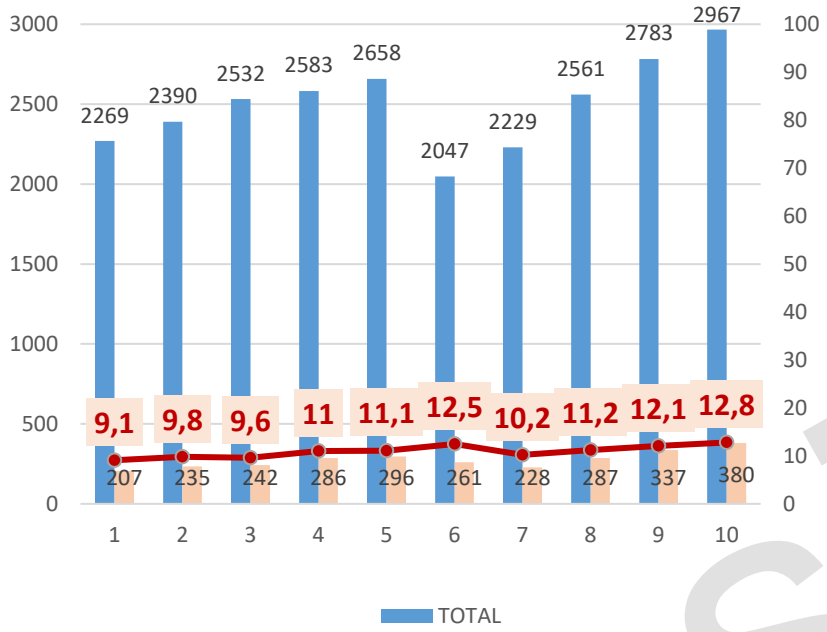
- ***Caution: VFRs***

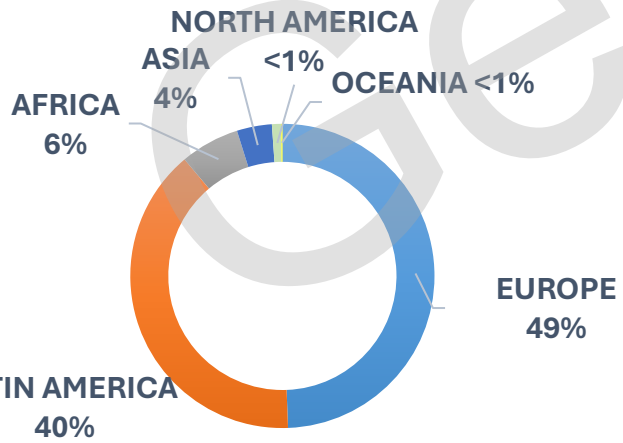
3

Reactivation in context of immunosuppression→ after months/years

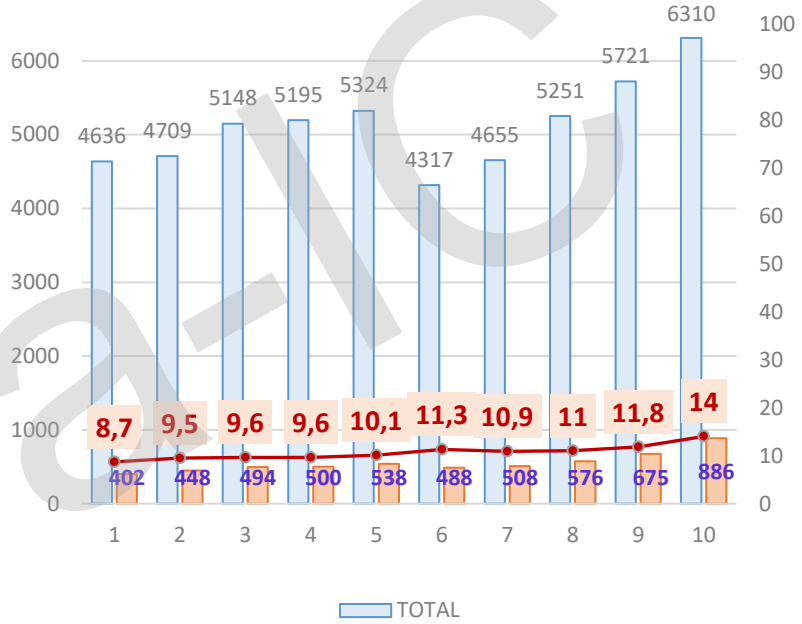
Foreign-born donors/recipients as proportion of total/year (2015-2024) and geographical area of origin

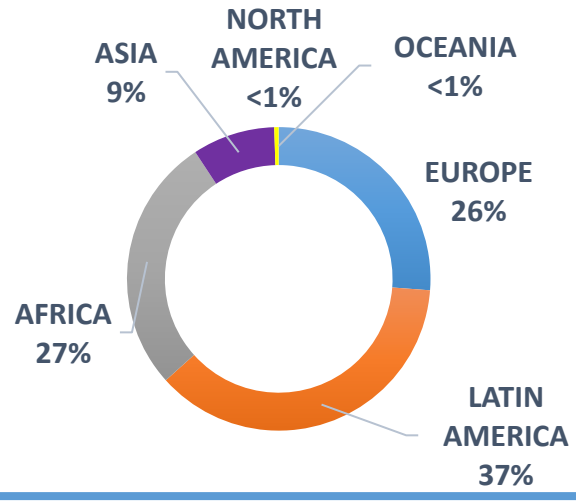
Foreign-born donors (n=2759)



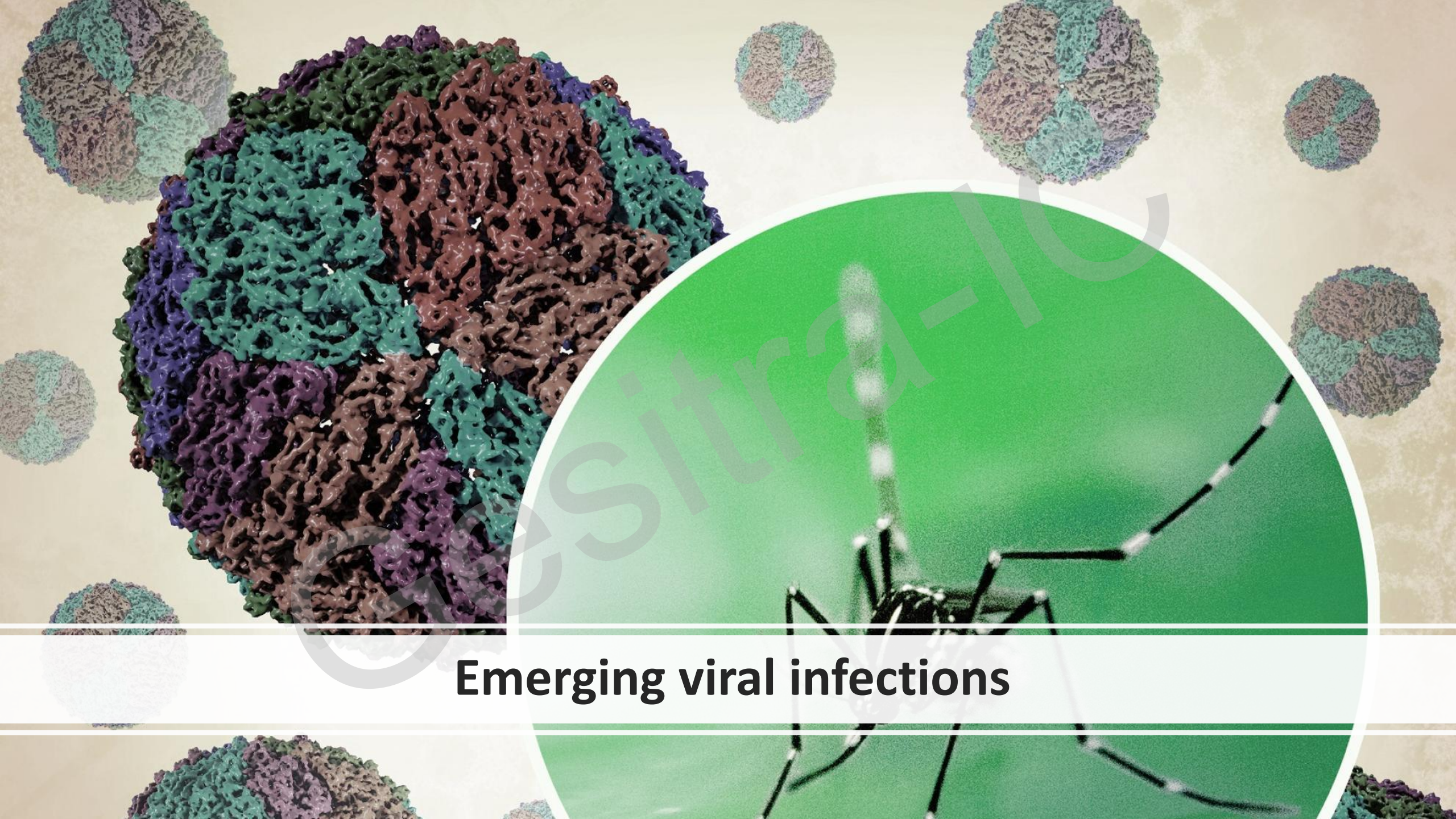


Foreign-born recipients (n=5515)





Accepted oral communication ESCMID 2026



Emerging viral infections

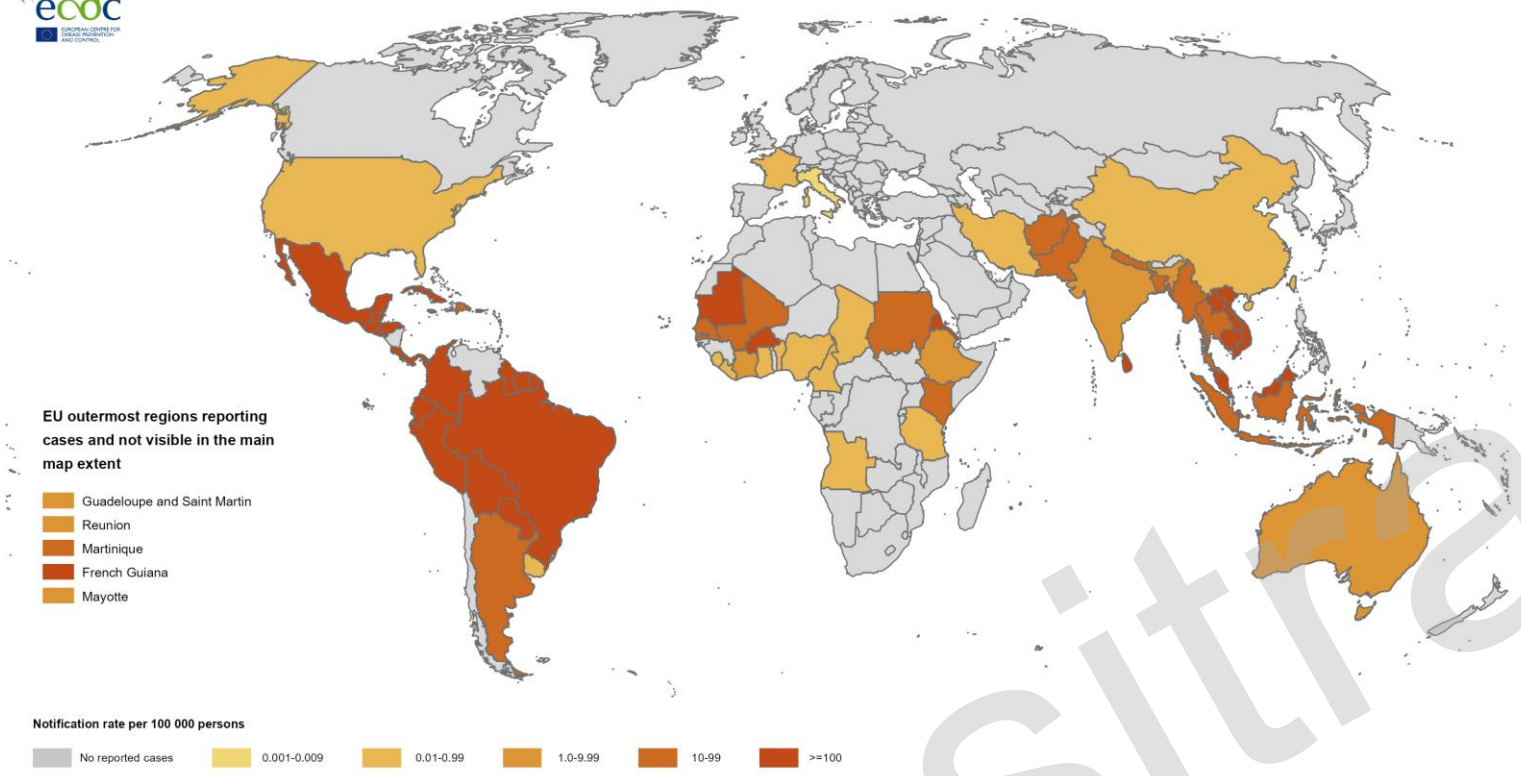
Clinical Case

- 38-year-male, right lobe living donor liver transplant for HBV–related cirrhosis
- Donor was 19-year-old son.

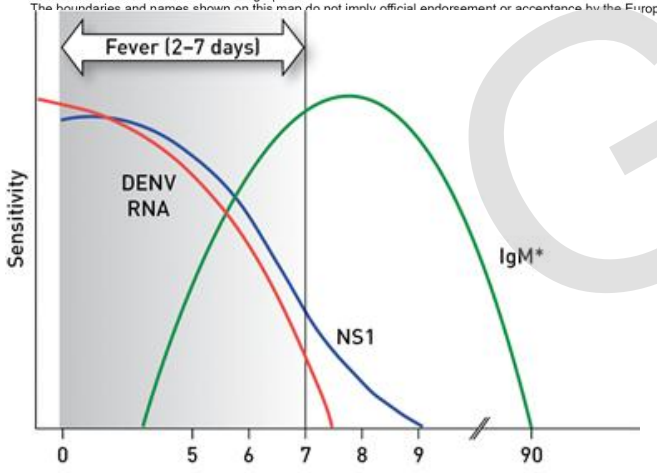
- Immunosuppression: methylprednisolone, tacrolimus, mycophenolate
- Postoperative day 6: fever, thrombocytopenia, severe graft dysfunction
- Liver biopsy: functional cholestasis, without acute rejection
- Hepatitis A and E negative.
- Blood tested positive for ……..

- Donor also had fever after the operation (without abnormal liver function or thrombocytopenia), ……also positive
- Both recipient and donor positive for same serotype of dengue virus RNA by RT-PCR

Saigal et al, Liver Transpl, 2013



Note: Data refer to dengue cases reported in the last 12 months (February 2025-January 2026) [Data collection: February 2026]
Case numbers are collected from both official public health authorities and non-official sources, such as news me
Administrative boundaries: © EuroGeographics
The boundaries and names shown on this map do not imply official endorsement or acceptance by the European



CRITERIA FOR DENGUE ± WARNING SIGNS

Probable dengue
live in /travel to dengue endemic area.
Fever and 2 of the following criteria:
- Nausea, vomiting
- Rash
- Aches and pains
- Tourniquet test positive
- Leukopenia
- Any warning sign

Laboratory-confirmed dengue
(important when no sign of plasma leakage)

Warning signs*
- Abdominal pain or tenderness
- Persistent vomiting
- Clinical fluid accumulation
- Mucosal bleed
- Lethargy, restlessness
- Liver enlargment >2 cm
- Laboratory: increase in HCT concurrent with rapid decrease in platelet count

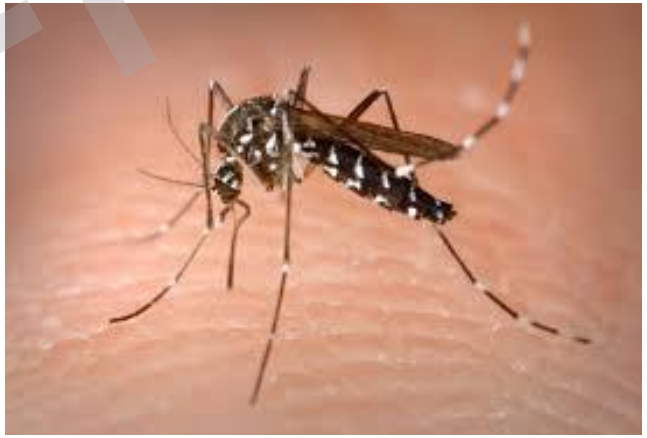
*(requiring strict observation and medical intervention)

CRITERIA FOR SEVERE DENGUE

Severe plasma leakage
leading to:
- Shock (DSS)
- Fluid accumulation with respiratory distress

Severe bleeding
as evaluated by clinician

Severe organ involvement
- Liver: AST or ALT >=1000
- CNS: Impaired consciousness
- Heart and other organs



Dengue

Dengue donor derived infections (DDI)

- Documented in kidney, liver, and heart transplant recipients
- In some, evidence circumstantial or transmission via blood products could not be excluded
- Difficult to establish DDI in endemic areas if same strain circulating

Gajurel et al, Viruses, 2025; Saigal et al, Liver Transpl. 2013; Rosso et al, Br J Infect Dis, 2018; Shaji Mathew et al, Am J Transpl, 2019; Cowan et al, JTM; 2025

Dengue DDI

- DDI usually in first 10 days after transplantation
- Range: asymptomatic disease +/- laboratory abnormalities (investigation other recipients from same donor) to severe/fatal
- DDI in liver transplantation: five of six recipients had severe dengue; two died

Type of patient	Cases	Severe dengue	Mortality
HSCT	3	3/3 (100%)	2/3 (67%)
SOT	23	11/23 (48%)	3/23 (13%)
• Renal	16	5/16 (31%)	1/16 (6%)
• Liver	6	5/6 (83%)	2/6 (33%)
• Heart	1	1/1	0/1

Gajurel et al, Viruses, 2025; Saigal et al, Liver Transpl. 2013; Rosso et al, Br J Infect Dis, 2018; Shaji Mathew et al, Am J Transpl, 2019; Jayant et al, Exp. Clin. Transplant., 2022; Cowan et al, JTM, 2025; Aceves-Sanchez et al, AJTMH, 2025

Dengue in SOT

Clinical features generally similar (fever, headache)

Arthralgia uncommon, may be due to immunosuppression

Series of renal transplant recipients: pleural effusions and ascites more frequent

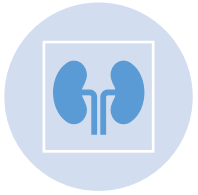
Degree of graft dysfunction common during the illness; only minority develop graft failure

Duration thrombocytopenia can be more prolonged; also **prolonged viremia**

Bleeding at allograft sites, graft nephrectomy reported in severe cases

Weerakkody et al, BMC Nephrol. 2017, Gajurel et al, Viruses, 2025; Ribeiro et al, J Bras Nefrol 2022; Park et al, Transpl Proc, 2008; Shankar et al, Ind J Nephrol, 2024; Fernandes et al, World J Tranpl, 2017; Tan et al, Singapore Med J, 2021; Nasim et al, Transpl Inf Dis, 2013; Azevedo et al, Transplnatation, 2007

Dengue in SOT



Unusual complications: colitis, myocarditis, pericardial effusion, cholecystitis, and hemophagocytic lymphohistiocytosis

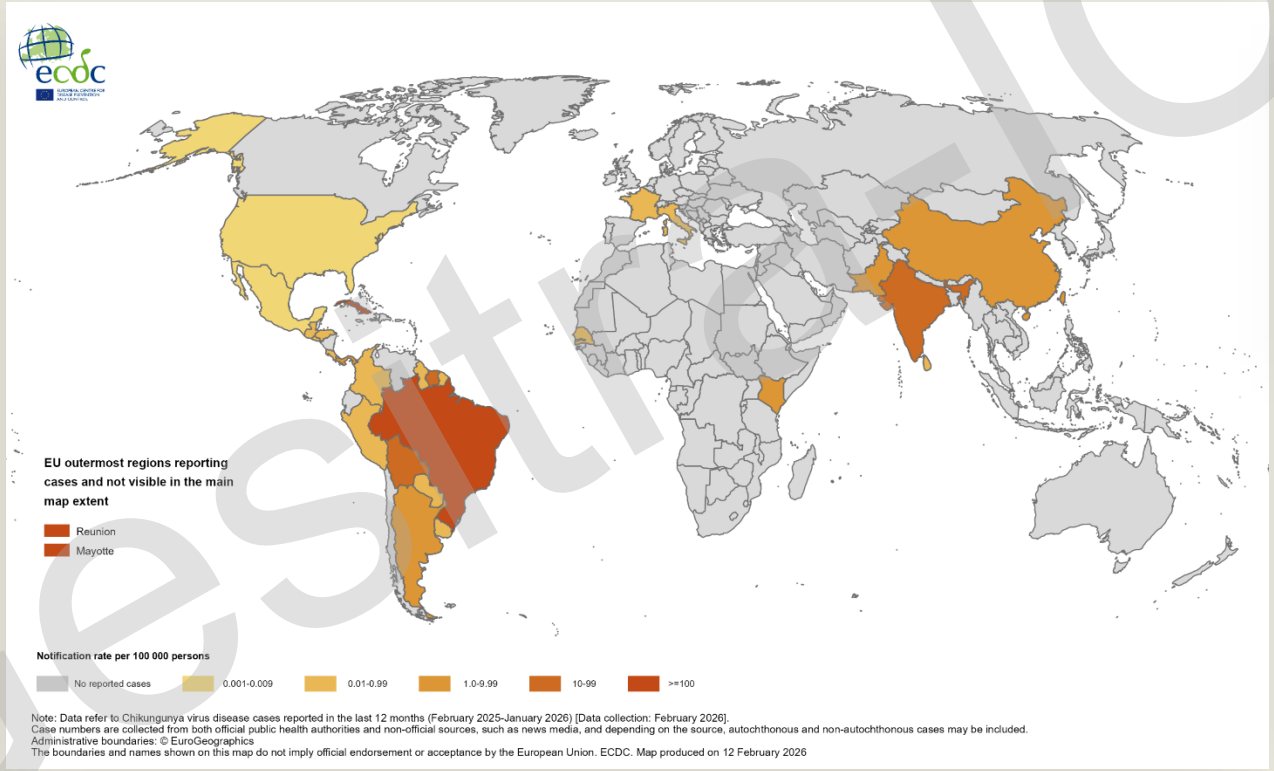
Overall favorable outcome

(Meta-analysis incidence severe dengue and mortality higher; 8.9% vs 3.7%, p = 0.031).

Immunosuppression type does not seem to affect mortality; possible protective effect of cyclosporine against severe dengue in secondary cases

Weerakkody et al, BMC Nephrol. 2017, Gajurel et al, Viruses, 2025; Ribeiro et al, J Bras Nefrol 2022; Park et al, Transpl Proc, 2008; Shankar et al, Ind J Nephrol, 2024; Fernandes et al, World J Tranpl, 2017; Tan et al, Singapore Med J, 2021; Nasim et al, Transpl Inf Dis, 2013; Azevedo et al, Transplnatation, 2007

Chikungunya



https://www.ecdc.europa.eu/sites/default/files/images/20260212105750_Chikungunya_12_months_rate.png

Chikungunya DDI

- Not documented in SOT
- Infectious CHIKV demonstrated in corneal grafts
- Long-term persistence of CHIKV in joints, muscles, lymphoid organs, and liver of non-human primates
- Suggests possibility of DDI from infected donors

Chikungunya Virus Infection of Corneal Grafts

Thérèse Couderc,[1,2] Nicolas Gangneux,[1,2] Fabrice Chrétien,[3,4] Valérie Caro,[5] Tan Le Luong,[6] Bernadette Ducloux,[6] Hugues Tolou,[7] Marc Lecuit,[1,2,8,a] and Marc Grandadam[7,9,a]

[1]Microbes and Host Barriers Group, [3]Unité Histopathologie humaine et modèles animaux, [5]Plateforme de Génotypage des pathogènes et Santé Publique, and [9]Centre National de Référence des Arbovirus, Institut Pasteur, [2]Inserm avenir U604, and [8]Université Paris Descartes, Assistance Publique-Hôpitaux de Paris, Service des Maladies Infectieuses et Tropicales, Hôpital Necker-Enfants Malades, Paris, [4]AP-HP, Groupe Hospitalier Albert Chenevier-Henri Mondor, Département de Pathologie, Faculté de Médecine, Université Paris XII, Créteil, [6]Agence de la Biomédecine, coordination interrégionale, Lyon, and [7]IRBA-IMTSSA, Unité de Virologie tropicale, Laboratoire associé au CNR des arbovirus, Marseille, France

(See the editorial commentary by Long and Heise, on pages 806–7.)

Background. Chikungunya virus (CHIKV) is an arbovirus with a high potential to spread globally. We investigated whether CHIKV is transmittable via corneal grafts.

Methods. Serum specimens from 69 potential corneal donors living in La Réunion during the 2005–2006 outbreak of CHIKV infection were screened for anti-CHIKV antibodies. Serum specimens and corneoscleral rims were subjected to quantitative reverse-transcription real-time polymerase chain reaction (qRT-PCR) for detection of CHIKV. CHIKV isolation and immunolabeling were performed on eye tissue specimens. Viral transmission via the ocular route was assessed in an animal model of human CHIKV infection.

Results. Twelve apparently uninfected donors were viremic and/or positive for immunoglobulin M (IgM) and/or immunoglobulin G. Eye tissue specimens from 12 donors who were or were not viremic and were or were not seropositive were investigated. qRT-PCR detected CHIKV RNA in corneoscleral rims from 4 patients: 1 patient was viremic, 2 were viremic and IgM positive, and 1 was IgM positive. Infectious CHIKV was isolated from all qRT-PCR–positive samples, and antigens were detected in corneal and scleral specimens, the iris, the ciliary body, and oculomotor muscles.

Conclusions. One-third of eligible corneas (4 of 12) from donors apparently uninfected with CHIKV were infected with CHIKV during the study period. CHIKV infects the human cornea and can be transmitted via the ocular route. In the absence of systematic CHIKV screening in donors, cornea donation should be banned in areas where CHIKV circulates.

Couderc et al, J Inf Dis, 2012; Gajurel et al, Viruses, 2025; Labadie et al, J Cli Invest, 2010

Chikungunya in SOT

Most clinical features like general population

Arthralgia and arthritis seems to be less common in SOT

Atypical/severe features (pneumonitis, myocarditis, encephalitis) uncommon

Transient acute kidney injury can occur

Clinical course generally benign, except for persistent arthralgia

No association with rejection demonstrated

Gajurel et al, Viruses, 2025; Tavares et al, Transplantation 2019; Dave et al, Exp. Clin. Transplant. 2023; Pimenta et al, Transpl Inf Dis, 2021; Rosse et al, Transpl Inf Dis 2018

Clinical Case

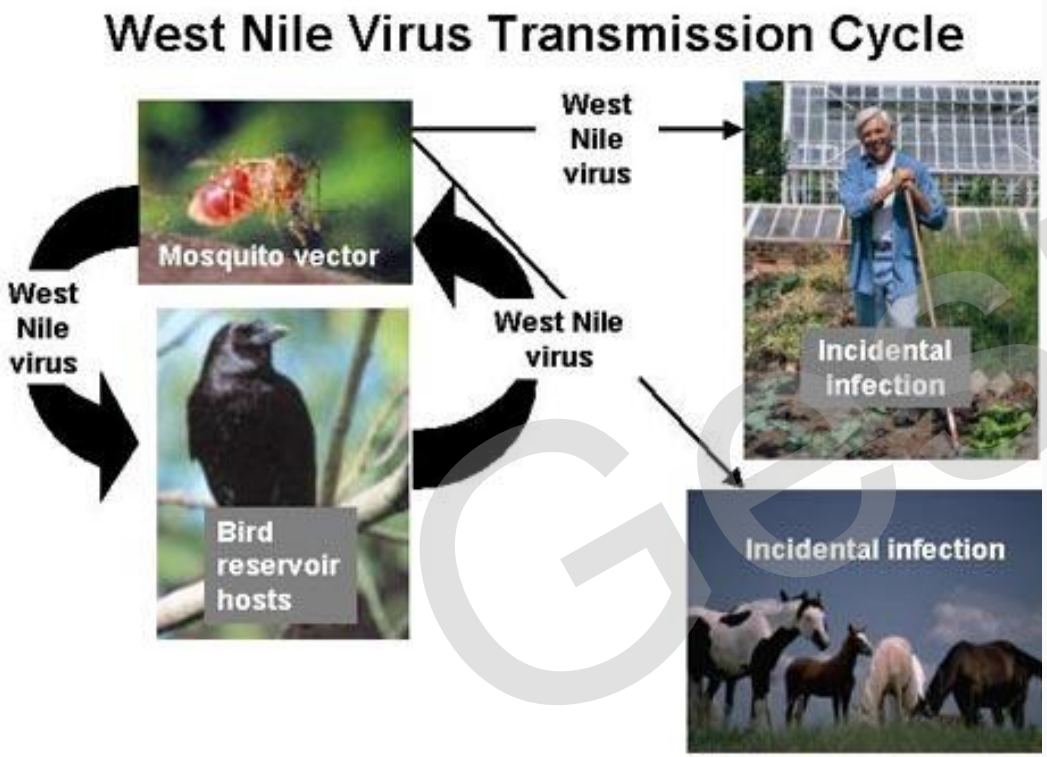
- 38-year-old woman with acute kidney failure, fever, headaches, and diarrhea 3 weeks after left kidney transplantation (Grenoble, France)
- 61-year-old man, right kidney recipient, admitted with isolated fever without neurologic symptoms, 20 days after transplantation (Montpellier, France)

- WNV genome in multiple specimens and WNV IgM in serum 14 days after symptom onset (serum before kidney transplantation PCR/serology negative)
- WNV-positive PCR in blood, urine, saliva, and serology (WNV IgM and IgG) 24 days after transplant

Organ donor : died mid-July 2025, cerebral hemorrhage/hypertensive crisis.
No clinical signs except for lesions on abdomen and lower limbs
Donor specimens retrospectively positive for WNV

Truffot et al, EID, 2026

West Nile virus



West Nile virus DDI

- First cases DDI-WNV reported in US, 2002 (4 SOT recipients from common donor)
  - 85% SOT recipients from WNV-infected donors acquire infection
  - 70% develop neuroinvasive disease
  - 26% mortality rate
- Recent cases in France: both kidney recipients had mild infection, favorable outcomes, no sequelae

Truffot et al, EID, 2026; Soto et al, EID, 2022; Shingde et al, Transpl Inf Dis, 2018

Donor-Derived West Nile Virus Infection in Kidney Transplant Recipients, France, 2025

Aurélie Truffot, Anne-Sophie Montcuquet, Gilda Grard, Laura Pezzi, Raphaelle Klitting, Gabriel Clavel, Sylvain Trincal, Paolo Malvezzi, Lionel Rostaing, Lara Meyer, Stéphanie Dieterle, Sophie Lucas Samuel, Vincent Foulongne, Laura Le Fleur, Patricia Pavese, Gaël Pradel, Florian Franke, Syria Laperche, Julien Lupo, Anne Signori-Schmuck, Raphaële Germi, Patrice Morand

We report 2 cases of donor-derived West Nile virus infection in kidney transplant recipients in France. Both recipients had mild disease develop and recovered without sequelae. A more proactive screening strategy in France, particularly during periods of highest risk for West Nile virus circulation, would help reduce risk for donor-derived infections.

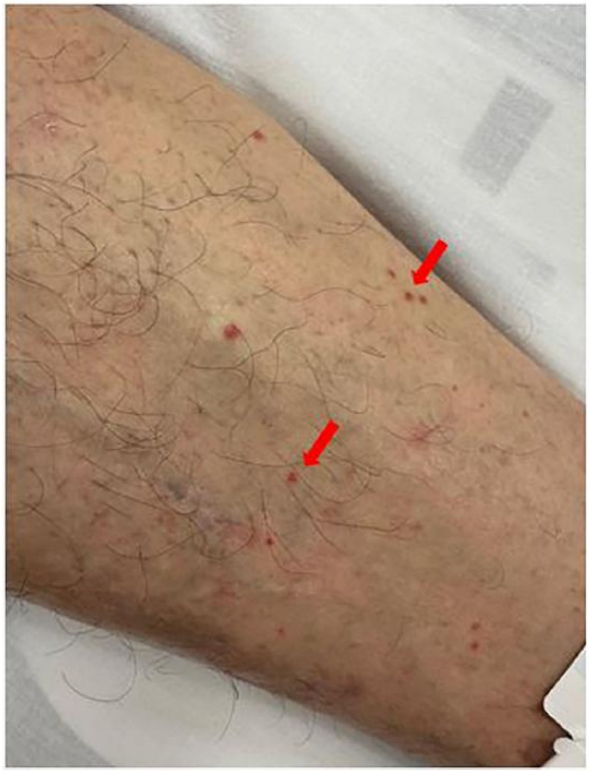


Figure 1. Diffuse skin lesions on donor's leg in case of donor-derived West Nile virus infection in kidney transplant recipients, France, 2025. Lesions were suggestive of eruptive pseudo-angiomatosis associated with West Nile virus infection.

Emerging arboviral infections: recommendations

- Screen donors with risk factors (exposure in endemic areas in last 28 days) and and/or symptoms:
    - PCR DENV/CHIKV/WNV/ZIKV
    - NS1 Ag test for dengue
    - For ZIKV, possibility sexual transmission (previous 6 months)

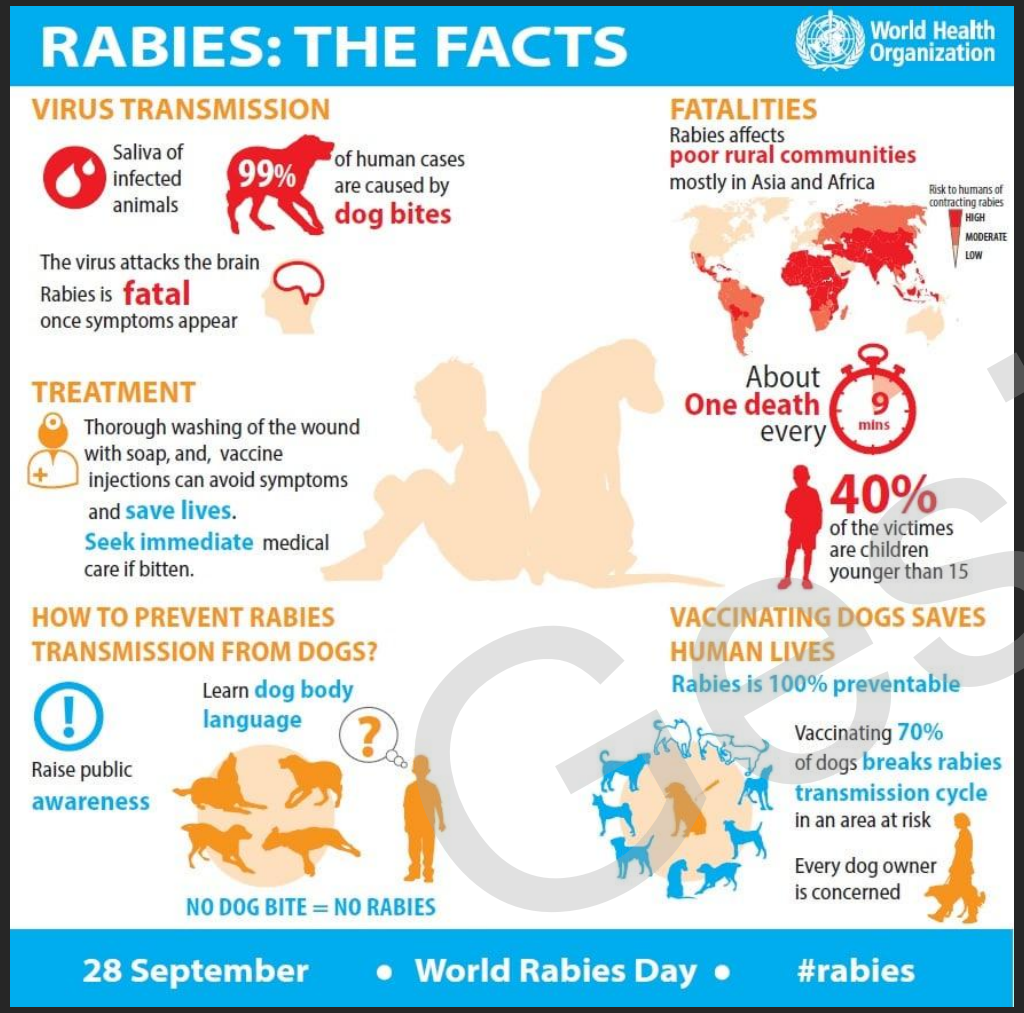
Documento consenso SEIMC-GESITRA-ONT 2019; Documento consenso SEIMC, GEPI, GESITRA-IC, GeSIDA, GEIRAS, 2025

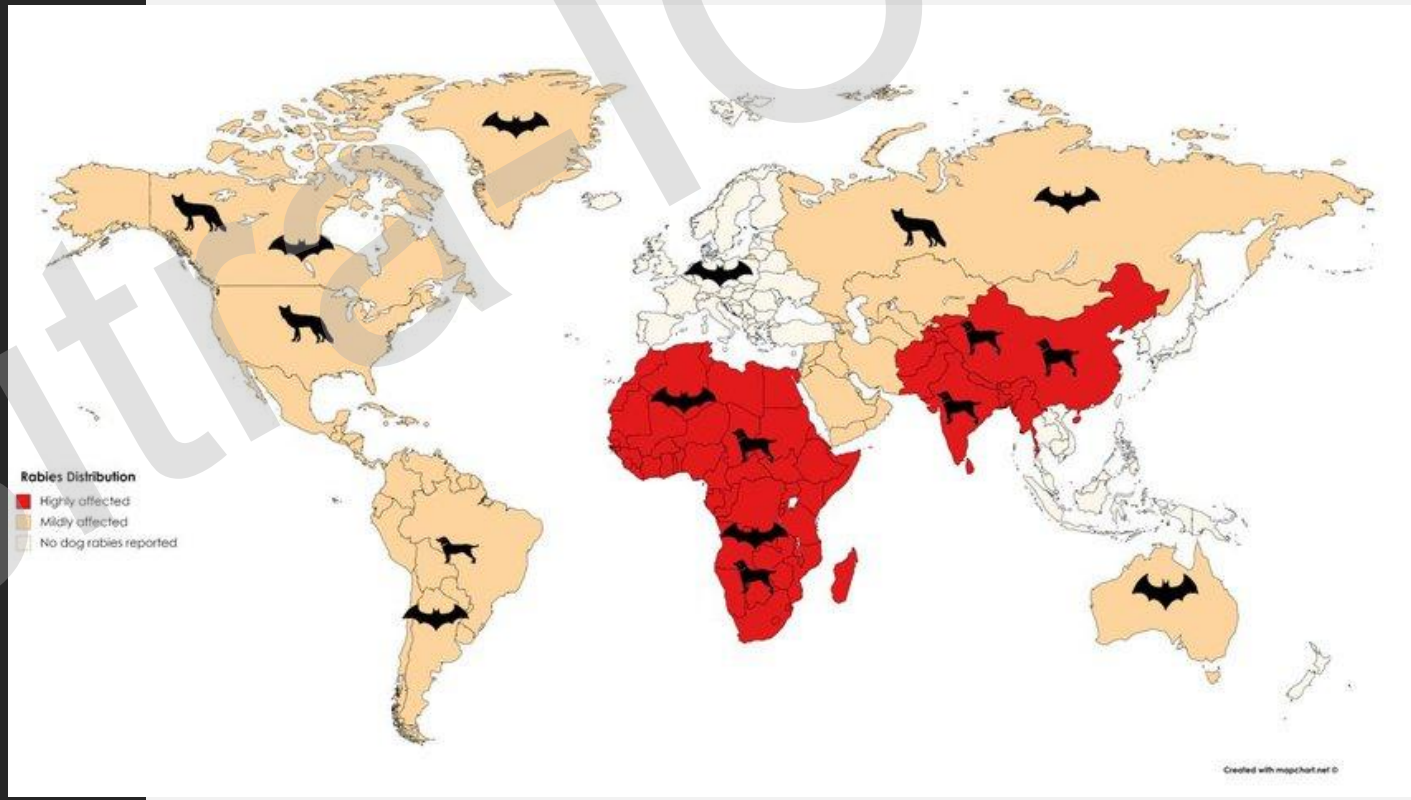
Clinical case

- 5 weeks post SOT:
- Left kidney transplant recipient (Idaho donor) develops tremors, lower extremity weakness, confusion, and urinary incontinence.
- Seven days after symptom onset, hospitalized with fever, hydrophobia, dysphagia, and autonomic instability
- Hospital day 2: invasive mechanical ventilation.
- Hospital day 4, CDC contacted
- Donor Risk Assessment Interview questionnaire reported donor received a skunk scratch.

Earnest et al, MMWR, 2025

Rabies


RABIES: THE FACTS
World Health Organization
VIRUS TRANSMISSION
Saliva of infected animals
99% of human cases are caused by dog bites
The virus attacks the brain
Rabies is fatal once symptoms appear
TREATMENT
Thorough washing of the wound with soap, and, vaccine injections can avoid symptoms and save lives.
Seek immediate medical care if bitten.
HOW TO PREVENT RABIES TRANSMISSION FROM DOGS?
Raise public awareness
Learn dog body language
NO DOG BITE = NO RABIES
FATALITIES
Rabies affects poor rural communities mostly in Asia and Africa
Risk to humans of contracting rabies
HIGH
MODERATE
LOW
About One death every 9 mins
40% of the victimes are children younger than 15
VACCINATING DOGS SAVES HUMAN LIVES
Rabies is 100% preventable
Vaccinating 70% of dogs breaks rabies transmission cycle in an area at risk
Every dog owner is concerned
28 September • World Rabies Day • #rabies


Rabies Distribution
Highly affected
Mildly affected
No dog rabies reported

Rabies DDI

24 cases identified (no cases in HSCT)

- 9 cases in **corneal graft recipients**
  - 8 fatal
  - 1 survived: PEP on day +1 post-Tp

- 15 cases in **SOT recipients**
  - US and Germany (2004, 2005):
    - encephalitis 30-60 days post-Tp, all fatal except liver Tp recipient (**previous vaccination**) (dog, bat)
  - US (2013):
    - **encephalitis 18 months post-renal Tp**; 3 recipients survived (no previous vaccination, PEP) (raccoon)
  - China (2015):
    - encephalitis 42-48 days post-Tp, 2 renal recipients; 2 recipients corneal grafts survive (PEP) (dog)
  - Kuwait (2017):
    - encephalitis 3.5 months post-renal Tp; explanted corneal grafts (dog)
  - China (2017):
    - encephalitis 40-43 days post-renal Tp
  - US (2025):
    - fatal encephalitis 51 days post-renal Tp (corneal grafts removed and PEP in 3 recipients)(skunk)

Vora et al 2013; Vora et al 2015; Maier et al, 2010; Srinivasan et al 2005; Zhou et al 2016; Saeed et al 2017; Chen et al 2017; Earnst et al, MMWR, 2025

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    - encephalitis 40-43 days post-renal Tp (dog/exposure unknown)
  - US (2025):
    - fatal encephalitis 51 days post-renal Tp (corneal grafts removed and PEP in 3 recipients)(skunk)

Vora et al 2013; Vora et al 2015; Maier et al, 2010; Srinivasan et al 2005; Zhou et al 2016; Saeed et al 2017; Chen et al 2017; Earnst et al, MMWR, 2025

Rabies DDI

U.S. Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Weekly / Vol. 74 / No. 39 December 4, 2025

Human-to-Human Rabies Transmission via Solid Organ Transplantation from a Donor with Undiagnosed Rabies — United States, October 2024–February 2025

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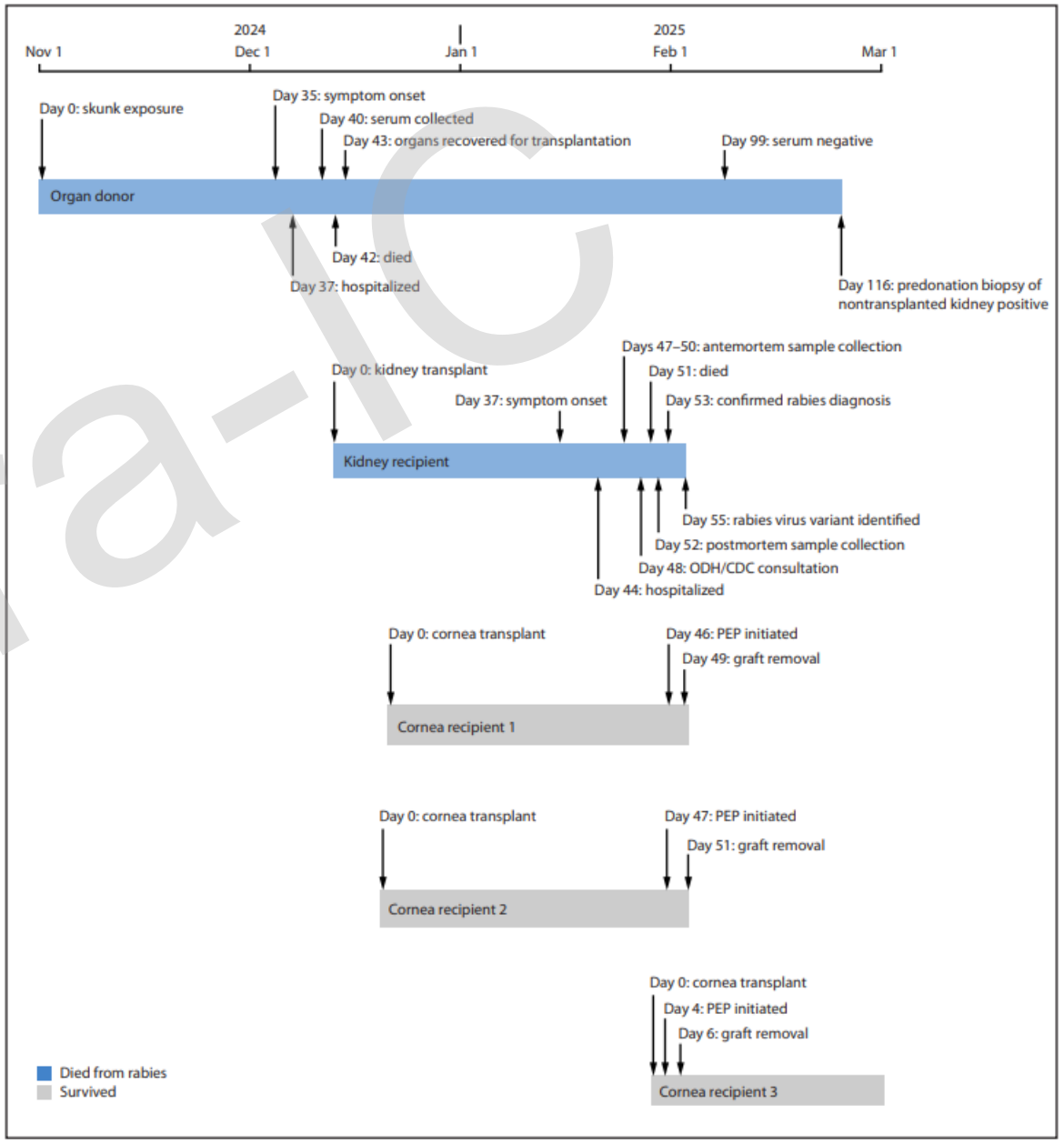
- Fatal encephalitis 51 days post-renal Tp
- Corneal grafts removed and PEP in 3 recipients
- Donor: scratched by a skunk
  - 5 weeks later: confusion, difficulty swallowing and walking, hallucinations, stiff neck.
  - 2 days after symptom onset: unresponsive at home, presumed cardiac arrest
- Skunks are not rabies virus reservoir in Idaho
- Investigation suggested three-step transmission chain: rabid silver-haired bat→ skunk → donor→ kidney recipient

FIGURE. Clinical course, diagnostic testing, and investigation timeline for a transplant-associated rabies case* — United States, November 2024–February 2025



Abbreviations: ODH = Ohio Department of Health; PEP = postexposure prophylaxis.
* Antemortem samples from the kidney recipient included cerebrospinal fluid (collected on day 47), skin and serum samples (day 49), and saliva (days 49–50).

Rabies: recommendations

- Identify risk factors:
  - Donor travel, exposure/accidents, wounds, previous vaccination
- Fever and unexplained CNS event should be investigated
- Reject donor if encephalitis of unknown etiology
- Transmission events: early immunisation of other recipients

Enferm Infecc Microbiol Clin. 2020;38(8):379–389

Enfermedades Infecciosas y Microbiología Clínica

www.elsevier.es/eimc

Consensus Document

Executive summary of the Consensus Document of the Transplant Infection Study Group (GESITRA) of the Spanish Society of Infectious Diseases and Clinical Microbiology (SEIMC) and the National Transplant Organization (ONT) on the Selection Criteria of Donors of Solid Organs in relation to Infectious Diseases☆

Oscar Len[a,*], Ibai Los-Arcos[a], José María Aguado[b], Marino Blanes[c], Marta Bodro[d], Jordi Carratalà[e], Elisa Cordero[f], María Carmen Fariñas[g], Mario Fernández-Ruiz[b], Jesús Fortún[h], Joan Gavaldà[a], Francisco López-Medrano[b], Rogelio López-Vélez[h], Carlos Lumbreras[b], Beatriz Mahillo[i], María Ángeles Marcos[d], Pilar Martin-Dávila[h], José Miguel Montejo[j], Asunción Moreno[d], Patricia Muñoz[k], Francesca Norman[h], José Luis Pérez-Sáenz[l], Tomás Pumarola[a], Núria Sabé[e], Rafael San-Juan[b], Elisa Vidal[m], Beatriz Domínguez-Gil[l], on behalf of the Transplant Infection Study Group (GESITRA) of the Spanish Society of Infectious Diseases and Clinical Microbiology (SEIMC), and the National Transplant Organization (ONT)

7.13. What course of action should be undertaken in cases of suspected rabies virus infection?

- Transmission risk: RL1.
- Recommendations
  a. Draw a history, as detailed as possible, of donor travels, exposures or accidents that occurred during these trips, such as bites, wounds, and a history of previous travel vaccinations. AII.
  b. Donors with fever and an unexplained CNS event should be evaluated to rule out meningoencephalitis. AIII.
  c. Reject the donor with unknown encephalitis data. II.
  d. In case of transplant transmission, identify and perform early immunisation of the other recipients. AIII.

Documento consenso SEIMC-GESITRA-ONT 2019

Expect the unexpected…

RAPID COMMUNICATIONS

Rift Valley fever in kidney transplant recipient returning from Mali with viral RNA detected in semen up to four months from symptom onset, France, autumn 2015

F Haneche [1], I Leparc-Goffart [2], F Simon [3], M Hentzien [1], V Martinez-Pourcher [1], E Caumes [1,4], M Maquart [2,4]

1. Service de maladies infectieuses et tropicales, CHU Pitié-Salpêtrière, Paris, France
2. Centre National de Référence des Arbovirus, Institut de Recherche Biomédicale des Armées Marseille, France
3. Pathologie infectieuse et tropicale, Hôpital d'Instruction des Armées Laveran, Marseille, France
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Citation style for this article:
Haneche F, Leparc-Goffart I, Simon F, Hentzien M, Martinez-Pourcher V, Caumes E, Maquart M. Rift Valley fever in kidney transplant recipient returning from Mali with viral RNA detected in semen up to four months from symptom onset, France, autumn 2015. Euro Surveill. 2016;21(18):pii=30222. DOI: http://dx.doi.org/10.2807/1560-7917.ES.2016.21.18.30222

Article submitted on 16 April 2016 / accepted on 04 May 2016 / published on 05 May 2016

A 29-year-old kidney transplant recipient returning from Mali was diagnosed with Rift Valley fever (RVF) in France in autumn 2015. The patient was immunosuppressed due to his renal transplant. IgM and IgG specific to RVF virus (RVFV) were detected in cerebrospinal fluid and blood up to two months after symptom onset, whereas in urine, RVFV genomic RNA was detected by RT-PCR up to three months, and in semen up to four months post symptom onset.

Cache virus

- *Orthobunyavirus* transmitted by mosquitos
- Identified in mosquitos in Cache Valle, Utah, US
- N. and C. America, parts S. America
- Clinical infections in humans are rare (<10 casos)

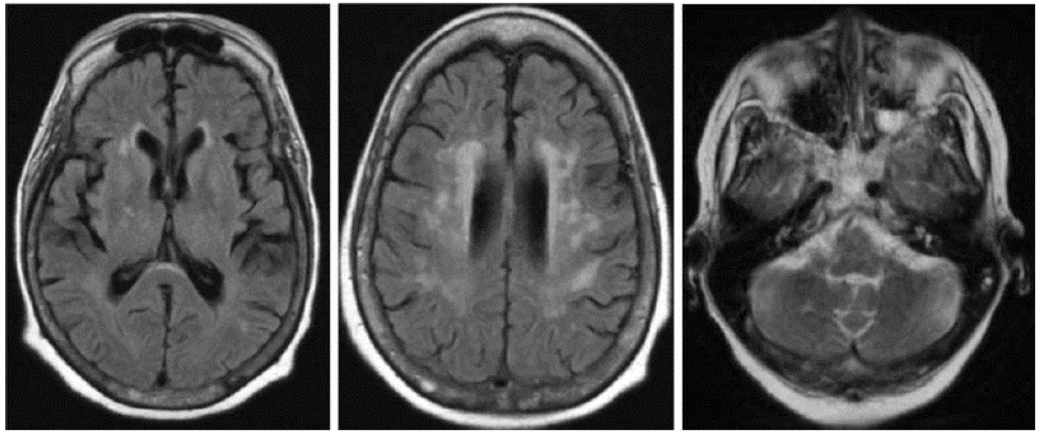
- Encephalitis 6 weeks post- renal Tp

- Highlights **atypical course** of arboviral infections in immunosuppressed patients, diagnostic challenge, possibility of **prologed viremia**

Clinical Infectious Diseases
MAJOR ARTICLE

Transfusion-Transmitted Cache Valley Virus Infection in a Kidney Transplant Recipient With Meningoencephalitis

Omar Al-Heeti,[1,a] En-Ling Wu,[1,a] Michael G. Ison,[1,2] Rasleen K. Saluja,[3,4] Glenn Ramsey,[3] Eduard Matkovic,[3] Kevin Ha,[3,5] Scott Hall,[5] Bridget Banach,[6] Michael R. Wilson,[7] Steve Miller,[8,9] Charles Y. Chiu,[8,9] Muniba McCabe,[10] Chowdhury Bari,[10] Rebecca A. Zimler,[10,11] Hani Babiker,[12] Debbie Freeman,[13] Jonathan Popovitch,[13] Pallavi Annambhotla,[14] Jennifer A. Lehman,[15] Kelly Fitzpatrick,[15] Jason O. Velez,[15] Emily H. Davis,[15] Holly R. Hughes,[15] Amanda Panella,[15] Aaron Brault,[15] J. Erin Staples,[15] Carolyn V. Gould,[15] and Sajal Tanna[1,2]



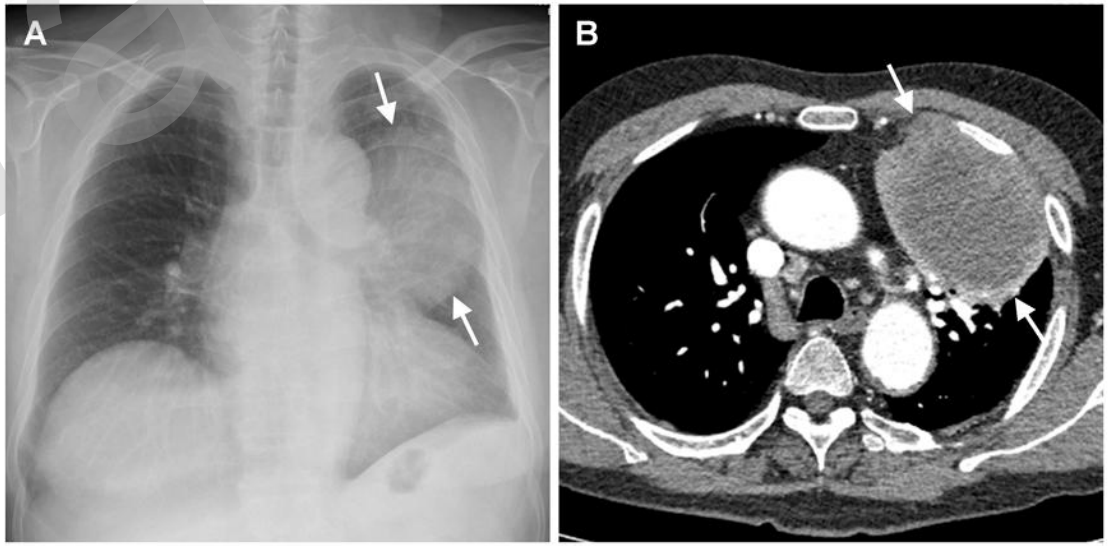
Geographically-restricted bacterial infections

Clinical Case

- 63-year-old man presenting with prolonged fever, non-productive cough, and weight loss for 3 months.
- Kidney transplantation 4 years previously
- CXR mass-like lesion in the left upper lobe
- Histopathological examination of transthoracic needle lung biopsy yielded adenocarcinoma, while tissue culture grew…….

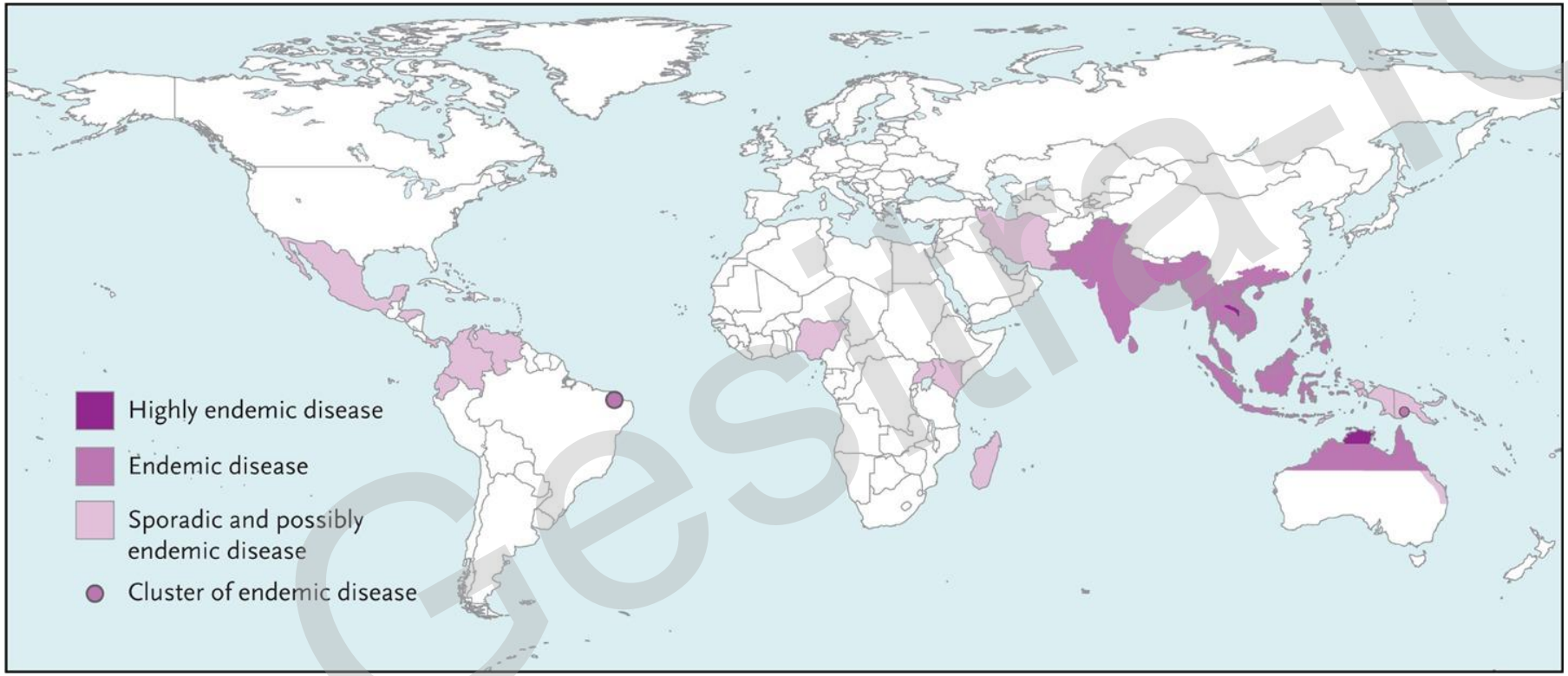
  Burkholderia pseudomallei

- Diagnosis: stage IIIA non-small cell lung cancer with localized pulmonary melioidosis



Saigal et al, Liver Transpl, 2013

Melioidosis



Wiersinga et al, 2012

Melioidosis in SOT

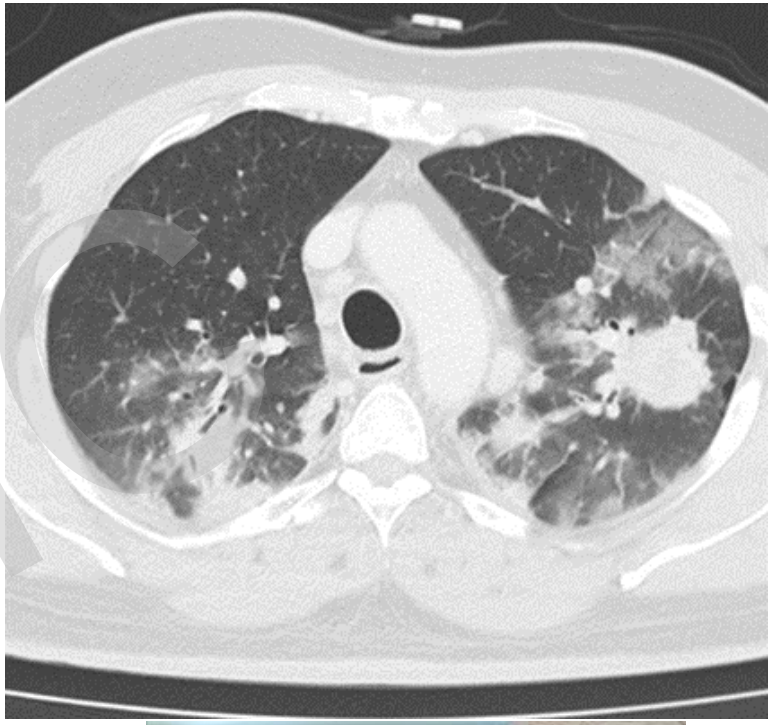
No DDI identified

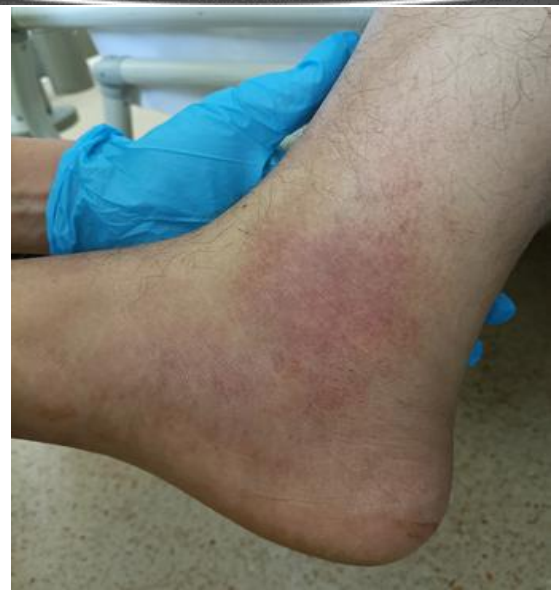
n=5 cases in SOT (none in HSCT):

- Renal Tp
- 4 in India, 1 in Australia
- 2 with DM
- Clinical manifestations: pulmonary (2), septic arthritis, CNS abscess; GU involvement
- No fatal cases

Transient graft dysfunction in some

Possible protective effect of TMP/SMX prophylaxis





John et al, Transplantation, 2003; Varughese et al, Transpl Infect Dis. 2011; Jabbar et al, Transpl Infect Dis. 2013; Sathiavageesan et al, Indian J Nephrol. 2016; Muthina et al, Transpl Infect Dis, 2021; Bansal et al, Transplantation, 2023

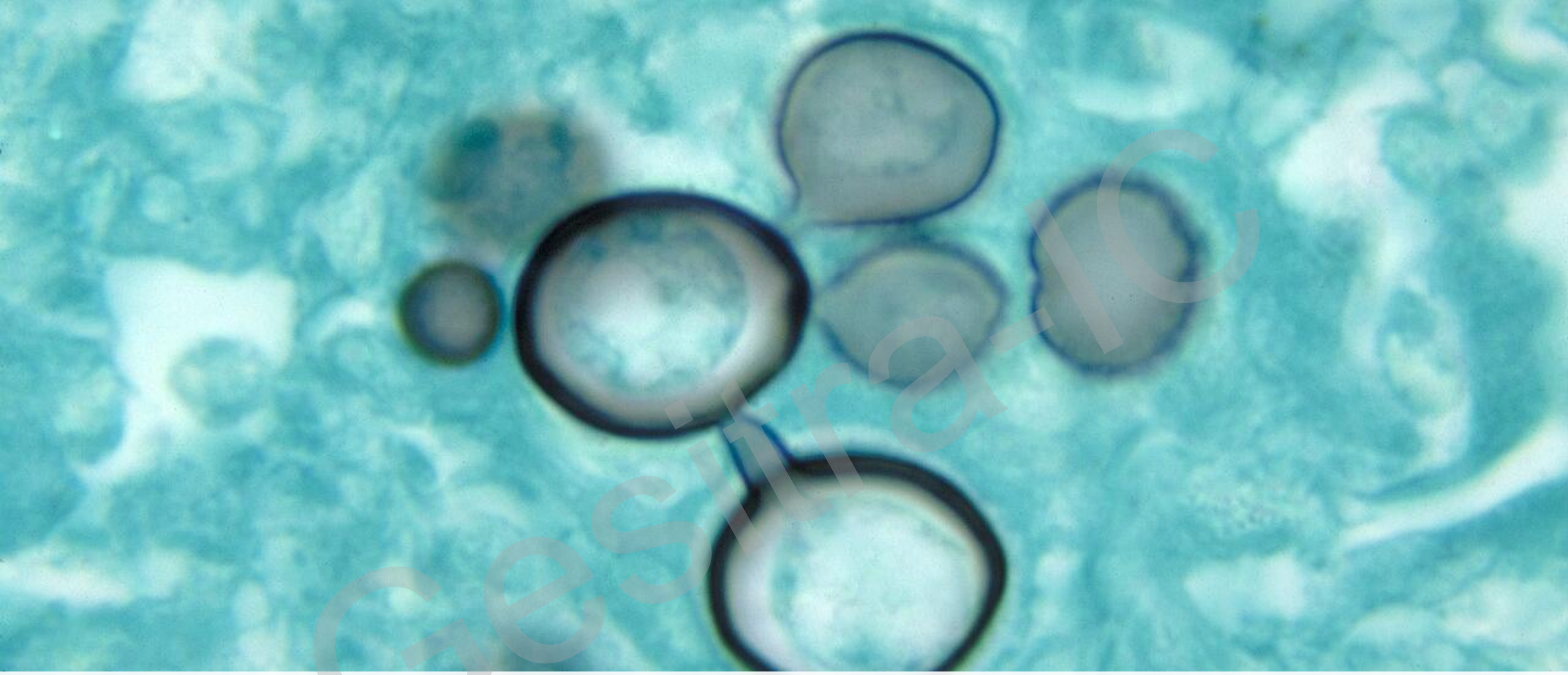
Melioidosis: recommendations

- Prevention:
  - avoid exposure soil/water (rainy season/flooding endemic areas)
  - no routine donor/recipient screening recommendations
  - reactivation of latent infections

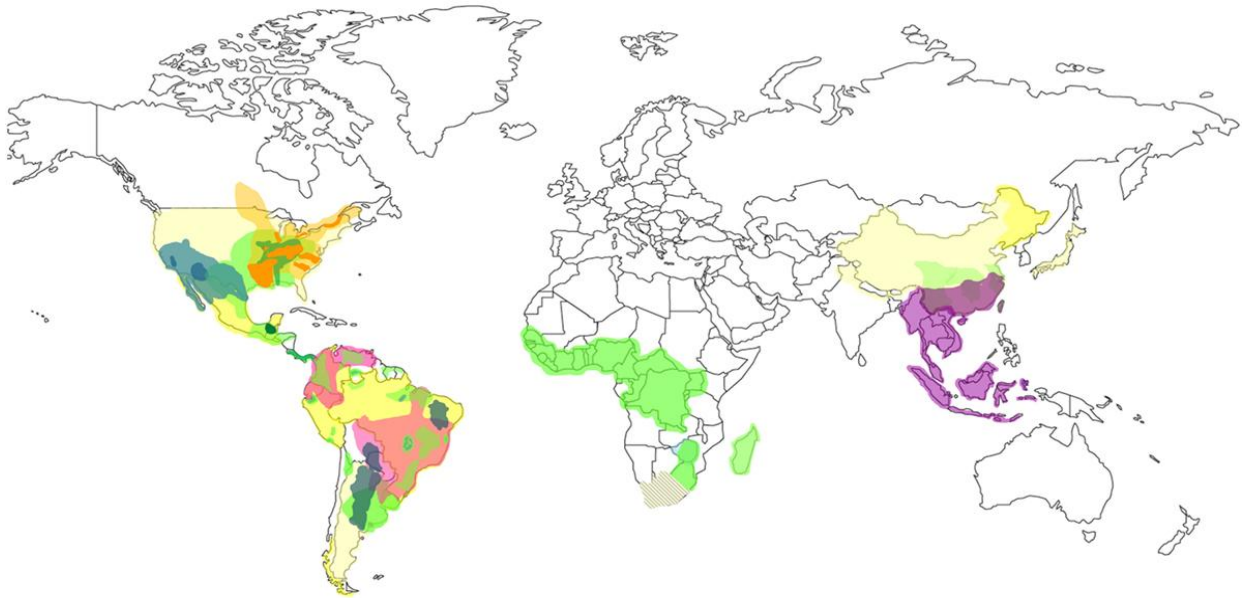
Figure 1. Exposure countries among 112 travel-related melioidosis cases with identified single-exposure country (2016–22).

2016-2022
n=137 reports travel-associated melioidosis (no SOT)

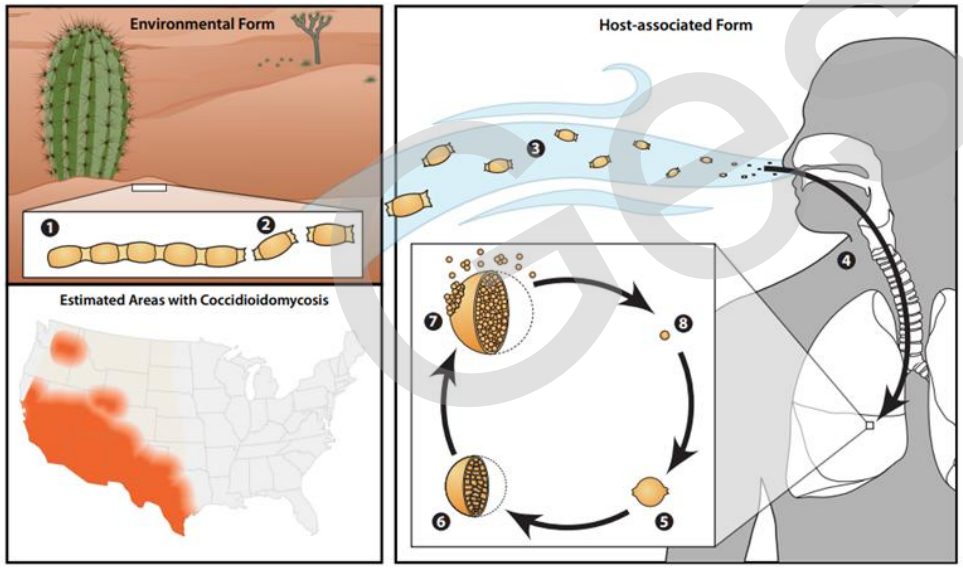
Norman et al, JTM, 2023



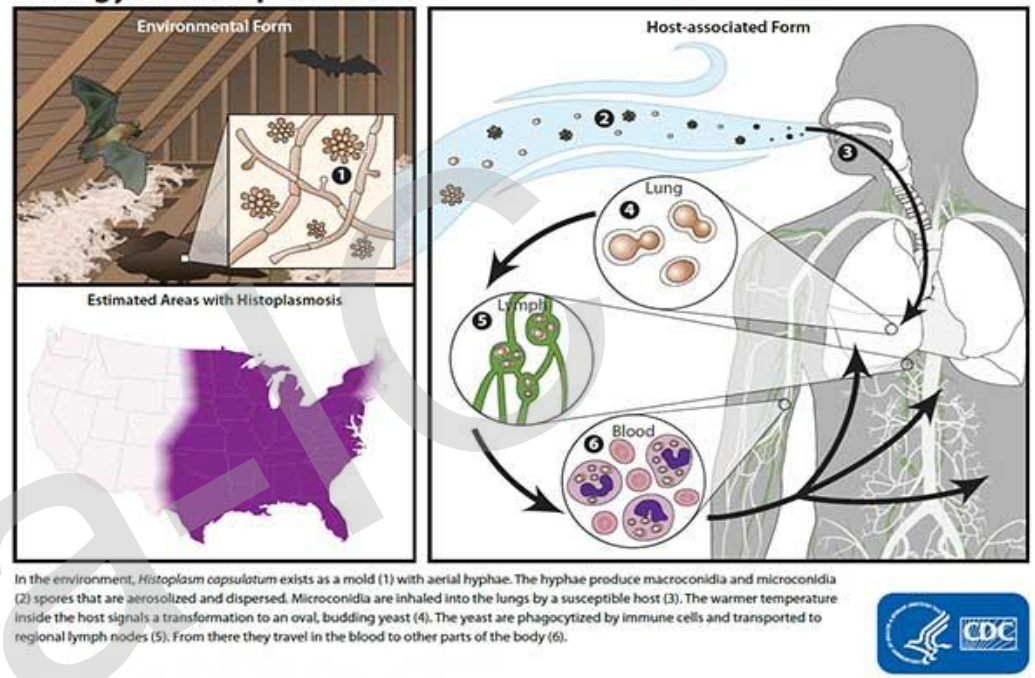
Endemic mycoses



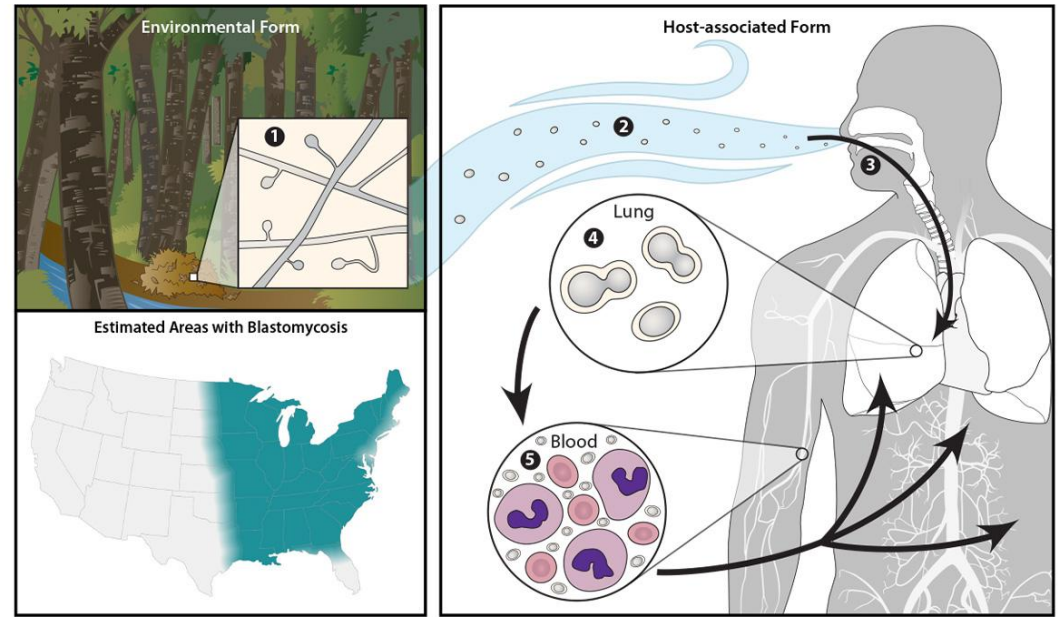
Coccidioidomycosis
Regions with high burden of coccidioidomycosis
Paracoccidioidomycosis
Blastomycosis
Regions with high burden of blastomycosis
Histoplasmosis
Regions with high burden of histoplasmosis
Emmonsiosis
Sporotrichosis
Regions with high burden of sporotrichosis
Penicilliosis *(Taloromyces marneffei)*



Biology of Histoplasmosis



In the environment, *Histoplasm capsulatum* exists as a mold (1) with aerial hyphae. The hyphae produce macroconidia and microconidia (2) spores that are aerosolized and dispersed. Microconidia are inhaled into the lungs by a susceptible host (3). The warmer temperature inside the host signals a transformation to an oval, budding yeast (4). The yeast are phagocytized by immune cells and transported to regional lymph nodes (5). From there they travel in the blood to other parts of the body (6).

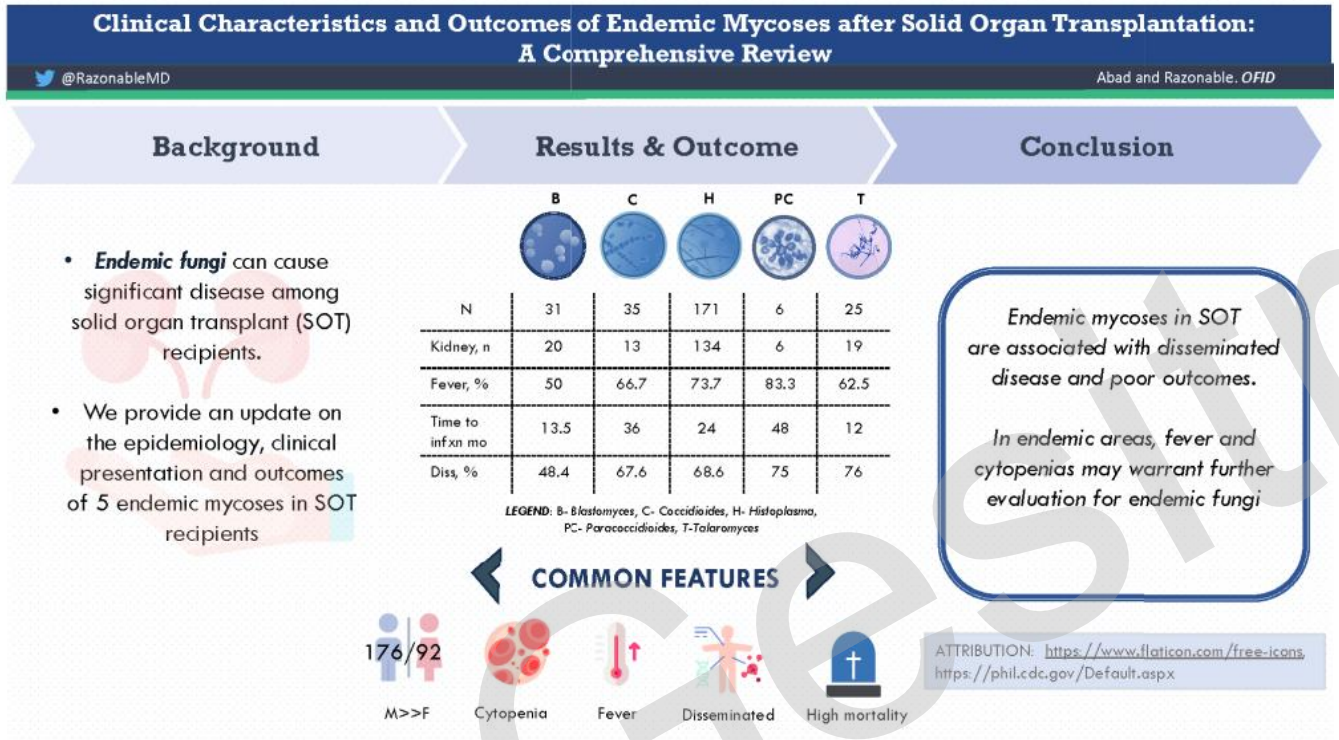


Endemic mycoses and SOT

Open Forum Infectious Diseases
REVIEW ARTICLE

Clinical Characteristics and Outcomes of Endemic Mycoses After Solid Organ Transplantation: A Comprehensive Review

Cybele Lara R. Abad[1,*] and Raymund R. Razonable[2]



→12 % graft loss
→ 26 % overall mortality (50% attributed to fungal infection)

- Majority renal Tp
  - >50% fever, cytopenias
  - >48% dissemination
- Median t to infection (m):
  12m talaromycosis-48m PC
- HLH in histoplasmosis
- Co-infections (talaromycosis and histoplasmosis)
  - histoplasmosis *de novo*
  - coccidioidomycosis/talaromycosis reactivactions
  - coccidioidomycosis DDI
- Majority: risk factors could be identified

Abad et al, OFID, 2024

Endemic mycoses: DDIs

Received: 7 August 2023 | Revised: 23 September 2023 | Accepted: 13 November 2023
DOI: 10.1111/ctr.15199
BRIEF COMMUNICATION
Clinical TRANSPLANTATION The Journal of Clinical and Translational Research WILEY

Donor-derived endemic mycoses after solid organ transplantation: A review of reported cases

Cybele Lara R. Abad[1] | Raymund R. Razonable[2]

- 16 coccidioidomycosis
- 7 histoplasmosis
- 1 talaromycosis
- (No cases blastomycosis/PC)

→DDI in non-endemic areas: no screening for risk factors

→Typical presentation: fever in 1st month post-Tp

→Dissemination and high mortality

→Possibility of false negative serology in recipient

→Anti-fungal prophylaxis in recipient may prevent transmission

Abad et al, Clinical Transplantation, 2024

Endemic mycoses: recommendations

- Reactivation more frequent than DDI
- Consider screening donor/recipient (serology) if risk factors for *H. capsulatum* and *C. immitis* infection
- (donation not necessarily contraindicated but may need specific prophylaxis in recipient)

8. ¿QUÉ ACTITUD TOMAR ANTE UNA SOSPECHA DE INFECCIÓN POR *COCCIDIOIDES* SPP?

A. Riesgo de transmisión: RL2.

B. Recomendaciones

- Se recomienda el cribado mediante técnicas serológicas en donantes con estancia o viajes en zonas endémicas. AII.
- En los centros de referencia españoles la técnica serológica disponible es la inmunodifusión (IgG e IgM). AII.
- La utilización de técnicas moleculares ha sido útil en trasplantados con sospecha clínica de reactivación y serología negativa pero no existe experiencia en el cribado de donantes. CIII.
- En caso de donantes que han vivido en zonas endémicas y máxime si presentan antecedentes de infección pasada o cambios radiológicos sugestivos se recomienda iniciar profilaxis en el receptor con fluconazol post-trasplante en espera de los resultados serológicos. BII.
- Si éstos son positivos es obligatorio descartar enfermedad activa. AII. En ausencia de éstos, debería mantenerse profilaxis con fluconazol, itraconazol o posaconazol durante al menos 6 meses y con monitorización serológica trimestral durante el primer año y anual de forma posterior. BII.

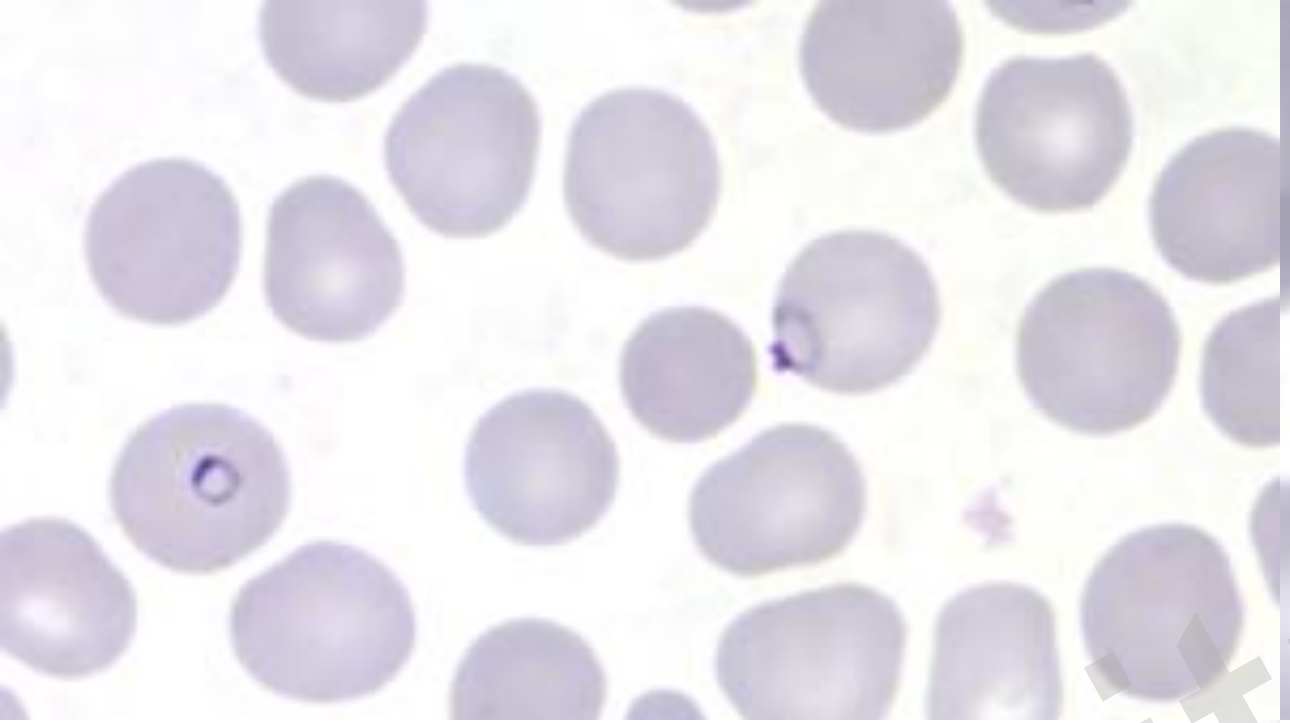
9. ¿QUÉ ACTITUD DEBE TENERSE ANTE UN CASO DE SOSPECHA DE INFECCIÓN POR *HISTOPLASMA CAPSULATUM?*

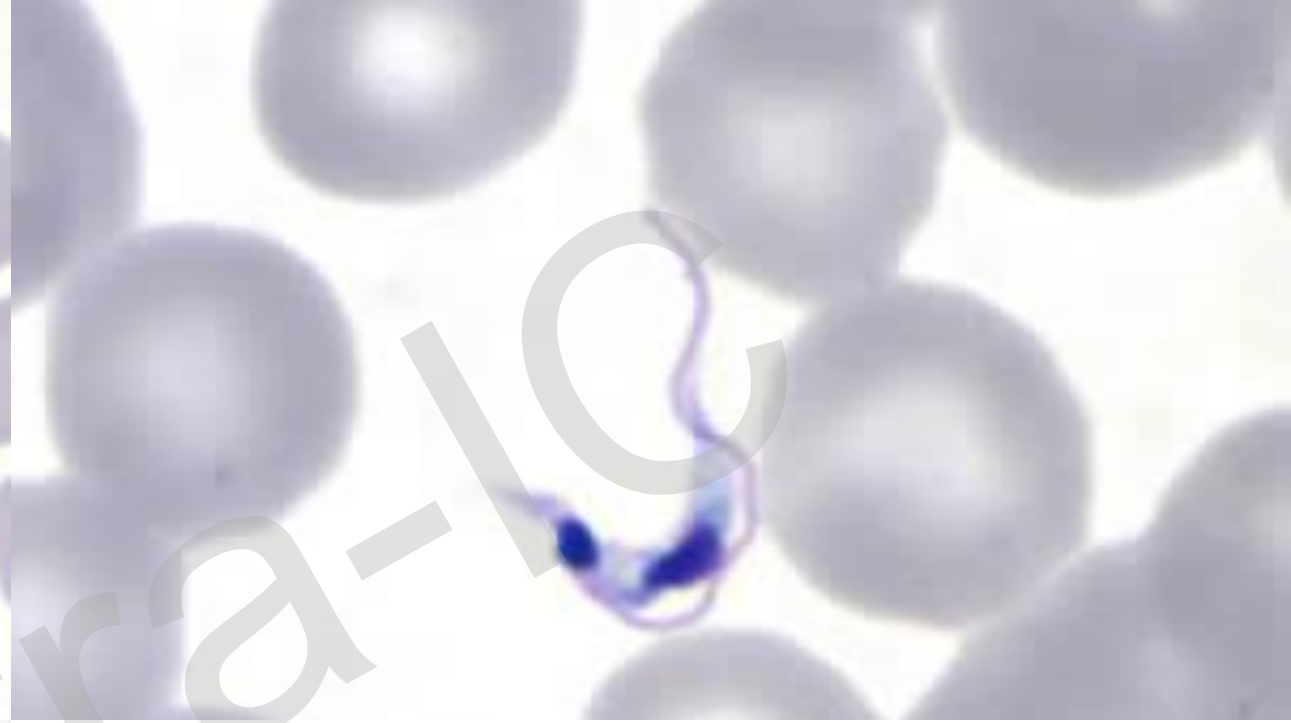
A. Riesgo de transmisión: RL2.

B. Recomendaciones

- En zonas no endémicas, es importante realizar una correcta historia clínica a donantes que hayan podido residir o viajar en zonas endémicas y realizar un cribado mediante serología, en especial a aquellos con antecedentes clínicos y/o radiología de tórax sugestiva. AII.
- La inmunodifusión es la técnica disponible en los centros de referencia españoles. AII. El resultado no debe condicionar la indicación del trasplante. AII.
- Se recomienda administrar itraconazol a receptores de donantes seropositivos durante al menos 3-6 meses durante el periodo de máxima inmunosupresión. BIII.
- Aunque posaconazol se ha demostrado eficaz en el tratamiento de histoplasmosis no existe experiencia sobre su uso en profilaxis. CIII.

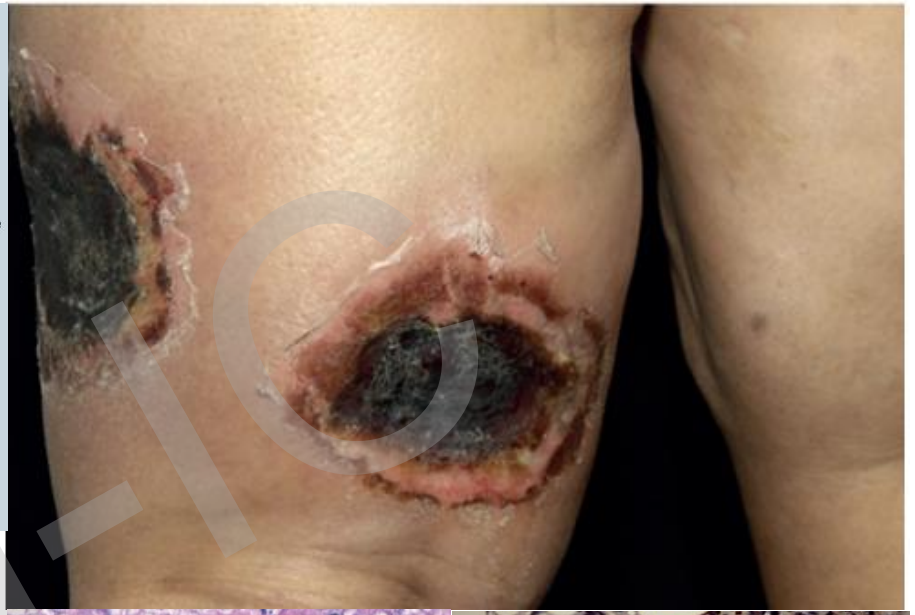
Documento consenso SEIMC-GESITRA-ONT 2019; Documento consenso SEIMC, GEPI, GESITRA-IC, GeSIDA, GEIRAS, 2025

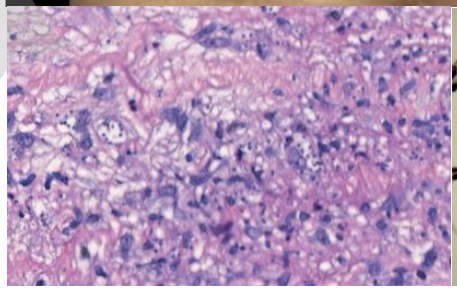


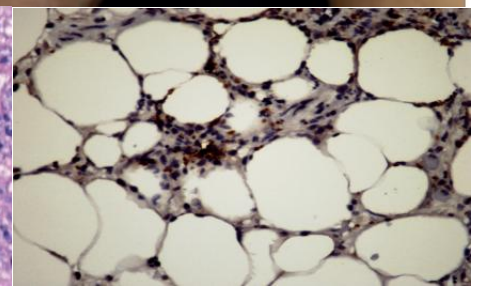


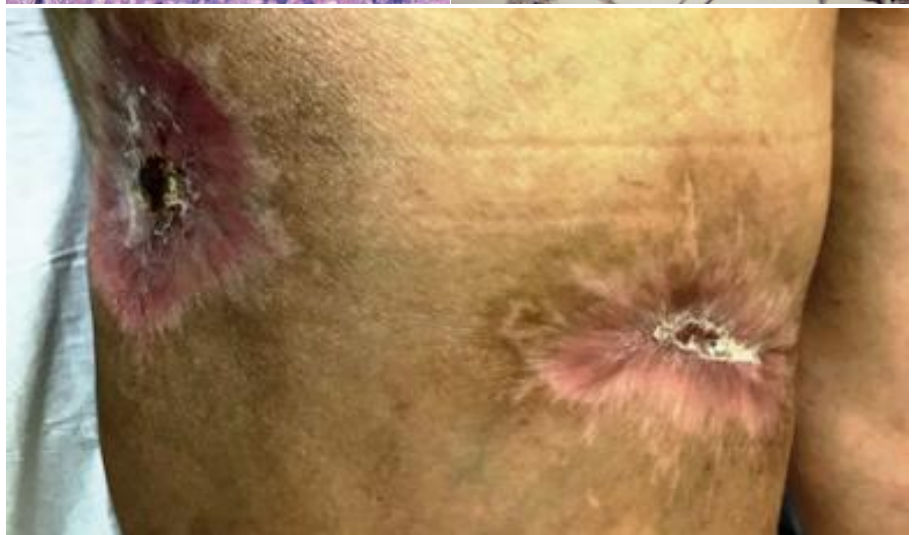
Parasitic Infections in SOT

Clinical case









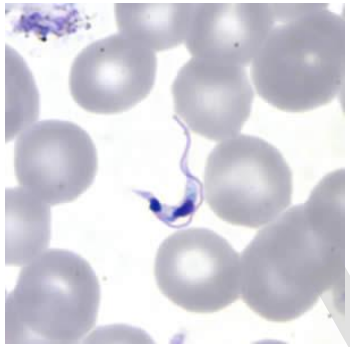
- 50 year-old female
- Cutaneous lesions (2 weeks)
- Renal transplant recipient 2 months earlier (nephrosclerosis –HT)
- Chronic Chagas disease (not treated)

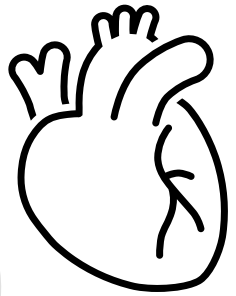
- Cutaneous biopsy: panniculitis + focal vasculitis + intracellular amastigotes (*T. cruzi*); IHC: amastigotes (brown)
- PCR blood positive for *T. cruzi*

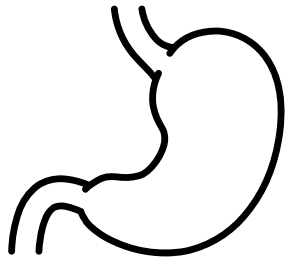
- Benznidazole x 30 days → resolved
- (immunosuppressive regime not modified due to risk of rejection)

Oliveira et al, Rev Soc Bras Med Trop, 2021

Chagas disease





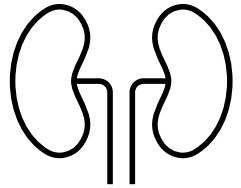


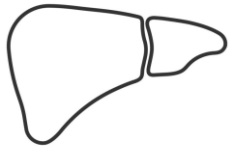
Chagas Disease DDIs

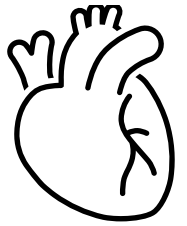
- *T. cruzi* transmission via SOT (renal, liver, pulmonary, cardiac, multi-organ)
  - 1981: first case following renal transplant

- Transmission donor→ recipient (estimates):
  - 20% in renal Tp
  - up to 30% in liver Tp
  - up to 75% in cardiac Tp (rare cases)

- In seropositive recipient: reactivation possible







Martin-Davila et al, CMR, 2008; Martinez-Perez A, et al, Expert Rev Anti Infect Ther. 2014; Clark et al, CMR, 2024

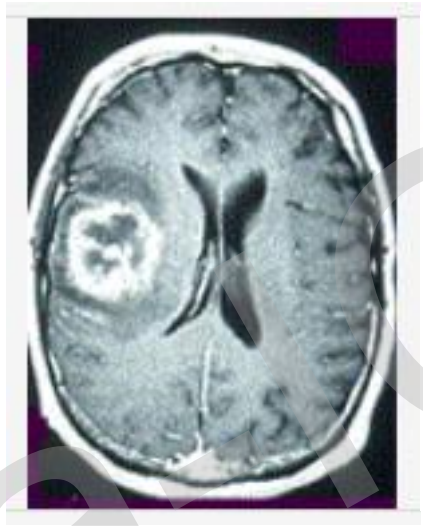
Chagas disease reactivation

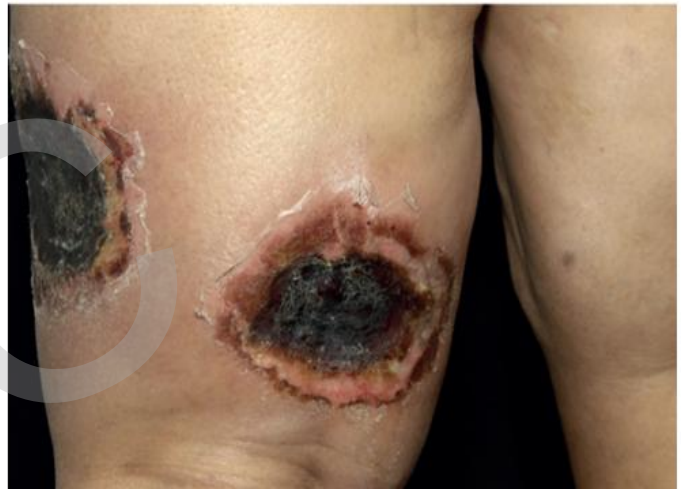
Due to post-Tp immunosuppression

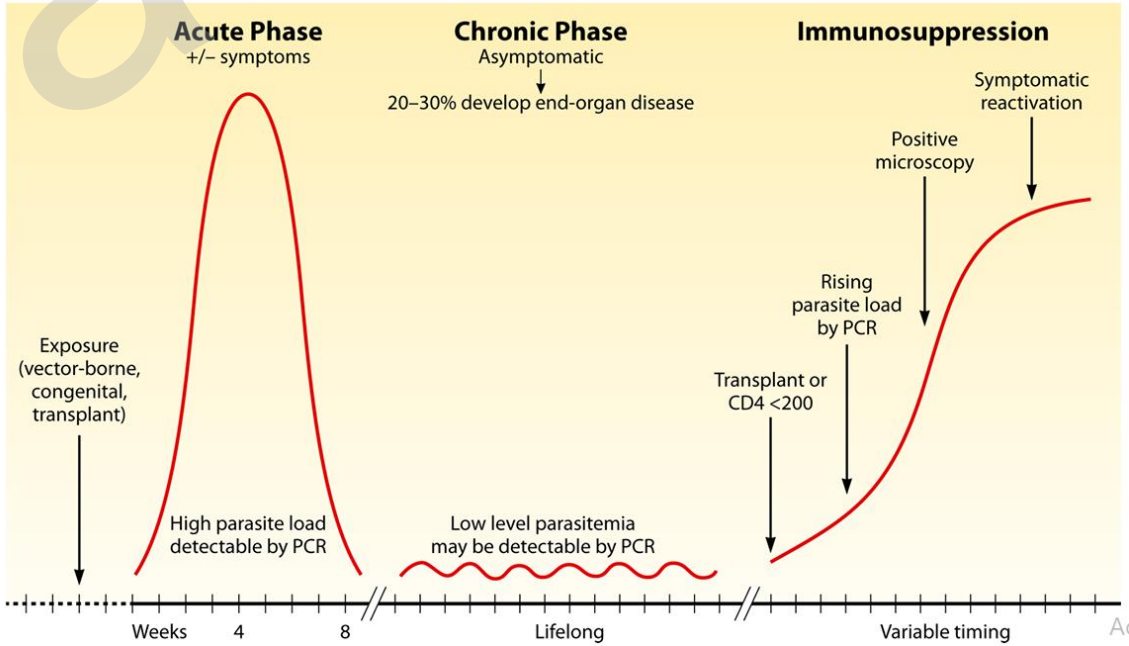
- Greater risk 1st 6 months

Approx risk 36% (greater in cardiac Tp, 8-90%)

- myocarditis (graft dysfunction, heart failure)
- fever
- panniculitis, cutaneous nodules
- CNS: meningoencephalitis, SOLs (“chagomas”)







Ferreira, Transpl Inf Dis, 2025; Fiorelli, Transpl Proc 2011, Gray, Transpl Inf Dis, 2018; Antequera et al, CMI, 2024; Oliveira et al, Rev Soc Bras Med Trop, 2021; Biro et al, JAAD, 2023; Marchiori et al, Clin Heart Transpl, 2007; Clark, CMR, 2024; Oliveira et al, Rev Soc Bras Med Trop, 2021

Chagas Disease: recommendations

- **Donor**
- **Screen** (serology) if risk factors:
  - resident in endemic areas Latin America
  - transfusion in endemic country
  - mother from endemic área
- **Contraindications**:
  - use of organs if acute infection
  - use of heart/intestine if chronic infection
- Living donor (sero+): anti-parasitic before Tp may decrease parasite burden and transmission (scarce data)

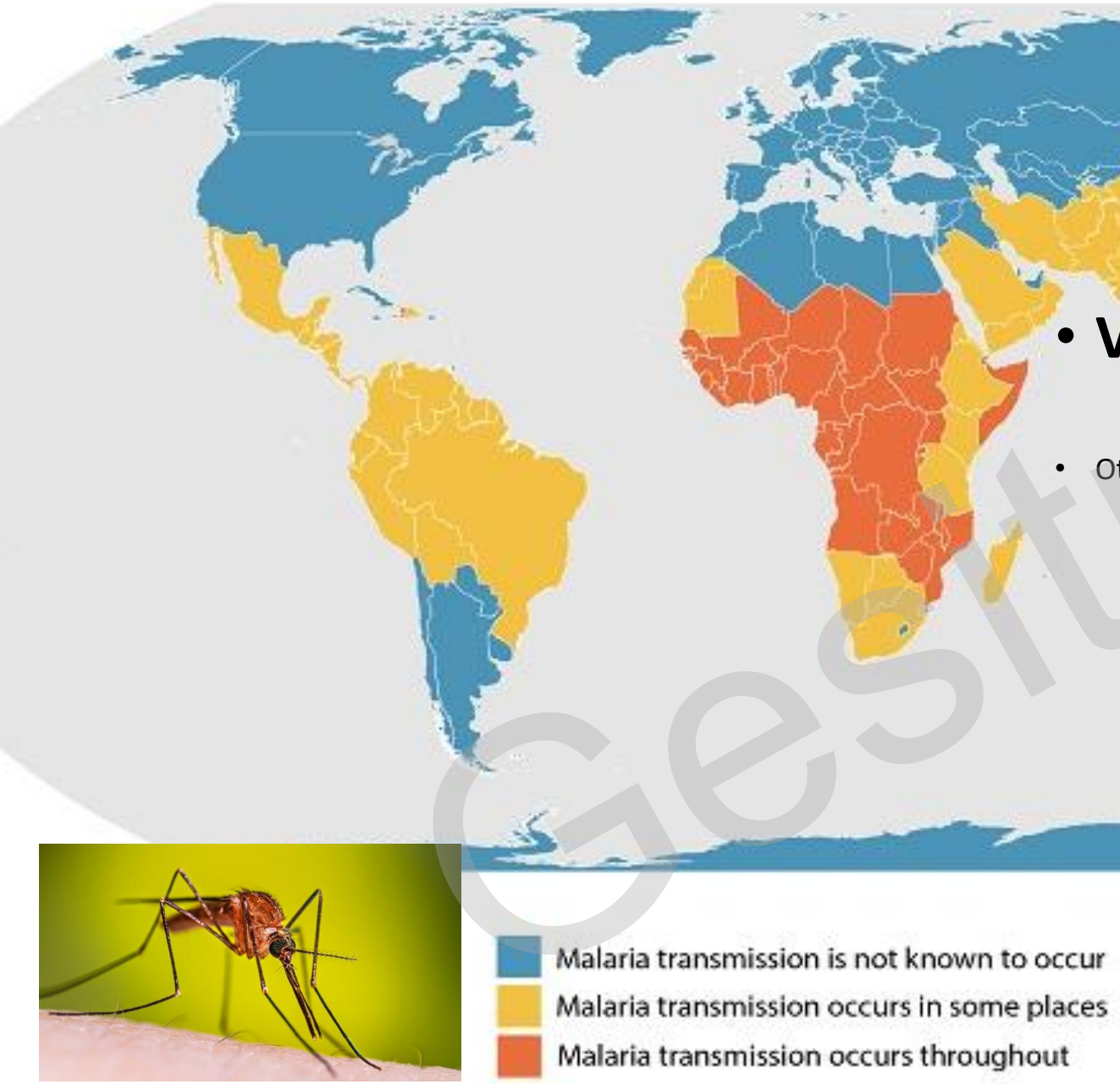
- **Recipient -**
- Monitor closely if organ from donor +
- Early treatment if DDI

- **Recipient +**
- **Consider anti-parasitic treatment before Tp (reactivation not always prevented)**
- Monitor post-Tp: early treatment if reactivation or increase parasitemia (PCR)

(Some Tp centres consider prophylaxis if: D+/R- or R+)

Documento consenso SEIMC-GESITRA-ONT 2019; Documento consenso SEIMC, GEPI, GESITRA-IC, GeSIDA, GEIRAS 2025; Martinez-Perez A, et al, Expert Rev Anti Infect Ther. 2014; Rossi Neto, Trop Med Inf Dis, 2020; Ferreira, Transpl Inf Dis, 2025; Budel, Transpl Inf Ids, 2024

Malaria

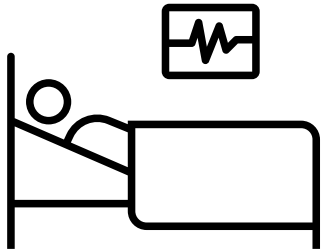


- **Vectorial transmission endemic areas**

- Other mechanisms:
  - **Airport malaria**:
    - infected mosquitoes transported by aircraft from endemic→ non-endemic country
    - local conditions allow survival upon arrival
  - **Introduced malaria**: mosquito-borne transmission of malaria from imported case in non-endemic area
  - **Induced malaria**: organ transplantation, blood transfusion, or other form of parenteral inoculation
  - **Vertical transmission**

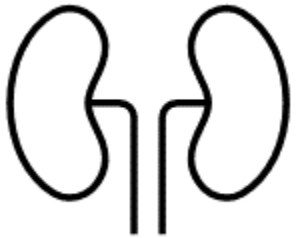
Transplant-associated malaria in SOT

- Around 50 cases of donor-derived malaria post-SOT
  - in some cases, transmission through infected blood products could not be excluded



- Majority renal transplant recipients
- Majority *P. falciparum*

- Transmission from donor products, tissues, or organs
  - infected red blood cells within the transplanted organ
  - *P. vivax*/*P. ovale* hypnozoites with liver transplantation



- *Plasmodium* spp. can survive at 4° C (days), cold preservation does not prevent transmission

- First cases donor-derived malaria reported in the late 1970s/early 1980s
- First case of donor-derived multiorgan transmission of malaria was reported in 1985

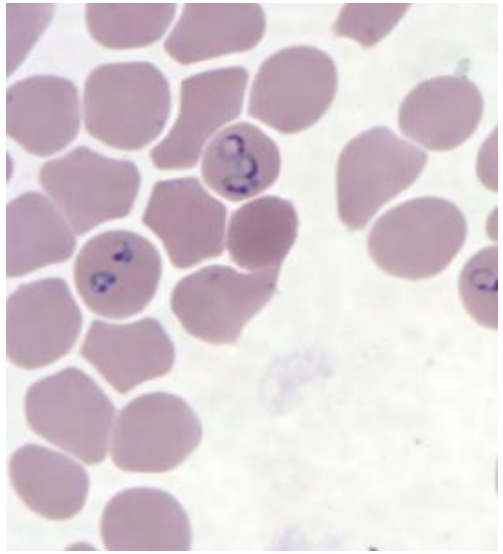
Martín-Dávila P, et al. Clin Microbiol Rev. 2008, Pierrotti LC, et al. Transplantation. 2018, Chattopadhyay R, et al. Transfusion. 2011, Cruz I, et al. J Natl Med Assoc. 1978. Lefavour GS, et al. JAMA. 1980. Johnston ID. Br Med J.1981. Holzer B, et al, Transplantation. 1985

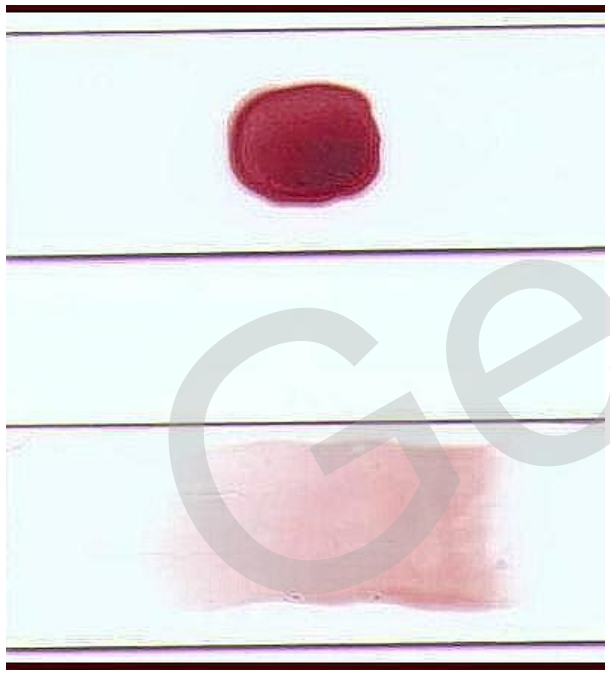
Transplant-associated malaria in SOT

- At least eleven reports of multiorgan transmission
  - Initial screening of the donors not done or negative microscopy in some.
  - Pre-donation PCR negative for one donor→ timing? *P. ovale*
  - For some, transmission only documented in some recipients, other organ recipients apparently not infected and/or received preemptive therapy.

- Prognosis of post-transplant malaria appears to depend on:
  - Type of organ transplanted
  - Species of *Plasmodium* involved (*P. falciparum*, more severe disease)
  - Immunosuppressive therapy used
  - **<u>Delay in diagnosis and initiation of antimalarial treatment in the recipient</u>**

Martín-Dávila P, et al. Clin Microbiol Rev. 2008; Chiche L, et al. Transplantation. 2003; Menichetti F, et al. Liver Transpl. 2006; Rosso F, et al. Transpl Infect Dis. 2021; Vernaza A, et al. Transpl Infect Dis. 2021. Boissier E, et al. Br J Haematol. 2020





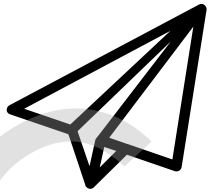
Malaria: recommendations

- Screen migrant/travelers to endemic areas in last 3 years
  - thick/thin films
  - antigen detection (RDT-malaria)
- Plasmodium PCR (deferred) to detect low or mixed parasitemia
- Malaria in donor not absolute contraindication for organ use (unless patient died of malaria)
- If malaria identified in donor, treatment should be initiated early in the recipient
- Prompt treatment if malaria detected in recipient post-transplantation

Documento consenso SEIMC-GESITRA-ONT 2019; Documento consenso SEIMC, GEPI, GESITRA-IC, GeSIDA, GEIRAS, 2025


Transplant Traveler

Your SOT recipient wants to travel…



- International travelers, few seek pre-travel advice
  - US travel clinics: 1-2% immunosuppressed
- ¿Cause of immunosuppression? ¿Current condition?

- Health insurance, extra medication (prescription)
- Bite prevention, other exposures

- Vaccine-related issues
  - live vaccines contraindicated –yellow fever, dengue
  - decreased efficacy of some vaccines

- Consider anti-malaria prophylaxis
  - dose adjustment if renal/liver disease
  - atovaquone/proguanil ?
  - SOT medication and interactions

CDC Yellow Book https://wwwnc.cdc.gov/travel/yellowbook/2024/additional-considerations/immunocompromised-travelers
https://www.hiv-druginteractions.org/checker

Other risks…

ActaDV

ORIGINAL REPORT

MJS PUBLISHING

Knowledge Gaps on Skin Cancer and Sun Protection in Organ Transplant Recipients Under Long-term Immunosuppression

Nadine WIEDENMAYER[1], Marc ROCHOLL[2,3], Alexander H. ENK[1,4] and Anke S. LONSDORF[1,4*]

[1]Department of Dermatology, University Hospital Heidelberg, Heidelberg, Germany, [2]Department of Dermatology, Environmental Medicine and Health Theory, Institute for Health Research and Education, Osnabrück University, Osnabrück, Germany, [3]Institute for Interdisciplinary Dermatological Prevention and Rehabilitation (iDerm) at the Osnabrück University, Osnabrück, Germany, and [4]Skin Cancer Center, National Center for Tumor Diseases Heidelberg, Heidelberg, Germany

SIGNIFICANCE

Organ transplant recipients are at higher risk of skin cancer due to immunosuppressive medication and sun exposure. This study evaluated how well 177 transplant patients understood sun safety and skin cancer. While many were aware of basic sun protection, substantial proportions did not fully understand important details like tanning dangers, correct sunscreen use and cancer signs. Certain groups – including heart transplant patients, those on medication for over 3 years, men and younger or older adults – knew less. Even with regular skin check-ups, knowledge gaps remain. This shows the need for ongoing, targeted education to enhance skin cancer prevention in transplant recipients.

Immunocompromised travelers . CDC Yellow Book, 2026. Camille N. Kotton, Andrew T. Kroger, and David O. Freedmanhttps://www.cdc.gov/yellow-book/hcp/travelers-with-additional-considerations/immunocompromised-travelers.html

Recommendations and Conclusions

Global | Regions | Select lang

World Health Organization

Health Topics | Countries | Newsroom | Emergencies | Data | About WHO

Emergencies

Overview | Surveillance | Operations | Research | Training | Partners | Funding

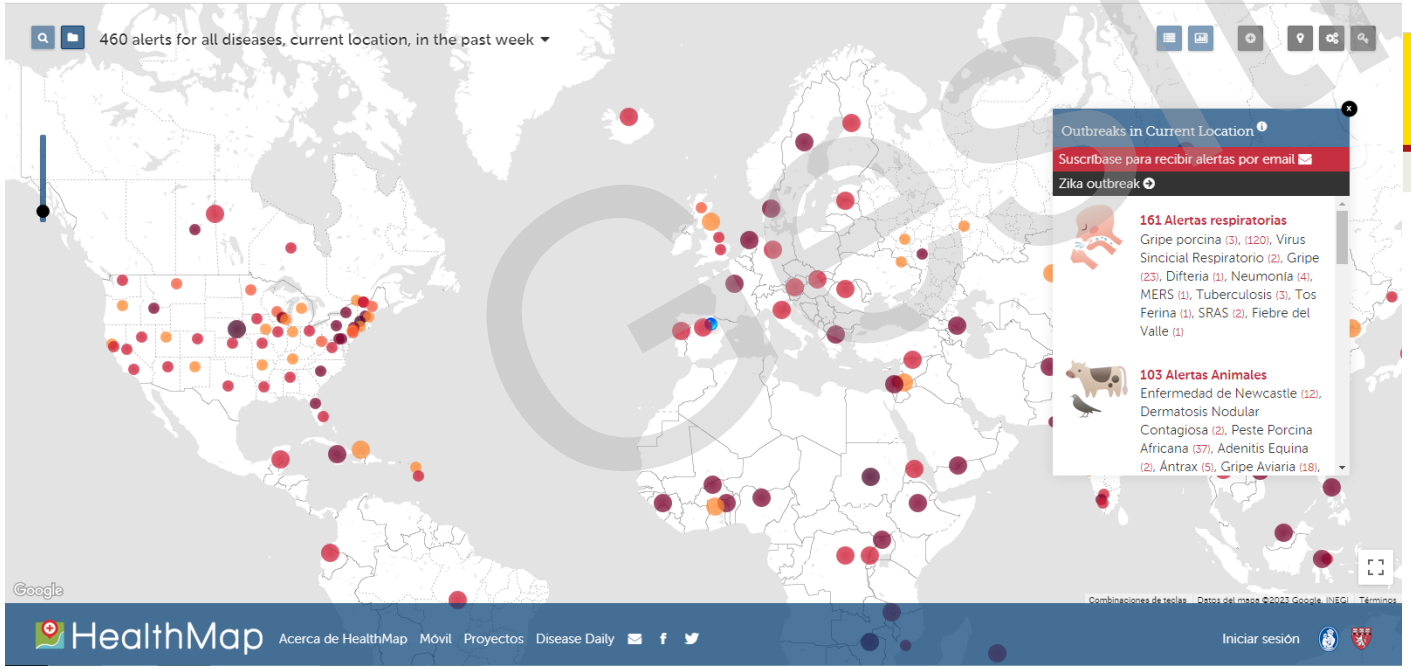
Disease Outbreak News (DONs)

Latest WHO Disease Outbreak News (DONs), providing information on confirmed acute public health events or potential events of concern.

Disease Outbreak News

21 September 2023 | Suspected triple outbreak of typhoid fever, shigellosis and cholera - Congo

Related emergency content



Español | Other Languages

CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Search

CDC Current Outbreak List

Print

Infectious disease outbreaks currently being reported on by CDC. Listings include those outbreaks for which content is currently published on the CDC website.

U.S.-Based Outbreaks

Recent investigations reported on CDC.gov

- Small Turtles - *Salmonella* Infections
  ANNOUNCED AUGUST 2023
- Ice Cream - *Listeria* Infections
  ANNOUNCED AUGUST 2023
- Suspected Fungal Meningitis - Epidural Related Surgeries in Mexico
  ANNOUNCED MAY 2023
- Backyard Poultry – *Salmonella* Infections
  ANNOUNCED MAY 2023
- Drug-resistant Infections Associated with Artificial Tears
  ANNOUNCED FEBRUARY 2023
- Raw Oysters - Norovirus Infections
  ANNOUNCED DECEMBER 2022

Travel Notices Affecting International Travelers

Please see the Travelers' Health site for a complete list.

- Level 1 - Nipah Virus in Kerala, India
  SEPTEMBER 2023
- Level 1 - Crimean-Congo Hemorrhagic Fever in Afghanistan
  SEPTEMBER 2023
- Level 2 - Diphtheria in Niger
  SEPTEMBER 2023
- Level 2 - Diphtheria in Vietnam
  SEPTEMBER 2023
- Level 2 - Diphtheria in Guinea
  SEPTEMBER 2023
- Level 1 - Dengue in Africa and the Middle East
  SEPTEMBER 2023
- Level 2 - Fungal Infections Following Surgical Procedures in Mexico
  MAY 2023

Food Safety Recalls

Dick Taylor Craft Chocolate Issues Recall for Allergy Allert on Undeclared Peanuts in "Ginger Snap Milk Chocolate"
Sep 28, 2023

Penzeys Spices Issues Allergy Alert on Undeclared Sesame Seeds in "Brady Street Cheese Sprinkle"
Sep 28, 2023

Eagle Produce LLC Recalls Whole Cantaloupe Because of Possible Health Risk
Sep 27, 2023

MINISTERIO DE SANIDAD

Castellano | Buscar

Ministerio | Áreas | Prensa y comunicación | Sanidad en datos | Servicios a la Ciudadanía | Participación Pública

Webs temáticas | Sede Electrónic@

Traducir | Está usted en: > Áreas > Alertas y emergencias sanitarias

- Quiénes somos
- Alertas de salud pública de actualidad
- Vigilancia en salud pública
- Sistema Nacional de Alerta Precoz y Respuesta Rápida (SIAPR)
- Inteligencia epidemiológica
- Análisis de situación y evaluación de riesgo
- Actividades de preparación y respuesta
- Reglamento Sanitario Internacional

Alertas y emergencias sanitarias

CCAES Centro de Coordinación de Alertas y Emergencias Sanitarias

El Centro de Coordinación de Alertas y Emergencias Sanitarias, creado en el año 2004 (ORDEN SCO/564/2004, 27 de febrero), es un Centro dependiente de la Dirección General de Salud Pública (Real Decreto 735/2020, de 4 de agosto) del Ministerio de Sanidad.

Tiene como función, coordinar la gestión de la información y apoyar en la respuesta ante situaciones de alerta o emergencia sanitaria nacional o internacional que supongan una amenaza para la salud de la población. Para ello se ha creado el Sistema Nacional de Alerta Precoz y Respuesta Rápida (SIAPR). El CCAES es, además, la unidad responsable de la elaboración y desarrollo de los planes de preparación y respuesta para hacer frente a las amenazas de salud pública.

Actividades

Documento de Consenso del Grupo de Estudio de la Infección en el Trasplante (GESITRA) perteneciente a la Sociedad Española de Enfermedades Infecciosas y Microbiología Clínica (SEIMC) y la Organización Nacional de Trasplantes (ONT) sobre los Criterios de Selección del Donante de Órganos Sólidos en Relación a las Enfermedades Infecciosas

2019

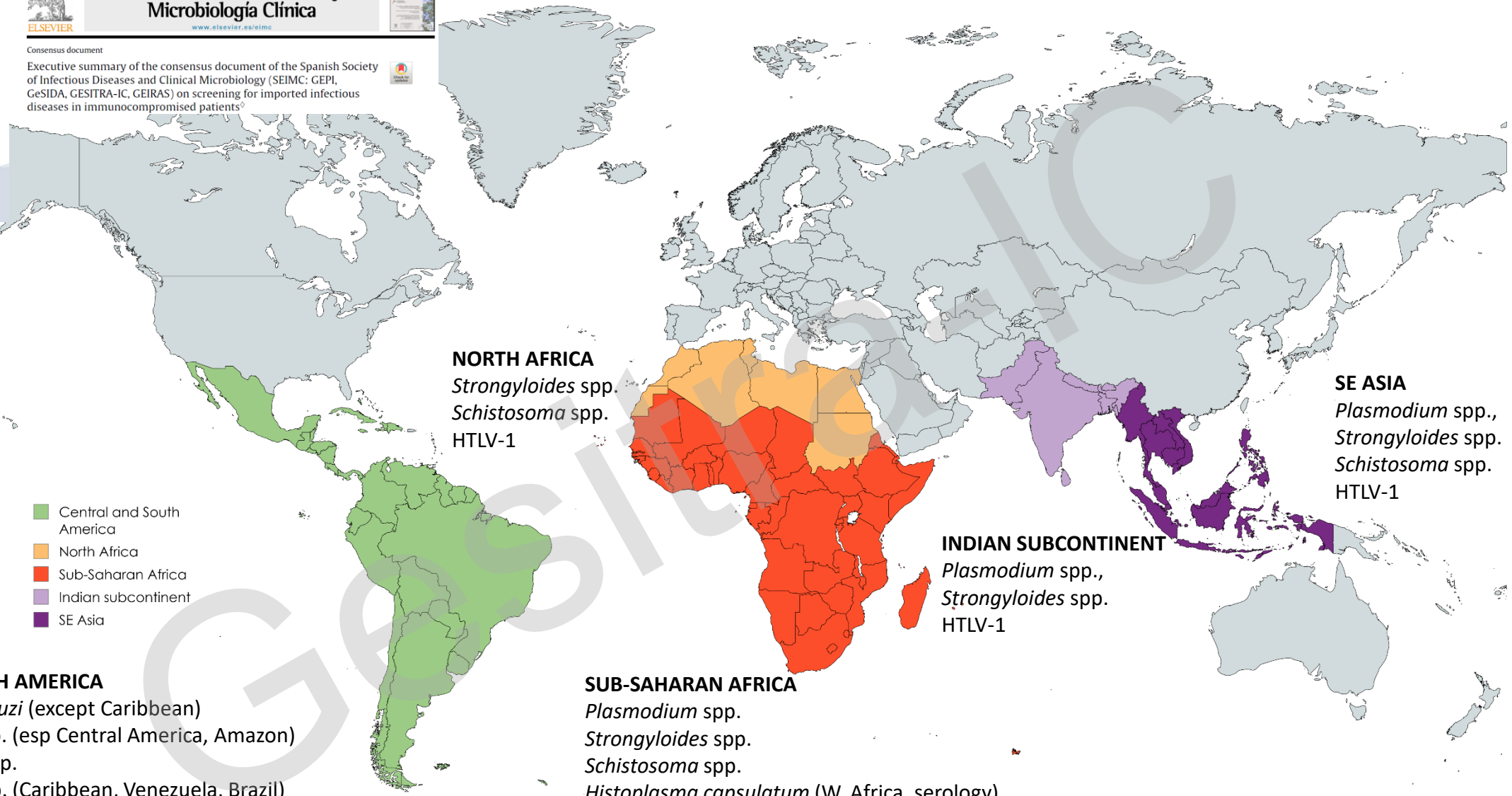
Enfermedades Infecciosas y Microbiología Clínica 43 (2025) 611–615

Enfermedades Infecciosas y Microbiología Clínica

www.elsevier.es/eimc

Consensus document

Executive summary of the consensus document of the Spanish Society of Infectious Diseases and Clinical Microbiology (SEIMC: GEPI, GeSIDA, GESITRA-IC, GEIRAS) on screening for imported infectious diseases in immunocompromised patients◊



CENTRAL-SOUTH AMERICA
Trypanosoma cruzi (except Caribbean)
Plasmodium spp. (esp Central America, Amazon)
Strongyloides spp.
Schistosoma spp. (Caribbean, Venezuela, Brazil)
Histoplasma capsulatum (serology)
Coccidioides immitis
Arboviruses
HTLV-1

NORTH AFRICA
Strongyloides spp.
Schistosoma spp.
HTLV-1

SUB-SAHARAN AFRICA
Plasmodium spp.
Strongyloides spp.
Schistosoma spp.
Histoplasma capsulatum (W. Africa, serology)
HTLV-1

INDIAN SUBCONTINENT
Plasmodium spp.,
Strongyloides spp.
HTLV-1

SE ASIA
Plasmodium spp.,
Strongyloides spp.
Schistosoma spp.
HTLV-1

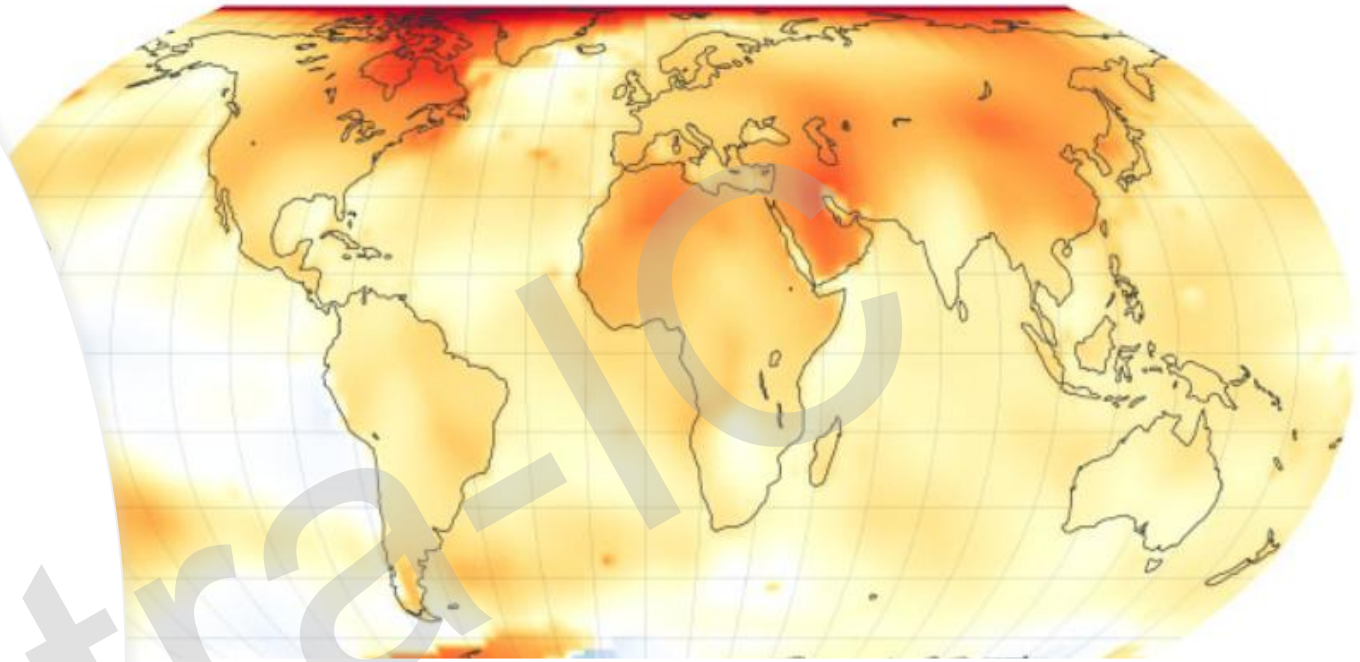
Created with mapchart.net

Tabla 5.3.1. Técnicas de diagnóstico y/o cribado que se usan en donantes/receptor de TOS/TPH

Microorganismo/s	Técnica de diagnóstico
T. cruzi	Serología.
Plasmodium spp	PCR de forma diferida para la detección de parasitemias bajas e infecciones mixtas Si PCR no está disponible, cribado mediante frotis y gota gruesa de sangre periférica y PDR
Strongyloides spp.	Serología y si es posible, combinación con estudio coproparasitológico
Schistosoma spp.	Serología
Filarias	Estudio de microfilarias en sangre
H. capsulatum *C. immitis*	Serología. La inmunodifusión es la técnica serológica disponible en los centros de referencia españoles. En el caso concreto de la histoplasmosis diseminada, detección de antígeno en orina.
M. tuberculosis	PT y/o IGRA en donantes vivos. En donantes fallecidos la experiencia es limitada y no se puede hacer una recomendación al respecto.
HTLV	Serología
VDEN	Para el cribado se recomienda detección de antígeno NS1 y/o PCR y detección de anticuerpo IgM anti-NS1.
VCHIK	Si está indicado por síntomas o riesgo epidemiológico, PCR
VZIK	Si está indicado por síntomas o riesgo epidemiológico, PCR
VNO	Si está indicado por síntomas o riesgo epidemiológico, PCR

Globalization and Emerging Infectious Diseases

- Climate change
- Population movements: international travel and migration
- International commerce and modern transport
- Migratory birds
- Lack of resources



Sources: Heat map showing temperature anomaly for 2021, compared to 1951-1980 average. Image: NASA: Earth Observatory

Conclusions

1. GEOGRAPHIC MEDICINE-CHANGING SCENARIO
2. RARE CASES-HIGH INDEX OF SUSPICION
3. CARE WITH IMMUNO-COMPROMISED TRAVELER
4. FOLLOW AVAILABLE GUIDELINES
5. UPDATED SOURCES OF INFORMATION AND ALERTS

Expect the unexpected…

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