Tropesygdomme

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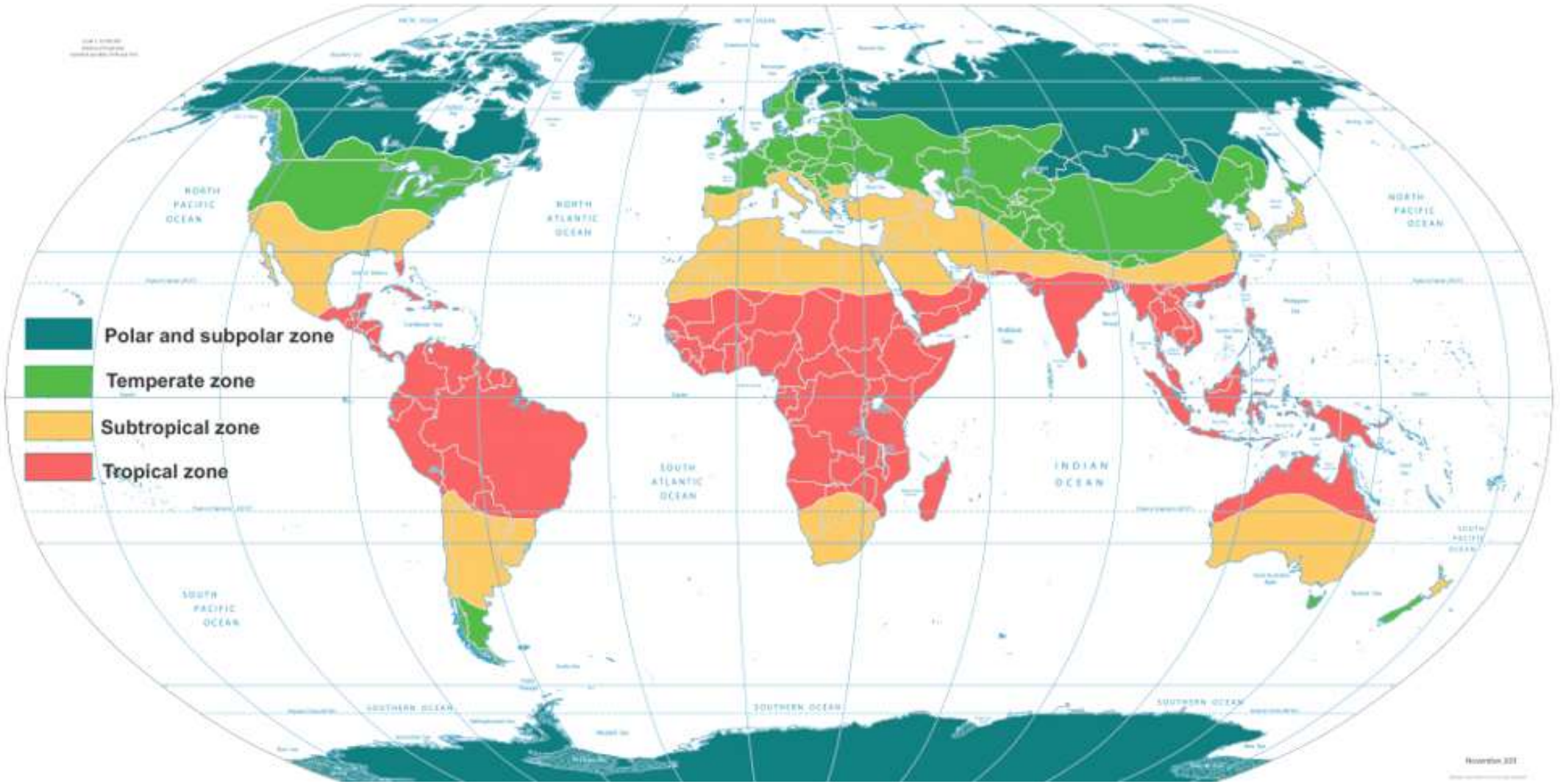
Hvad er en tropesygdom?

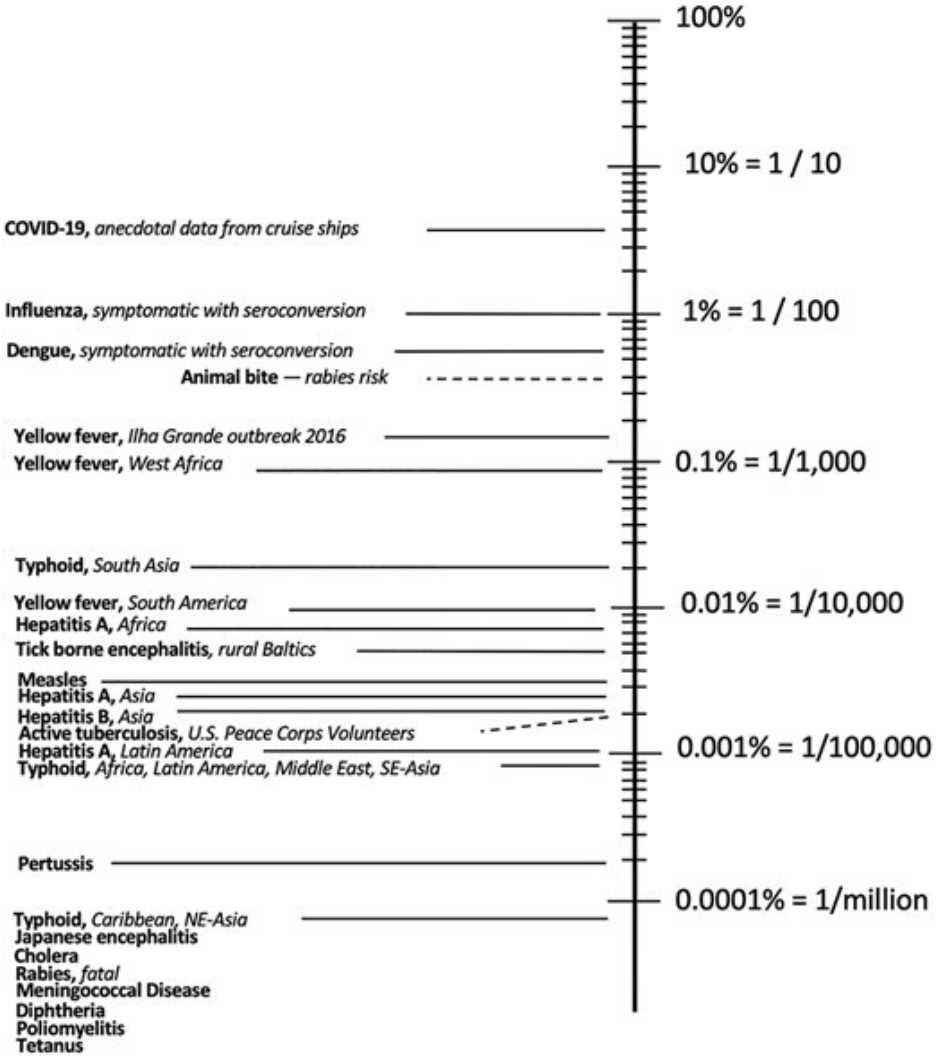
Political Map of the World, November 2011



Tropesygdomme hos danske rejsende

- Malaria
- Dengue feber
- Intestinale protozoa
  - Giardiasis, cryptosporidosis, amoebiasis
- Tyfus/paratyfus
- Rickettsioser (plettyfus)
- Kutan leishmaniasis
- Schistosomiasis
- Larva cutanea migrans

Vaccine preventable diseases



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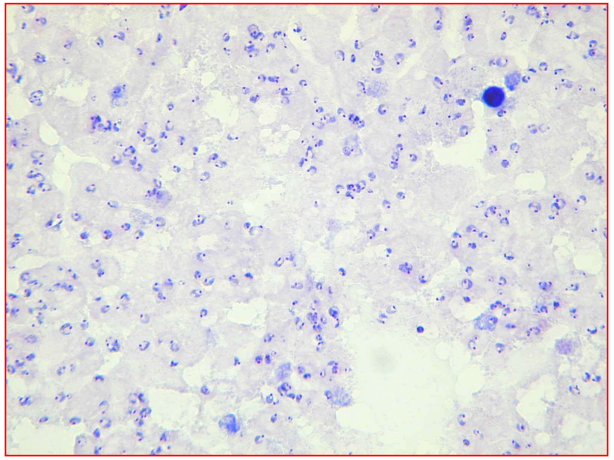
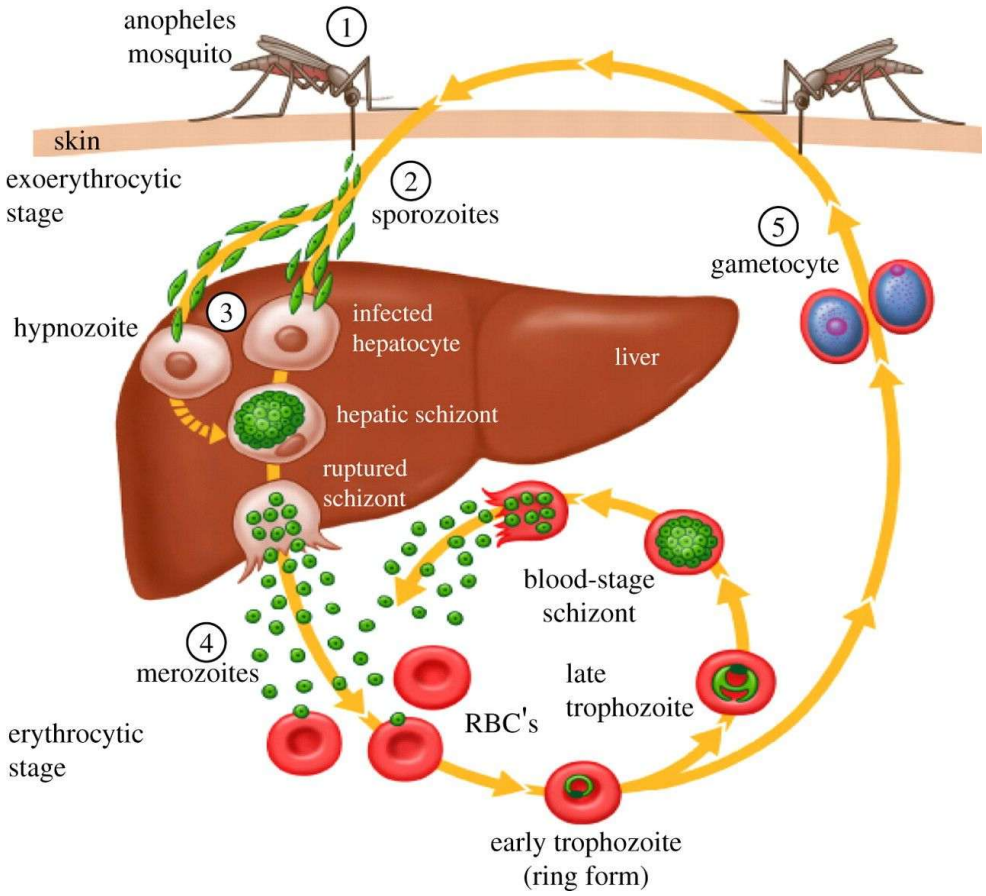
Malariaparasitter

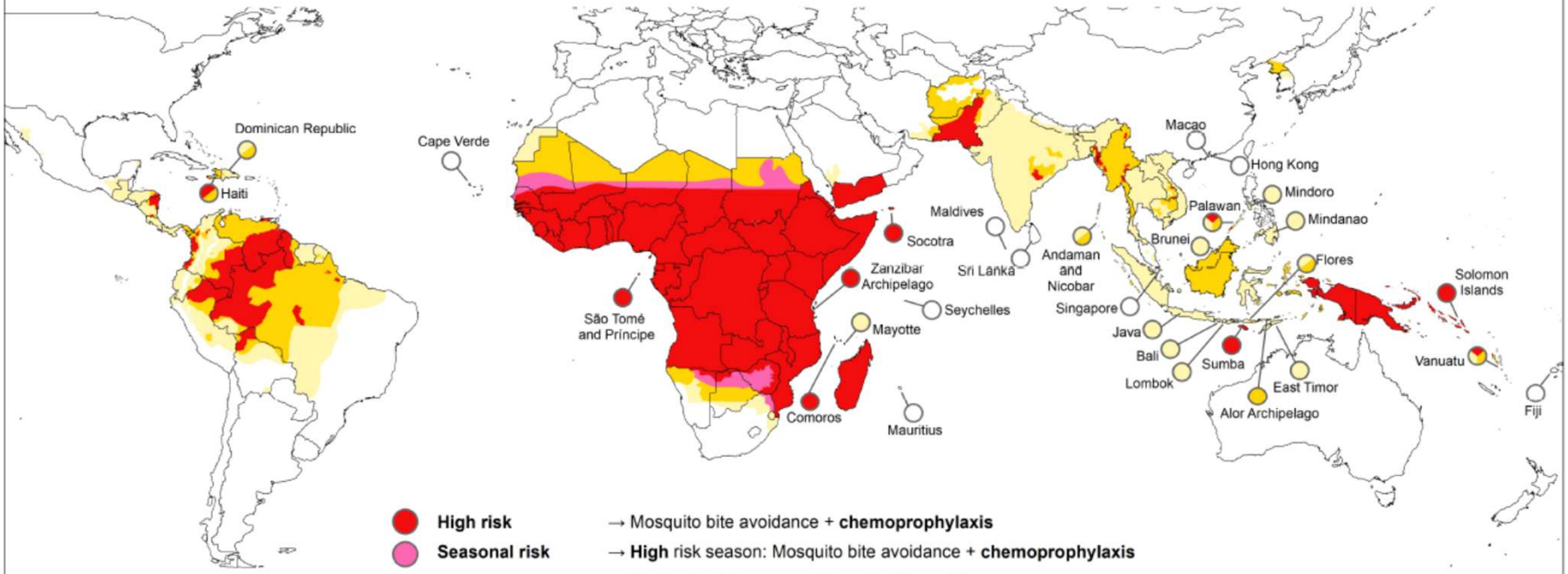
- ***Plasmodium falciparum***
- ***Plasmodium vivax***
- ***Plasmodium malariae***
- ***Plasmodium ovale***
- ***(Plasmodium knowlesii)***

VMO-former




anopheles
mosquito
1
skin
exoerythrocytic
stage
2
sporozoites
5
gametocyte
hypnozoite
3
infected
hepatocyte
liver
hepatic schizont
ruptured
schizont
blood-stage
schizont
4
merozoites
late
trophozoite
RBC's
erythrocytic
stage
early trophozoite
(ring form)

Malaria 2024



High risk → Mosquito bite avoidance + **chemoprophylaxis**

Seasonal risk → **High** risk season: Mosquito bite avoidance + **chemoprophylaxis**

→ **Moderate** risk season: Mosquito bite avoidance
(in risk situations: also carry a stand-by emergency treatment)

Moderate risk → Mosquito bite avoidance
(in risk situations: also carry a stand-by emergency treatment)

Low risk → Mosquito bite avoidance

No risk, rare sporadic cases may nevertheless occur

This map should always be used in combination with the recommendations on the corresponding country page on www.healthytravel.ch.

Source: World Malaria Reports 2020, 2021, 2022, 2023, adapted by Olivia Veit, ECTM.

The boundaries, names and designations used are not intended as a legal status of the countries, territories or cities and their authorities or on the course of their geographical and political boundaries.

Expertenkomitee für Reisemedizin
Comité d'experts pour la médecine des voyages
Comitato di esperti per la medicina dei viaggi
Expert committee for travel medicine

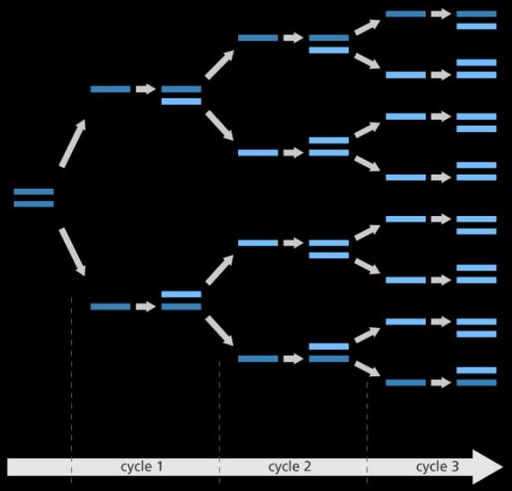
Hvornår skal man mistænke malaria?

- Hvis du får feber eller influenza-symptomer og:
  - Har opholdt dig i et malaria endemisk område i mere end syv dage.

  eller
  - Har været i et malaria endemisk område indenfor de seneste tre måneder (vivax og ovale indenfor 3 år).

Malariadiagnostik

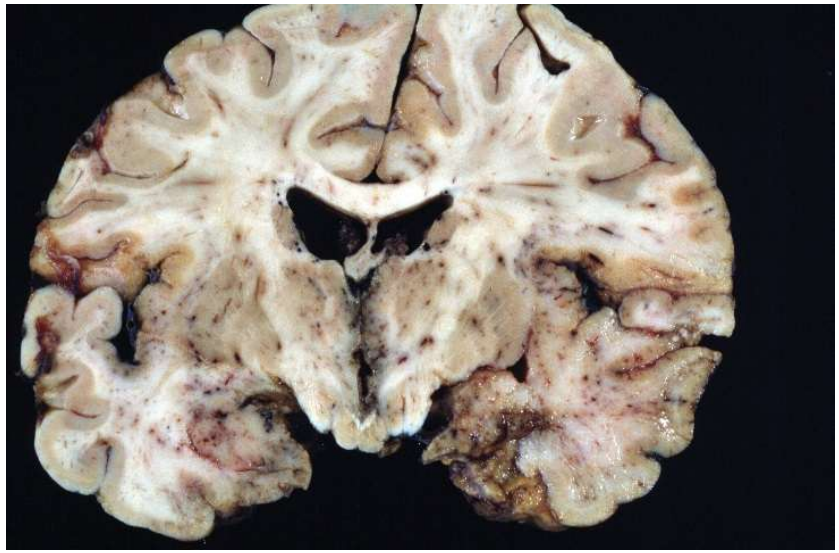
- Direkte mikroskopi
- Rapid Diagnostic Tests
- NAT-test: LAMP/PCR
- (Serologi)



Criteria of `severe malaria´ – treat as severe malaria if ≥1 of the following complications is present:	
Prostration	Generalized weakness, unable to sit, stand or walk without assistance
Cerebral malaria	Impaired consciousness (GCS <11 in adults; BCS <3 in children), coma, seizures
Respiratory distress	Hypoxia, pulmonary oedema, acute respiratory distress syndrome (ARDS)
Acute renal failure	Urine output <0.4ml/kg/h or creatinine >265 µmol/l [>3.0 mg/dl] or urea >20 mmol/l
Acidosis	Arterial pH <7.3, plasma bicarbonate <15 mmol/l, lactate ≥5 mmol/l or BE <8mmol/l
Circulatory collapse	Shock (compensated [no hypotension but capillary refill time ≥3 sec or temperature gradient on leg (mid to proximal limb)]; decompensated shock [syst. RR <80mmHg in adults or <70 mmHg in children])
Jaundice	Bilirubin >50 µmol/l [>3 mg/dl] with a parasite count >100'000/µl (>2%) in *P. falciparum* or >20'000/µl (0.4%) in *P. knowlesi* malaria
Hypoglycemia	Blood glucose level <2.2mmol/l [<40 mg/dl]
Severe anaemia	Adults: Hb <7 g/dl or Hct <20%; children <12 years: Hb <5 g/dl or Hct <15% together with a parasite count >10'000/µl
Impaired coagulation	Spontaneous bleedings, disseminated intravascular coagulation (DIC)
Repeated vomiting	Inability to take oral medication
Hyperparasitaemia	≥2% (100'000/µl) in patients from malaria non-endemic regions [38] ≥4% in patients from and permanently living in a malaria holo-/hyperendemic region
≥3 days symptoms*	As indirect indicator of potentially high parasitaemia in the absence of laboratory values

Criteria adapted from [29]; * Swiss TPH in-house criterion.

Kompliceret malaria



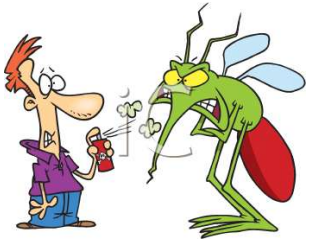
1. Treatment of uncomplicated malaria

	1st-line treatment	Alternative treatment
P. falciparum	▪ **Artemether/lumefantrine (A/L)**[♦ ◊] (1 tabl. = 20 mg artemether/120 mg lumefantrine) 2 doses/day for 5 days[♦ •]: 0, 8, 24, 36, 48, 60, 72, 84, 96, 108 h 5[•]–14 kg: 1 tabl./dose [total 10 tabl.] 15–24 kg: 2 tabl./dose [total 20 tabl.] 25–34 kg: 3 tabl./dose [total 30 tabl.] ≥35[†] kg: 4 tabl./dose [total 40 tabl.] OR ▪ **Dihydroartemisinin/piperaquine (DHA/PPQ)**[♦ ø] (1 tabl. = 40 mg dihydroartemisinin/320 mg piperaquine) 1 dose/day for 3 days = at 0 h, 24 h, 48 h: 5[•]–<7 kg: ¼ tabl./dose [total ¾ tabl.] 7–<13 kg: ½ tabl./dose [total 1½ tabl.] 13–<24 kg: 1 tabl./dose [total 3 tabl.] 24–<36 kg: 2 tabl./dose [total 6 tabl.] 36–<75 kg: 3 tabl./dose [total 9 tabl.] >75 kg: 4 tabl./dose [total 12 tabl.]	▪ **Atovaquone/proguanil (A/P)**[◊] (1 tabl. = 250 mg atovaquone/100 mg proguanil) 1 dose/day for 3 days = at 0 h, 24 h, 48 h: 11–20 kg: 1 tabl./dose [total 3 tabl.] 21–30 kg: 2 tabl./dose [total 6 tabl.] 31–40 kg: 3 tabl./dose [total 9 tabl.] >40 kg: 4 tabl./dose [total 12 tabl.][†] OR ▪ **[Mefloquine**[❖] (1 tabl. = 250 mg mefloquine) 25 mg/kg given in 1–4 doses (if ≥2 doses[#] separate doses by 6–8 h and give the tablets of each dose over 30 min): 5–10 kg: ½–1 tabl. 10–20 kg: 1–2 tabl. 20–30 kg: 2–3 tabl. (#2 + 1 tabl.) 30–45 kg: 3–4 tabl. (#2 + 2 tabl.) 45–60 kg: 5 tabl. (#3 + 2 tabl.) >60 kg: 6 tabl. (#3 + 2 + 1 tabl.) >90 kg: 9 tabl. (#3 + 3 + 3 tabl.) >120 kg: 12 tabl. (#3 + 3 + 3 + 3 tabl.)]
P. vivax *P. ovale* *P. cynomolgi*	▪ **Artemether/lumefantrine (A/L)**[Δ] Dosage analogue to *P.f.*, but 3 day regimen: 0, 8, 24, 36, 48, 60 h OR ▪ **Dihydroartemisinin/piperaquine (DHA/PPQ)** (see *P.f.*)[Δ ø] OR ▪ **Chloroquine**[‹] Initially 10 mg base*/kg p.o. [adult: 600 mg] followed by 5 mg base*/kg p.o. [adult: 300 mg] after 12, 24, 36 h (alternatively: 6, 24, 48 h) *followed by* (after ruling out G6PD-deficiency) **Primaquine** 0.5 mg^ base[§]/kg/day [max. 30 mg] for 14 days **+ if initially treated with A/L: Chloroquine•** adults: 100–150mg/day for 14 days; children: *5–25 kg: 25mg/d, 25–35 kg: 50mg/d, 35–45 kg: 75mg/d* for 14 days OR [*Tafenoquine 300 mg single dose*][◆]	▪ **Atovaquone/proguanil (A/P)**[◊](see *P.f.*) OR ▪ **[Mefloquine**[❖] (see *P.f.*)] *followed by* (after ruling out G6PD-deficiency) **Primaquine** 0.5 mg^ base[§]/kg/day [max. 30 mg] for 14 days **+ Chloroquine•** adults: 100–150mg/day for 14 days; children: *5–25 kg: 25mg/d, 25–35 kg: 50mg/d, 35–45 kg: 75mg/d* for 14 days
P. malariae	▪ **Dihydroartemisinin/piperaquine (DHA/PPQ)**[ø] (see *P.f.*) OR ▪ **Chloroquine** Initially 10 mg base*/kg p.o. [adult: 600 mg] followed by 5 mg base*/kg p.o. [adult: 300 mg] after 12, 24, 36 h (alternatively: 6, 24, 48 h)	▪ **Mefloquine** (see *P.f.*)[❖] OR ▪ **[Artemether/lumefantrine** (see *P.f.*)][‹‹] OR ▪ **[Atovaquone/proguanil (A/P)**(see *P.f.*)][‹‹]
P. knowlesi	▪ **Artemether/lumefantrine** (see *P.f.*)[‡] OR ▪ **Dihydroartemisinin/piperaquine** (see *P.f.*)[‡ø]	▪ **Chloroquine** (see *P.v./o./c./m.*), if unavailable: ▪ **Atovaquone/proguanil or mefloquine** (see *P.f.*)

	1st-line treatment	2nd-line treatment
***P. falciparum* (*P. vivax*[Δ], *P. knowlesi*)**	**Artesunate i.v.** adults and children >20kg: 2.4 mg/kg; children <20kg: 3.0 mg/kg slow i.v. bolus injection over 5 minutes at 0h, 12 h and 24 h, then every 24 h[ψ] *switch to oral therapy as soon as the patient tolerates oral medication (but not before completing at least 24 h of i.v. treatment) and give a complete course (to be started 8–12 h after the last i.v. dose of artesunate) of:* ▪ **Artemether/lumefantrine**[◊] OR ▪ **Dihydroartemisinin/piperaquine**[◊] OR ▪ **Atovaquone/proguanil**[◊] (*regimens: see uncomplicated malaria*) *if the situation does not allow for switching to oral therapy, continue Artesunate for a total of 7 days and add* **Doxycycline i.v.:** adults: 100 mg BID; children (only if ≥8 years old): 2–4 mg/kg divided in 2 doses for a total of 7 days OR **Clindamycin i.v.:** adults: 10 mg/kg loading dose, followed by 5 mg/kg every 8 h for a total of 7 days; children: 15–20 mg/kg divided in 3 doses for a total of 7 days ☝ relevant key points of clinical management and adjunct treatment of severe malaria see 2.4. & 2.5	**Quinine dihydrochloride salt* i.v.** 1. loading dose[•†]: 20mg salt (=16.5 base)/kg over 4 h 2. continuation phase: 10 mg salt (=8.3 base)/kg over 4 h starting 8 h after initiation of treatment followed by 10 mg/kg over 4 h every 8h (=alternate 4 h drug administration and 4 h drug free interval), max. dosage 600 mg TID[‡§ς] *switch to oral medication as soon as possible (but not before completing at least 24–48 h of i.v. treatment) and give a complete course (to be started 8–12 h after the last i.v. dose of quinine) of:* ▪ **Artemether/lumefantrine**[◊] OR ▪ **Atovaquone/proguanil**[◊] OR ▪ **Dihydroartemisinin/piperaquine**[◊] *(see regimens in table above)* OR ▪ **Quinine sulfate** 10 mg salt*(=8.3 mg base)/kg TID max. dosage: 600–650 mg TID for 7 days **+ Doxycycline p.o.:** adults: 100 mg BID; children (only if ≥8 years old): 2–4 mg/kg divided in 2 doses for a total of 7 days OR **+ Clindamycin p.o.:** adults and children: 5 mg/kg every 8 h for a total of 7 days

Malariaforebyggelsens ABCD

- **Awareness:** Opmærksom på risikoen for malaria
  - Undersøg før afrejse om der er risiko for malaria i det område du rejser til.



- **Bite protection:** Myggestiksprofylakse
  - Beklædning – lange ærmer og benklæder
  - Myggebalsam – DEET eller icaridin (Autan®) 20-30 %
  - Imprægneret myggenet
  - Insektspray

- **Chemoprophylaxis:** Kemoprofylakse
  - Malariapiller anbefales til områder med stor risiko (> 1:10.000/mnd.)

- **Diagnosis:** Diagnostik
  - Malaria skal altid mistænkes hvis du får feber eller influenza-symptomer og:
    - Har opholdt dig i et malaria endemisk område i mere end syv dage.
    - Har været i et malaria endemisk område indenfor de seneste tre måneder. (vivax og ovale indenfor 3 år)

Arbovirus

Virus Family	Viral Genus	Virus	Vector Species
	Orthobunyavirus	California serogroup viruses	Mosquito (Aedes sp.)
	Phlebovirus	Rift Valley Fever virus	Mosquito (various)
Bunyaviridae	Phlebovirus	Toscana virus	Sandfly (Phelbotomus sp.)
	Phlebovirus	Phlebotomus fever virus	Sandfly (phelbotomus)
	Phlebovirus	Sandfly Fever Naples virus	Sandfly (phelbotomus)
	Phlebovirus	Sandfly Fever Sicilian virus	Sandfly (phelbotomus)
	Phlebovirus	Heartland virus	Tick (A. americanum)
	Phlebovirus	Severe fever with thrombocytopenia syndrome virus	Tick (H. longicornis)
	Nairovirus	Crimean Hemorrhagic Fever virus	Tick (Hyalomma sp.)
Flaviviridae	Flavivirus	Dengue Virus	Mosquito (Aedes sp.)
	Flavivirus	Zika virus	Mosquito (Aedes sp.)
	Flavivirus	Yellow fever virus	Mosquito (Aedes sp.)
	Flavivirus	West Nile Virus	Mosquito (Culex sp.)
	Flavivirus	St. Louis Encephalitis virus	Mosquito (Culex sp.)
	Flavivirus	Japanese encephalitis virus	Mosquito (Culex sp.)
	Flavivirus	Murray Valley encephalitis virus	Mosquito (Culex sp.)
	Flavivirus	Usutu	Mosquito (various)
	Flavivirus	Omsk Hemorrhagic fever virus	Tick (dermacentor)
	Flavivirus	Kyasanur Forest Diesease virus	Tick (Haemaphysalis sp.)
	Flavivirus	Tick-borne encephalitis virus	Tick (Ixodes and Haemaphysalis sp.)
	Flavivirus	Powassan virus	Tick (Ixodes sp.)
Orthomyxoviridae	Thogotovirus	Bourbon virus	Tick (A. americanum)
Reoviridae	Coltivirus	Colorado tick fever	Tick (dermacentor)
Rhabdoviridae	Vesiculovirus	Vesicular Stomatitis (New Jersey) virus	Sandflies (Lutz. Sp) | Mosquitos (various)
	Vesiculovirus	Chandipura	Sandlfy (Phlebotomus Sp.)
Togaviridae	Alphavirus	Barmah Forest Virus	Mosquito (Aedes and Culex sp.)
	Alphavirus	Chikungunya virus	Mosquito (Aedes sp.)
	Alphavirus	Venezuelan equine encephalitis virus	Mosquito (Culex sp.)
	Alphavirus	Sindbis virus	Mosquito (Culex sp.)
	Alphavirus	Equine encephalitis virus	Mosquito (Culex sp.)
	Alphavirus	Mayaro virus	Mosquito (Haemagogus sp.)

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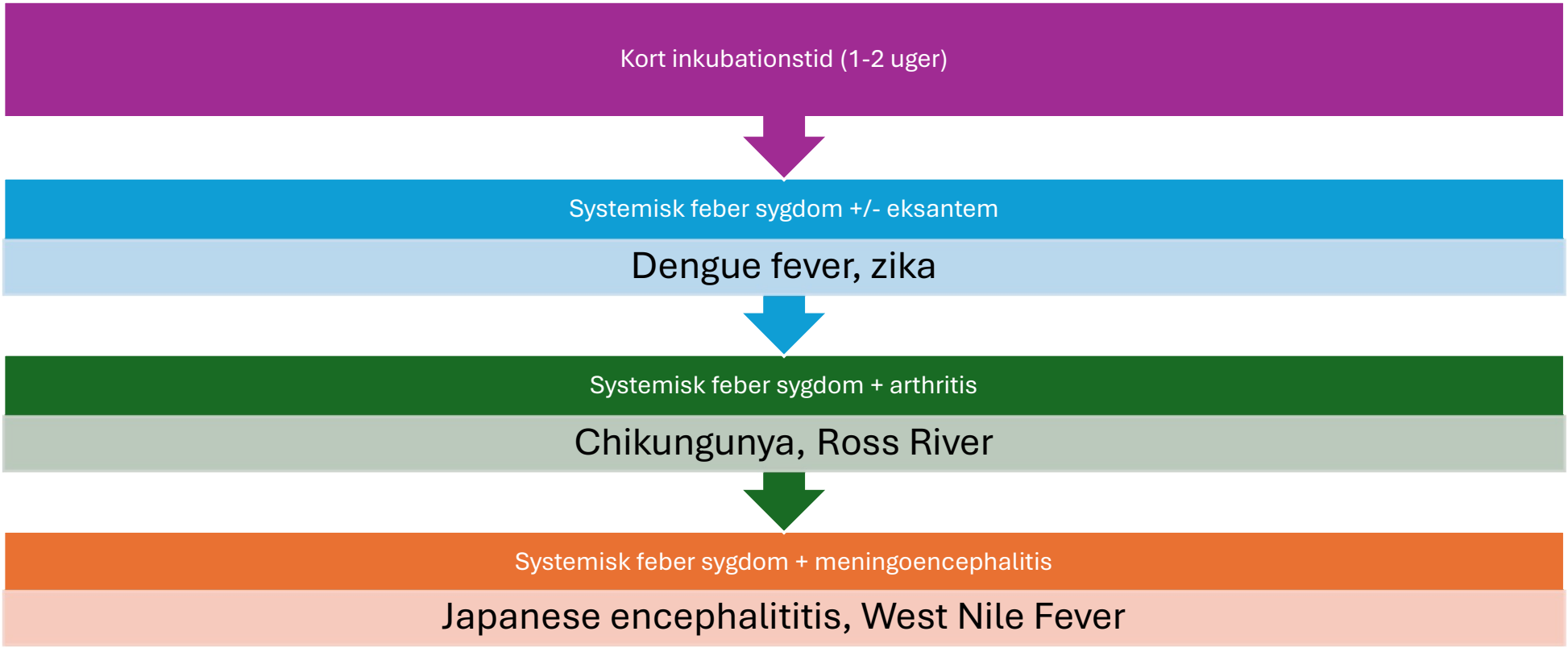
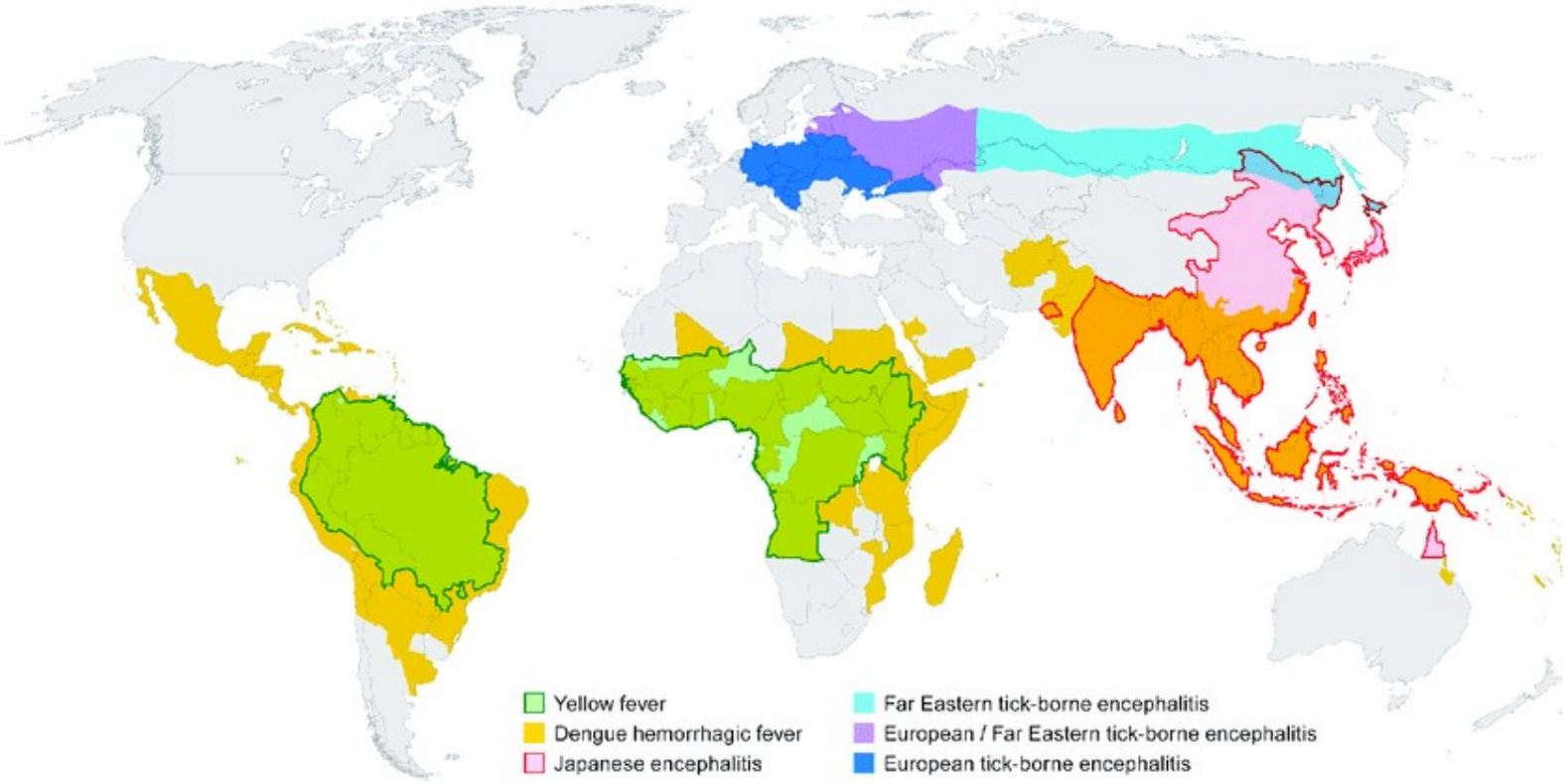
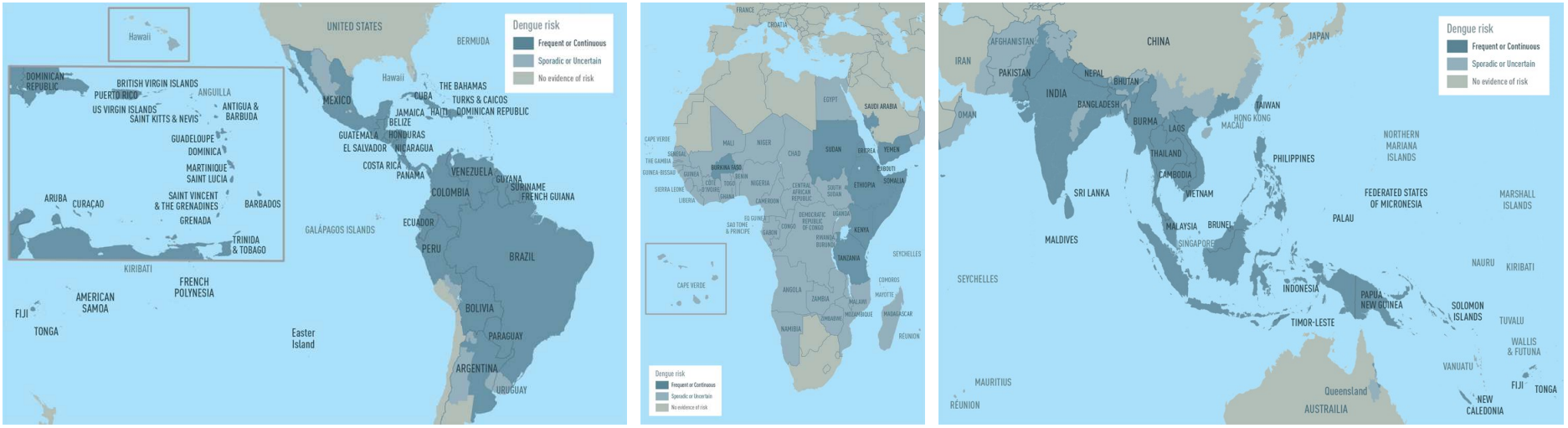
Arbovirus klinik



Arbovirus infektioner



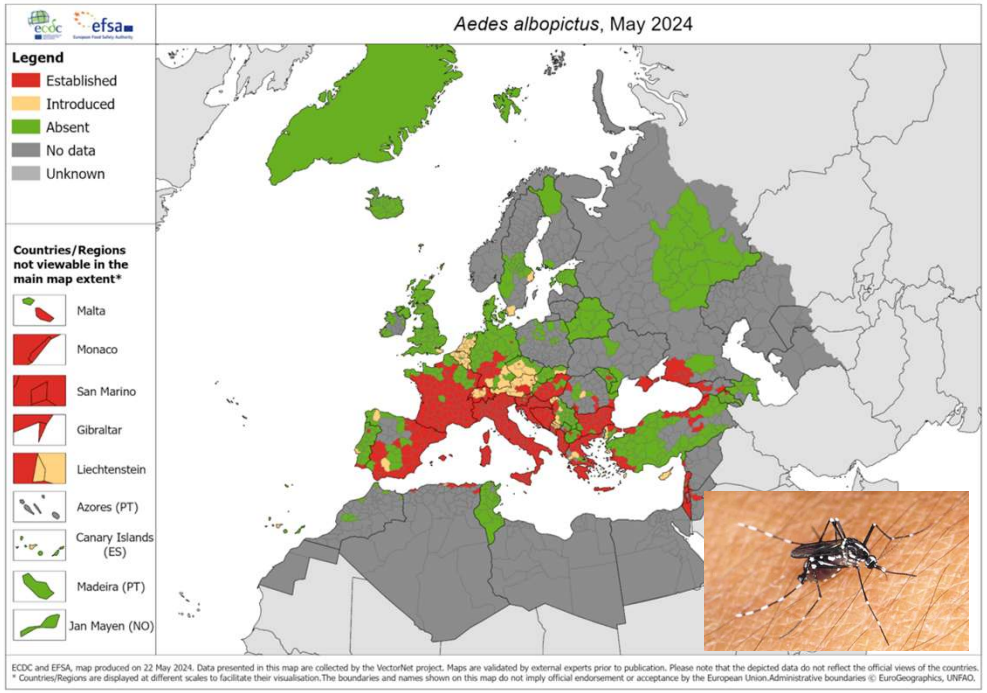
Dengue feber: Epidemiologi

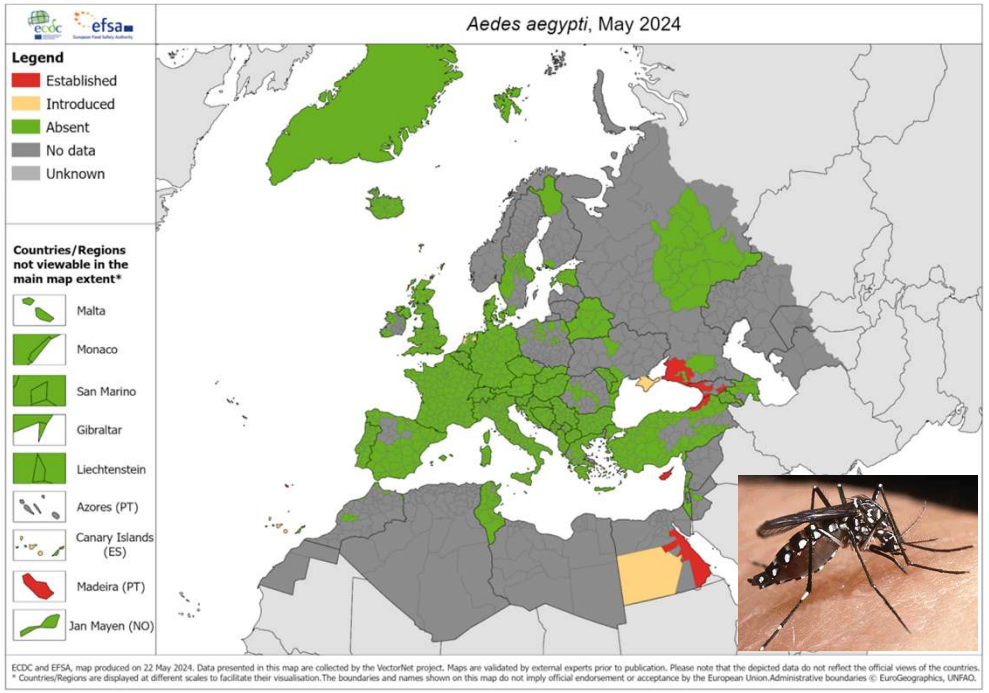


- Forekommer endemisk i 128 lande i subtropiske og tropiske områder
- 3.9 milliarder bor i områder med risiko for at få dengue feber
- Globalt omkring 400 millioner tilfælde om året
  - 300 millioner asymptomatiske (75 %)
  - 100 millioner symptomatiske (25 %) med 21.000 dødsfald
- Sekundær infektion er årsag til 84 % af tilfælde med svær dengue
- Incidensen af dengue feber er steget med en faktor 30 over de seneste 50 år
  - Klimaforandringer, befolkningstilvækst, urbanisering, fattigdom m.m.

1. World Health Organization. Dengue in the WHO European Region. https://www.euro.who.int/__data/assets/pdf_file/0009/234198/Dengue-in-the-WHO-European-Region.pdf. Retrieved August 2021.; 2. Biswal S, et al. N Engl J Med. 2019;381(21):2009-2019 and supplementary appendix.; 3. Guzman MG, et al. Nat Rev Dis Primers. 2016;2:16055.; 4. Yang X, et al. J Travel Med. 2021;28(8):taab146.; 5. World Health Organization. Dengue and severe dengue. https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue. Retrieved August 2022.; 6. Jing Q and Wang M. Glo Health J. 2019;3(2):37-45.; 7. Morin CW, et al. Environ Res Lett. 2022;064042.; 8. Tozan Y, et al. Am J Trop Med Hyg. 2019;100(6):1525-1533. Yang X: JTM 2021.

Udbredelse af *A. aegypti* og *A. albopictus*

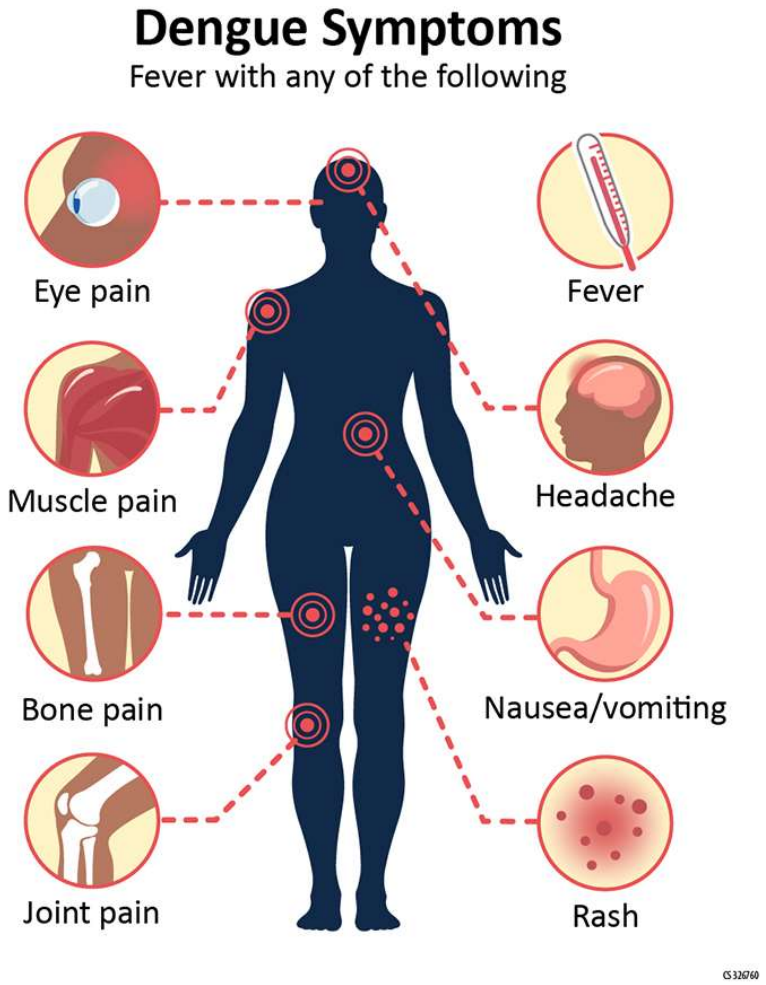




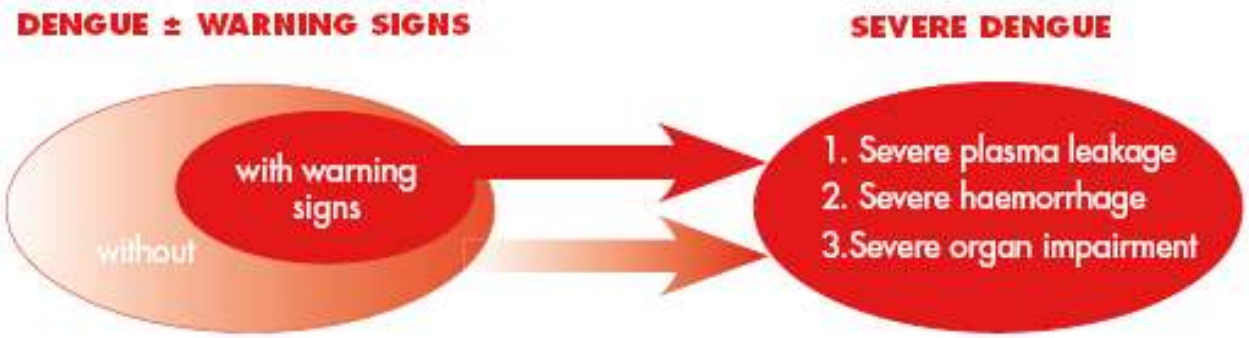
https://www.ecdc.europa.eu/en/publications-data/aedes-aegypti-current-known-distribution-may-2024

https://www.ecdc.europa.eu/en/publications-data/aedes-albopictus-current-known-distribution-may-2024

Dengue feber klinik



Dengue fever – classification after 2009



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

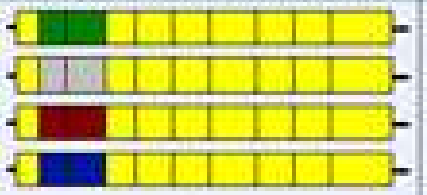
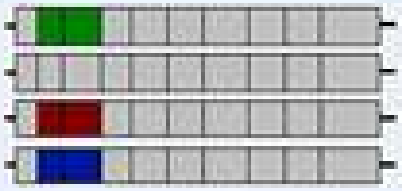
- Liver: AST or ALT >=1000
- CNS: Impaired consciousness
- Heart and other organs

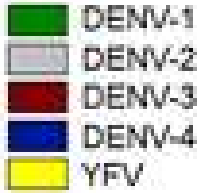
Dengue feber hos rejsende

- Hvad er risikoen for at få dengue feber?
  - Incidens per måned 0,1 - 0,3 %
  - Serokonvertering hos rejsende 1.0 - 6,7 %
  - 22 % indlagt og 32 % set ambulant under rejsen. 39 % i akutte fase under hjemrejse.
  - Dengue feber er den hyppigste årsag til feber hos hjemvendte rejsende.
- Hvad er risikoen for at få svær dengue?
  - Generelt 1-2 %
  - Ved sekundær infektion 2-4 %
  - Relativ risiko ved sekundær versus primær infektion = 2-7
  - Risiko for ADE først 2-3 år efter primær infektion
  - Seroprævalens hos rejsende ca. 4-6 %
- Risiko for at dø af dengue feber?
  - << 1%

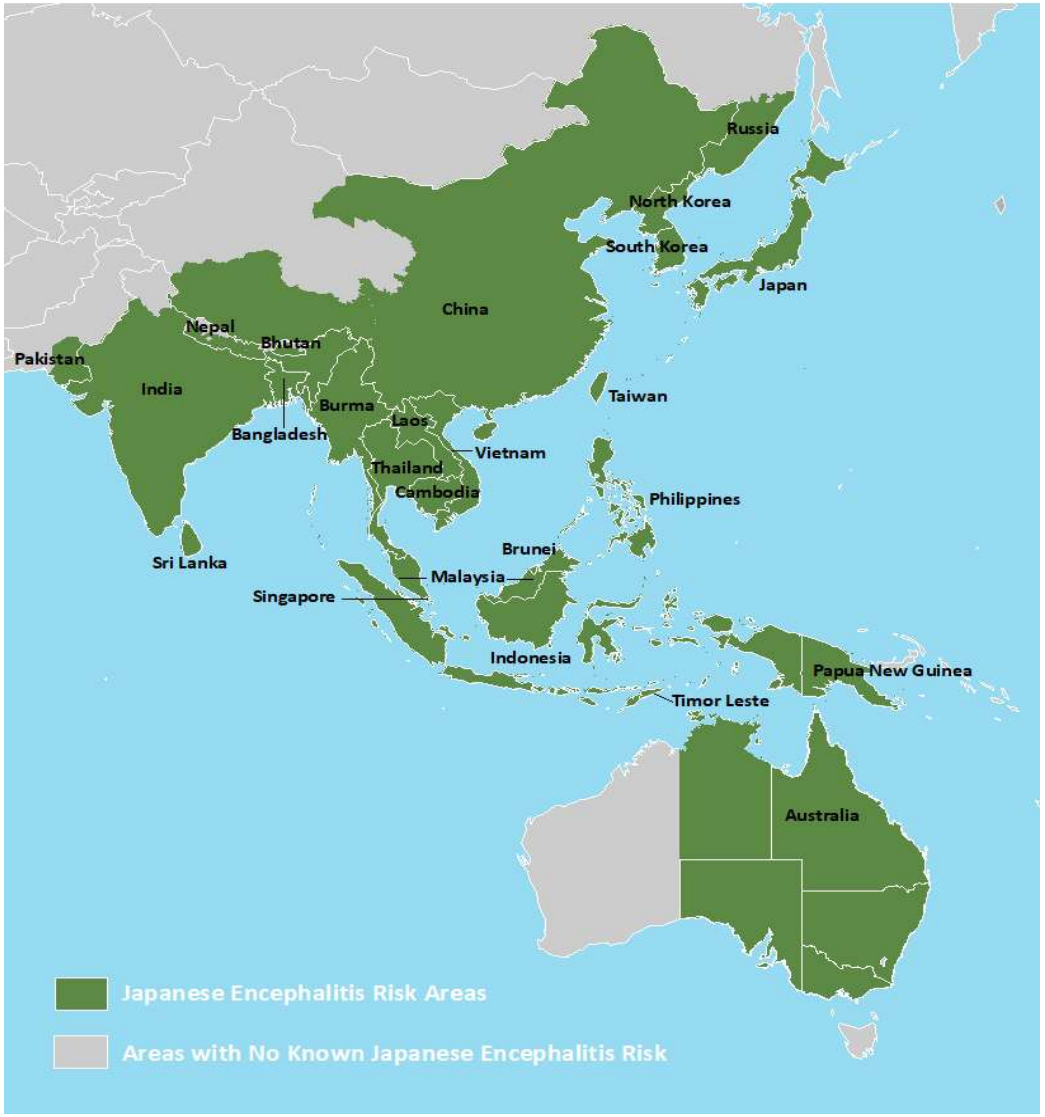
Halstead S: JTM 2019; Tozan Y: Am J Trop Med Hyg 2019; Olivero RM: Am J Trop Med Hyg 2016, Leder K: Ann Intern Med 2013, Ratnam L: Eur J Clin Microbiol Infect Dis 2012

Live attenuated dengue vaccines

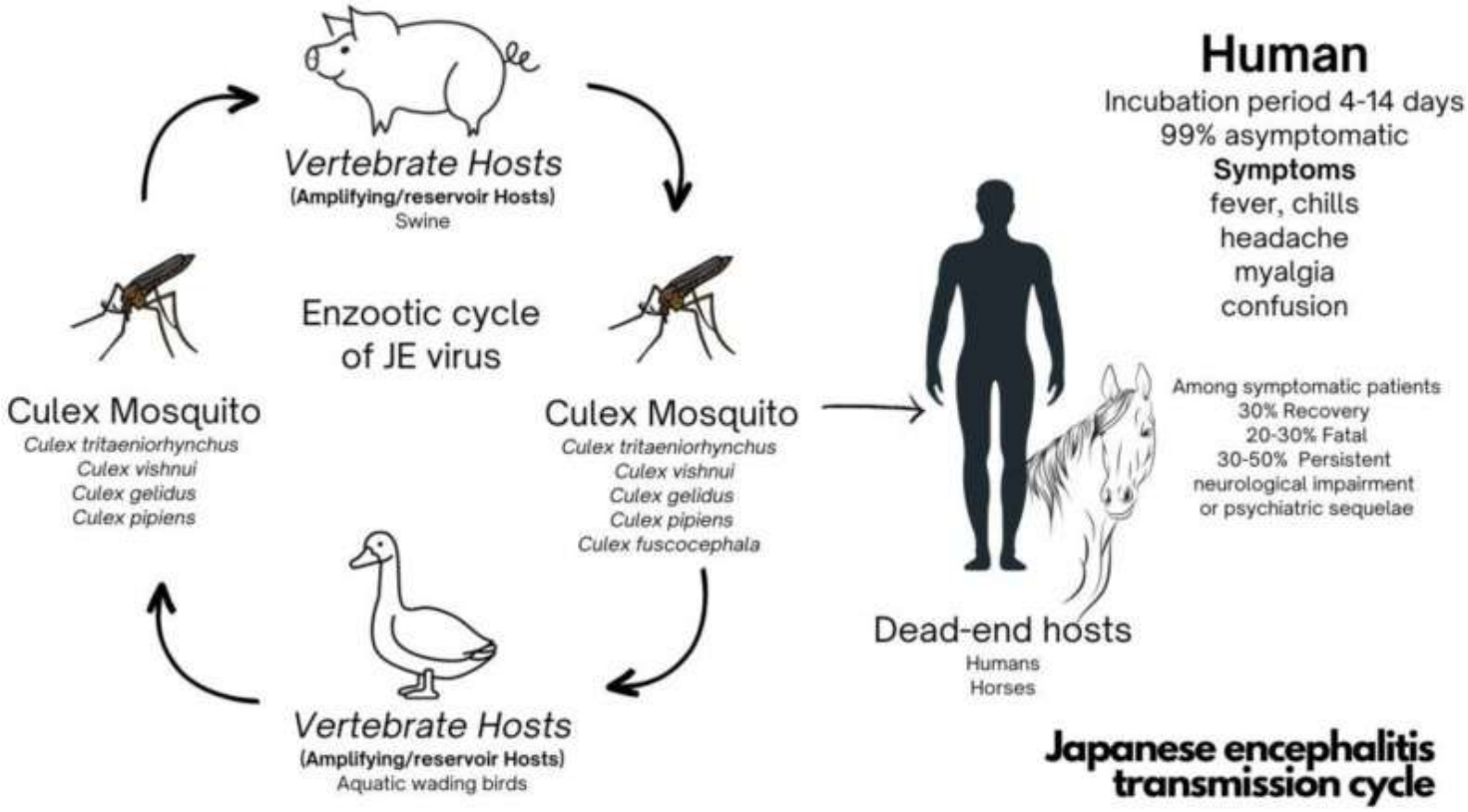
	Dengvaxia (Sanofi Pasteur)	TAK-003 (Takeda)	TV003 (NIH/Butantan)
Status	Licensed	Phase 3	Phase 3
# Doses	3 doses over 12 months (0, 6, 12)	2 doses (0, 3 months)	Single dose
Indicated age	9 - 45	Phase 3 age range 4 - 16	Phase 3 age range 2 - 59
Other	Requires documented previous DENV immunity	?	?
Construct			
Dengue proteins	8	16	32



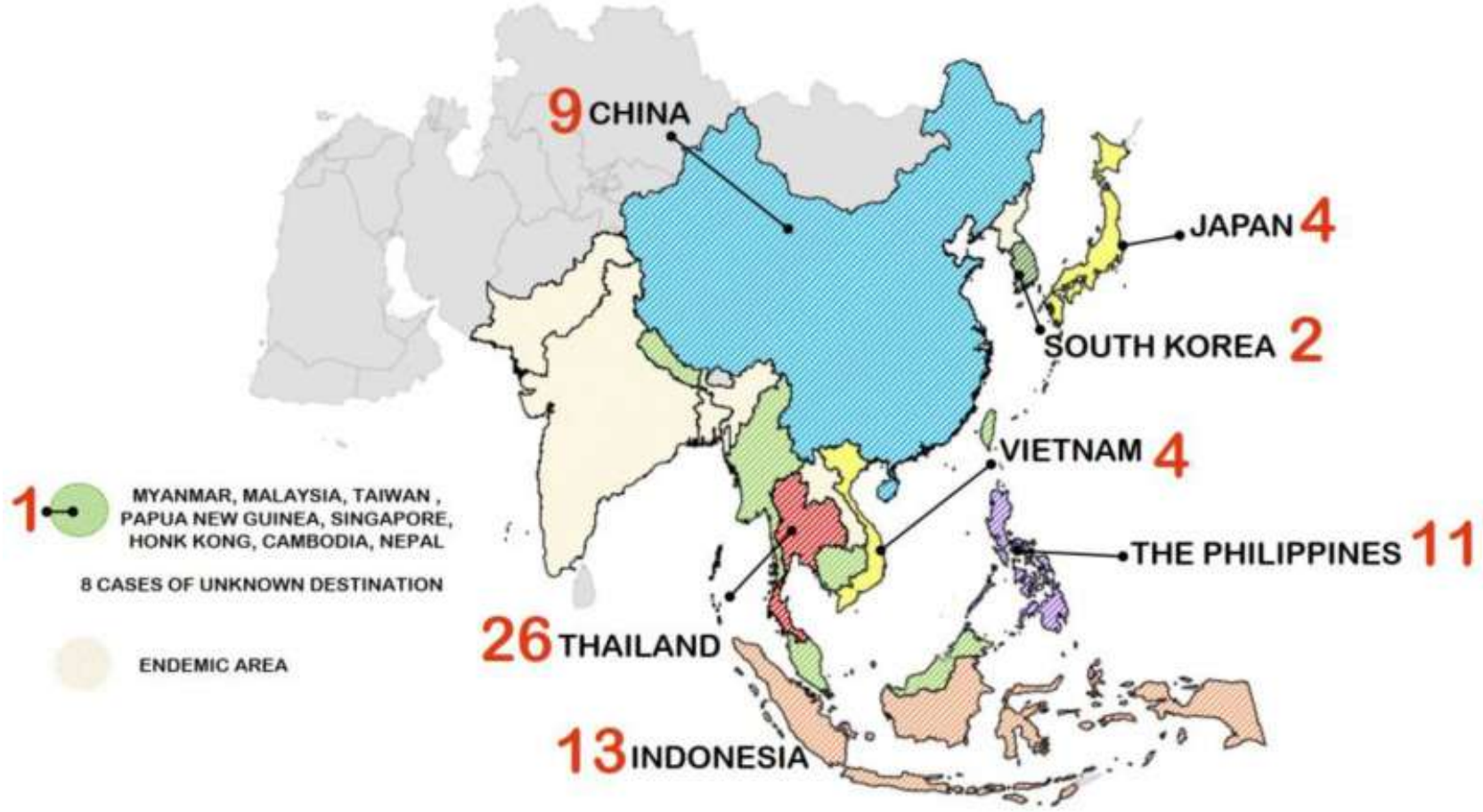
Japansk encephalitis



Japansk encephalitis



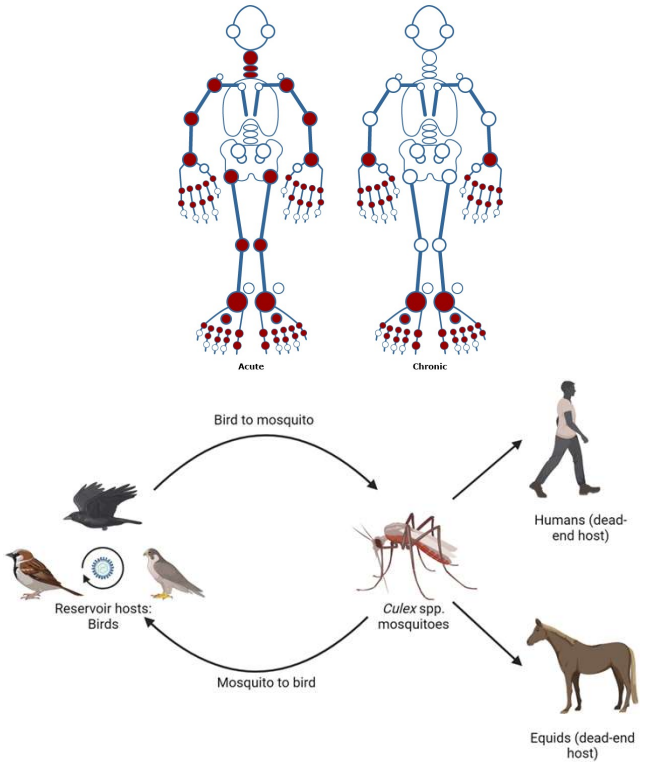
Cases of Japanese encephalitis among international travelers visiting JE-endemic countries, 1973–2023.



Between 1973 and 2020, 88 cases of JE among individuals from nonendemic countries were reported

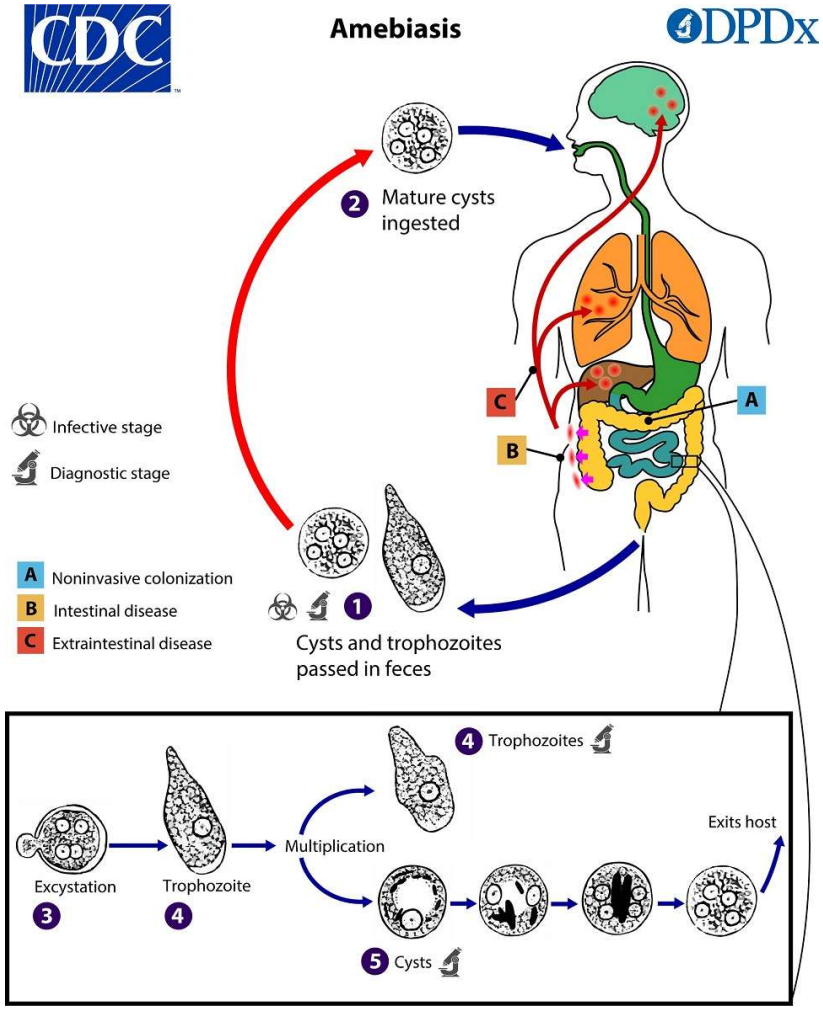
Andre arbovirus

- Zika
  - Kongenit zika syndrom
- Chikungunya
  - Langvarige ledsymptomer
  - Vacciner: Ixchiq, Vimkunya
- West Nile Fever
  - Hjernebetændelse

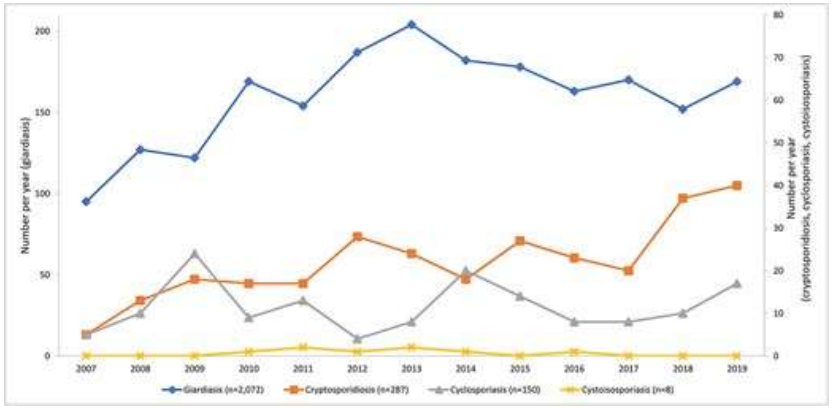


Amoebiasis

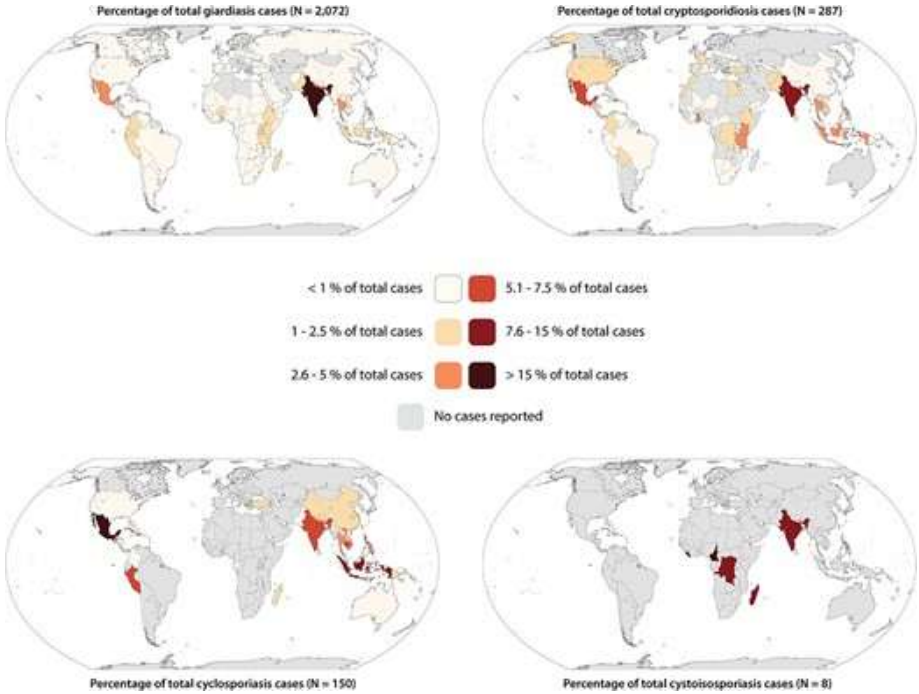
- Behandling
  - Trofozoitter:
    - Metronidazol
  - Cyster:
    - Paromomycin (Humatin)
    - Diloxanide furoate (Furamide)



Intestinal protozoa in returning travellers: a GeoSentinel analysis from 2007 to 2019



	Giardiasis (n = 2,072)	Cryptosporidiosis (n = 287)	Cyclosporiasis (n = 150)	Cystoisosporiasis (n = 8)
South Central Asia	45,8	19,5	12,7	12,5
Sub-Saharan Africa	22,6	24,7	2,7	62,5
South America	8,7	6,3	8	0
South East Asia	7,7	13,6	31,3	0
Central America	5,3	12,2	27,3	0
Middle East	2,2	3,1	1,3	0
North Africa	2,2	3,8	0	0
Caribbean	2	7,3	10	25
Western Europe	1,5	5,2	0	0
North East Asia	0,8	0,7	4	0
Eastern Europe	0,5	1,4	0	0
North America	0,4	1,1	0,7	0
Oceania	0,2	1,1	1,3	0
Australia/New Zealand	0,1	0	0,7	0



Journal of Travel Medicine, 2024, taae010

Table 1.

Epidemiologic features of rickettsial diseases

Disease	Organism	Group	Distribution	Vector	Severity
Rocky Mountain spotted fever	*R. rickettsii*	Spotted fever	Americas	Tick	+++++
Mediterranean spotted fever	*R. conorii*	Spotted fever	Europe, Africa, Asia	Tick	+++
Siberian tick typhus	*R. sibirica*	Spotted fever	Eurasia, Africa	Tick	++
Japanese spotted fever	*R. japonica*	Spotted fever	Japan, eastern Asia	Tick	++
Flinders Island spotted fever	*R. honei*	Spotted fever	Australia, Asia	Tick	++
Far Eastern spotted fever	*R. heilongjiangensis*	Spotted fever	Eastern Asia	Tick	++
African tick bite fever	*R. africae*	Spotted fever	Sub-Saharan Africa, Caribbean islands	Tick	++
Maculatum disease	*R. parkeri*	Spotted fever	Americas	Tick	++
Tick-borne lymphadenopathy	*R. slovaca*	Spotted fever	Europe, Asia	Tick	+
Tick-borne lymphadenopathy	*R. raoultii*	Spotted fever	Europe, Asia	Tick	+
Unnamed	*R. massiliae*	Spotted fever	South America, Europe	Tick	+*
Pacific Coast tick fever	*Candidatus* R. philippii	Spotted fever	United States	Tick	+*
Unnamed	*R. aeschlimannii*	Spotted fever	Europe, Africa	Tick	+*
Unnamed	*R. monacensis*	Spotted fever	Europe	Tick	+*
Unnamed	*R. helvetica*	Spotted fever	Europe	Tick	+*†
Asymptomatic or mild illness with seroconversion	*R. amblyommatis*	Spotted fever	Americas	Tick	+/−†
Typhus	*R. prowazekii*	Typhus	South America, Africa, Eurasia	Body louse, Ectoparasites of flying squirrels	++++
Murine typhus	*R. typhi*	Typhus	Worldwide	Flea	+++
Rickettsialpox	*R. akari*	Transitional	North America, Eurasia	Mouse mite	++
Queensland tick typhus	*R. australis*	Transitional	Eastern Australia	Tick	++
Flea borne spotted fever	*R. felis*	Transitional	Worldwide	Flea	+

*Clinical data based on a limited number of patients reported in the literature.

†Implicated as a cause of subclinical infection with subsequent seroconversion.

Treatment of rickettsial diseases.

	Medication	Adult dose	Pediatric dose	Duration
First choice for RMSF and all other rickettsioses	Doxycycline oral or intravenous	100 mg twice daily	2.2 mg/kg (max 100 mg) twice daily	≥3 days after defervescence (minimum 5 – 7 day course)
Alternative for RMSF and all other rickettsioses *	Chloramphenicol oral or intravenous	500 mg every 6 hours	12.5 mg/kg every 6 hours	≥3 days after defervescence (minimum 5 – 7 day course)
Alternative for MSF and other less severe SFG rickettsioses	Oral fluoroquinolones: • Ciprofloxacin • Levofloxacin Oral macrolides: • Clarithromycin • Azithromycin	• 500 mg twice daily • 500 mg daily • 500 mg twice daily • 500 mg daily	• Not recommended • Not recommended • 7.5 mg/kg twice daily • 10 mg/kg daily	5 – 7 days • 7 days • 3 days
		• 500 mg X 1 then 250 mg daily	• 10 mg/kg X 1 then 5 mg/kg daily	• 5 days
Alternative for epidemic louse-borne typhus †	• Short course oral doxycycline	• 200 mg once		
Alternative for murine typhus	Oral fluoroquinolones: • Ciprofloxacin Levofloxacin	• 500 mg twice daily • 500 mg daily	• Not recommended • Not recommended	5 – 7 days

* Chloramphenicol is inferior to doxycycline for RMSF. Its oral form is not available in the U.S., and the parenteral form is difficult to procure.

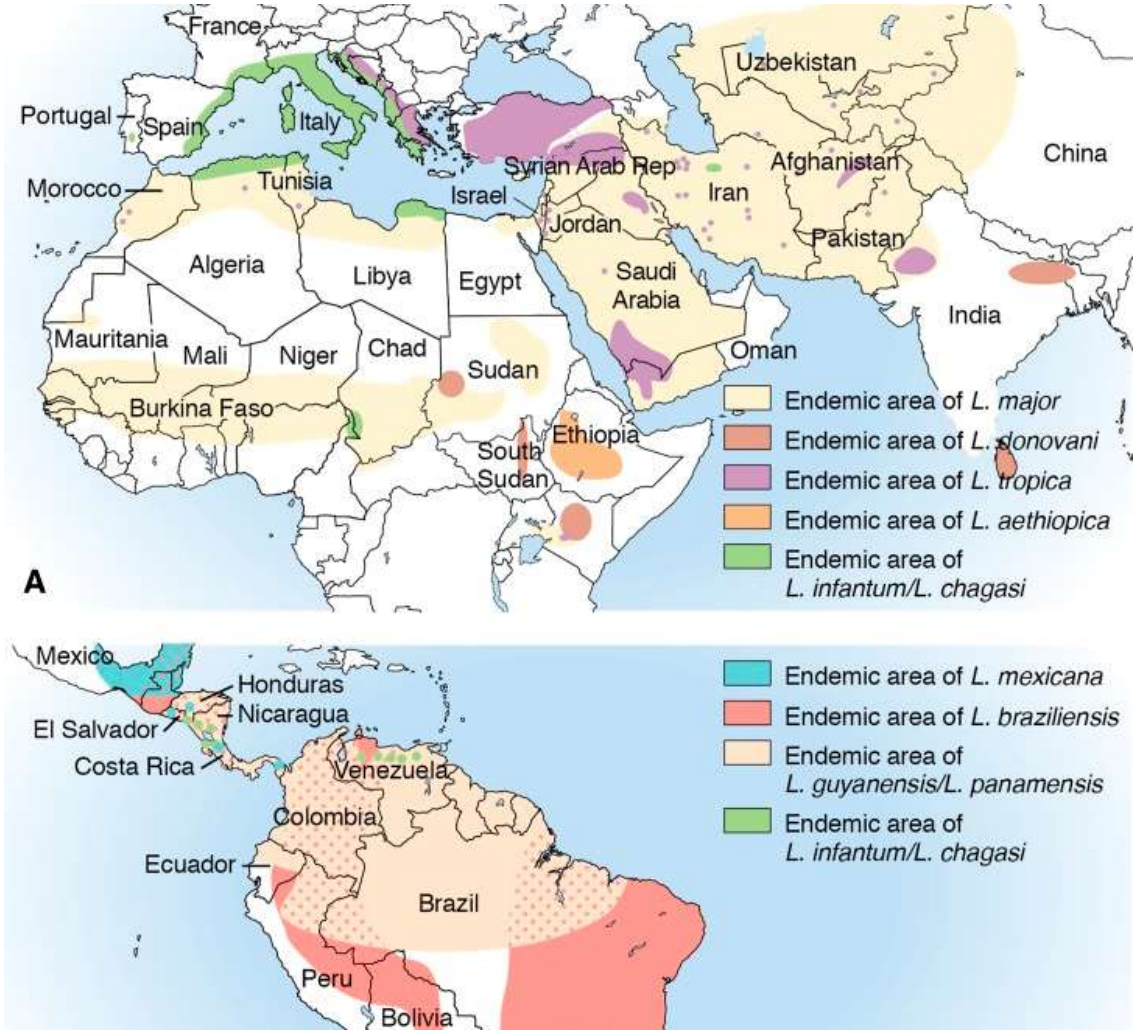
† Only recommended if needed for mass treatment during an outbreak (relapses have been documented).

Sygehistorie

- 26 årig rask kvinde har været på to ugers backpackertur i den sydlige del af Mexico i januar 2019.
- Hun har fået flere mygge-/insektstik.
- Har badet i havet, søer og grotte.
- Har udviklet et kronisk sår på venstre overarm.
- Der er dyrket få MSSA, men ingen effekt af dicillin.
- Hvad fejler hun?
- Hudbiopsi positiv for *Leishmania mexicana* ved PCR

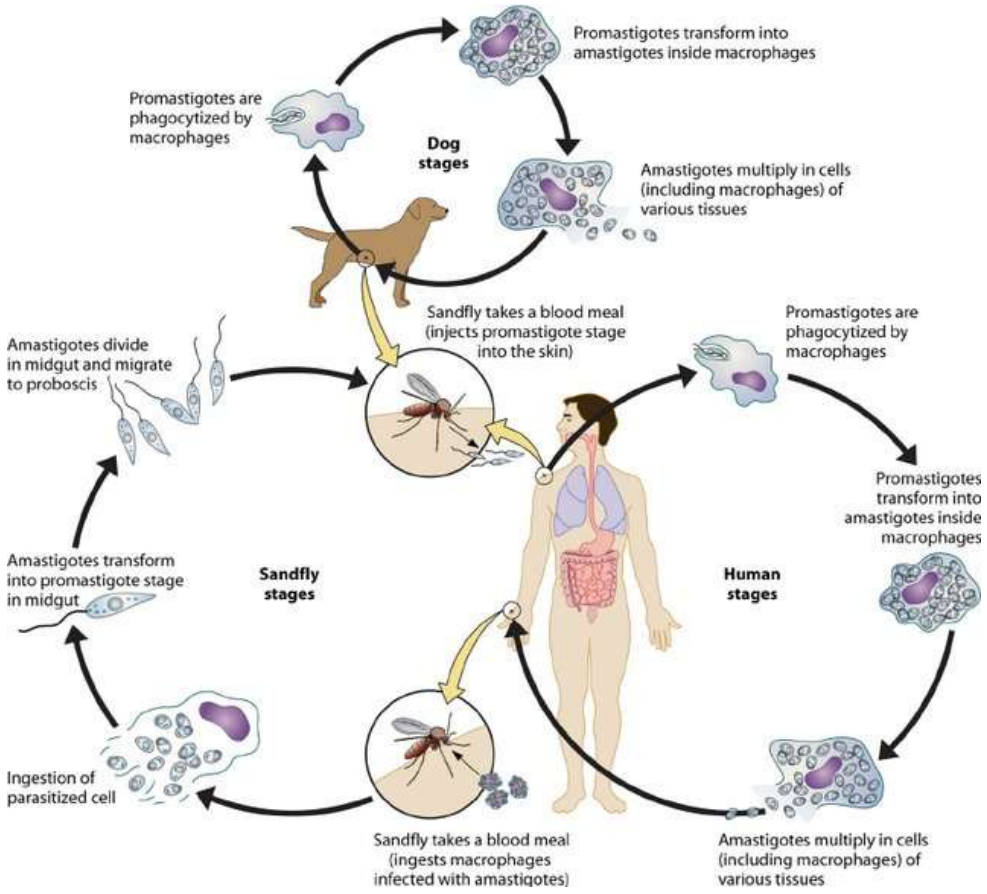



Kutan leishmaniasis geografisk udbredning



Leishmanisis

- Ætiologi: Leishmania spp.
- Vektor: Sandfluer
- Klinik
  - Kutan leishmaniasis (CL)
  - Mucokutan leishmaniasis (ML)
  - Visceral leishmaniasis (Kala Azar) (VL)
- Diagnostik
  - Hudbiopsi (CL)
    - Direkte mikroskopi
    - PCR
    - (Dyrkning)
  - Serologi (Anbefales ikke ved CL)
- Behandling afhængig af
  - Leishmania species
  - Antal, størrelse og lokalisering af læsioner



Vektor: Sandfluer

Old World

Phlebotomus

New World

Lutzomyia

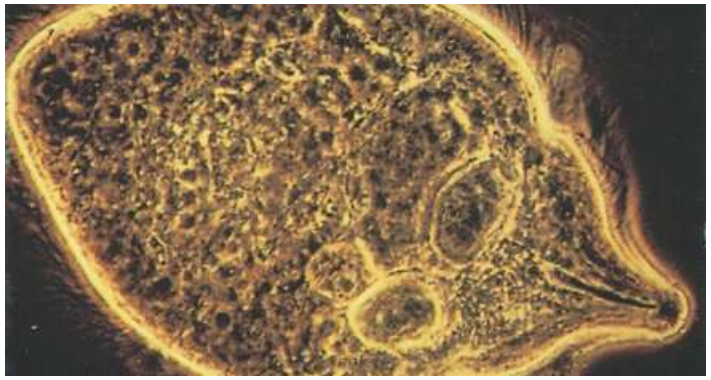
”These insects are weak fliers, mostly active during the night and only when there is little or no wind.”

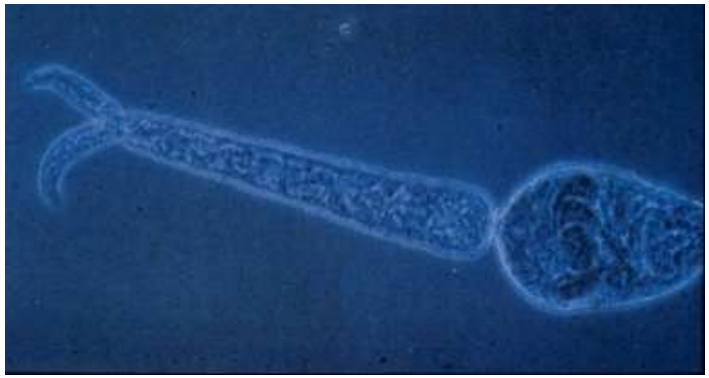
Obs! Azoler

Table 1 Chemotherapeutic agents for leishmaniasis.

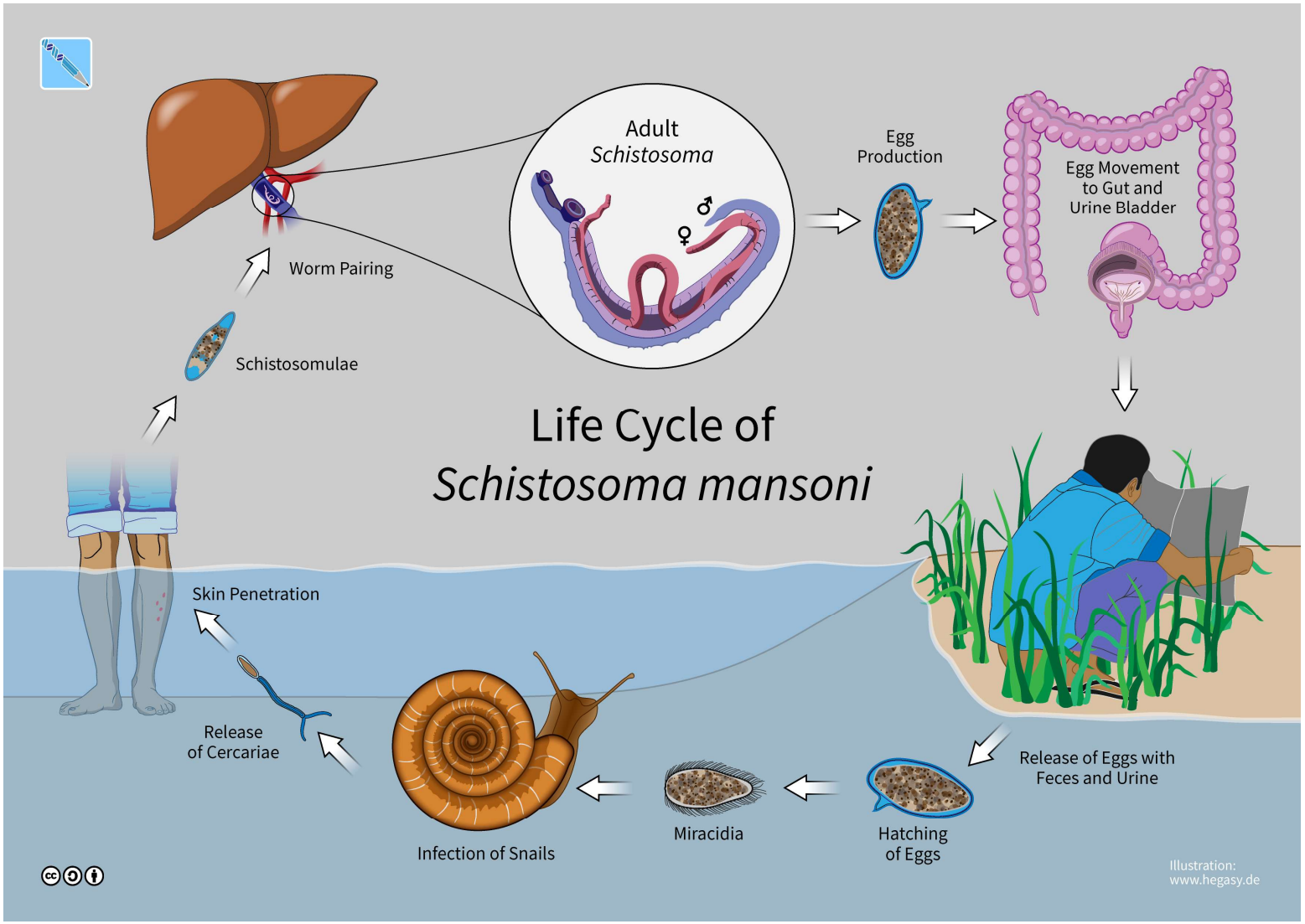
Drug	Route of administration	Dose	AEs	Advantages	Disadvantages
Pentavalent antimonial	IM, IV or IL	20 mg/kg/day for 28–30 days	Cardiotoxicity, pancreatitis; nephrotoxicity; hepatotoxicity	Easy availability (in endemic areas); low cost	Prolonged treatment duration; pain during injection, toxic AEs; drug resistance
Amphotericin B	IV	0.75–1 mg/kg/day for 15–20 days, daily or alternate daily	Renal toxicity; injection-related reactions; hypokalaemia	Primary resistance is not common;	Requires hospitalization for administration; nephrotoxicity; heat; instability
Liposomal amphotericin B	IV	10–30 mg/kg total dose (single dose; 3–5 mg/kg/dose)	Chills and rigors during injection; mild nephrotoxicity	High efficacy; low toxicity	High cost; need for slow IV infusion
Miltefosine	Oral	100–150 mg/day for 28 days	GI AEs; renal and liver toxicity; teratogenicity	Effective	High cost; possibly teratogenic; drug resistance; poor compliance
Paromomycin	IM (VL) or topical (CL)	15 mg/day for 21 days or 20 mg/kg for 17 days	Renal, ear and liver toxicity	Effective; relatively cheap	Varied efficacy according to geographical area; potential for resistance
Pentamidine	IM	3 mg/kg/day IM alternate daily for 4 injections	Hyperglycaemia; hypotension; tachycardia; electrocardiographic changes	Short course needed	Varied efficacy depending on *Leishmania* species

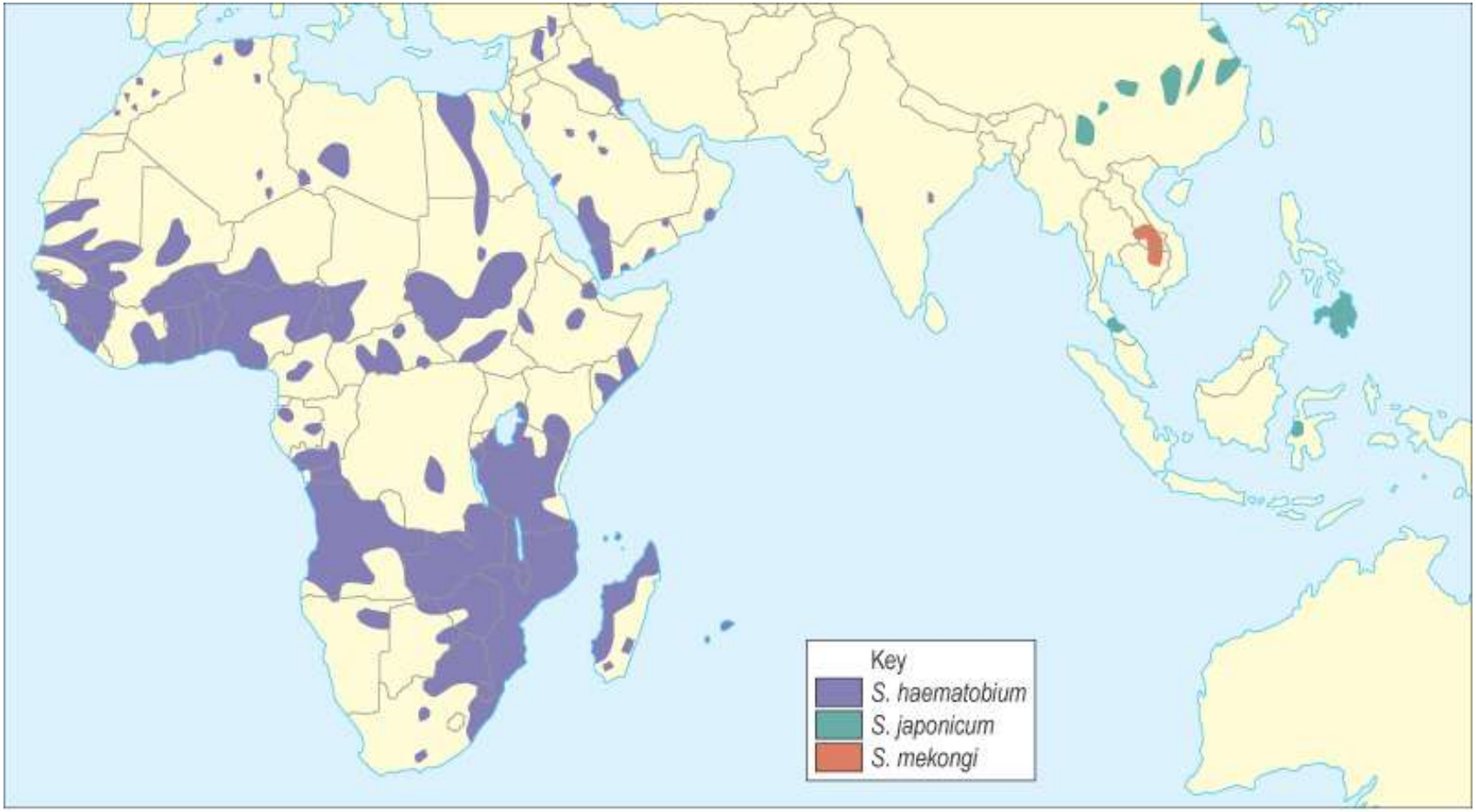
AD, adverse effect; CL, cutaneous leishmaniasis; GI, gastrointestinal; IL, intralesional; IM, intramuscular; IV, intravenous; VL, visceral leishmaniasis.

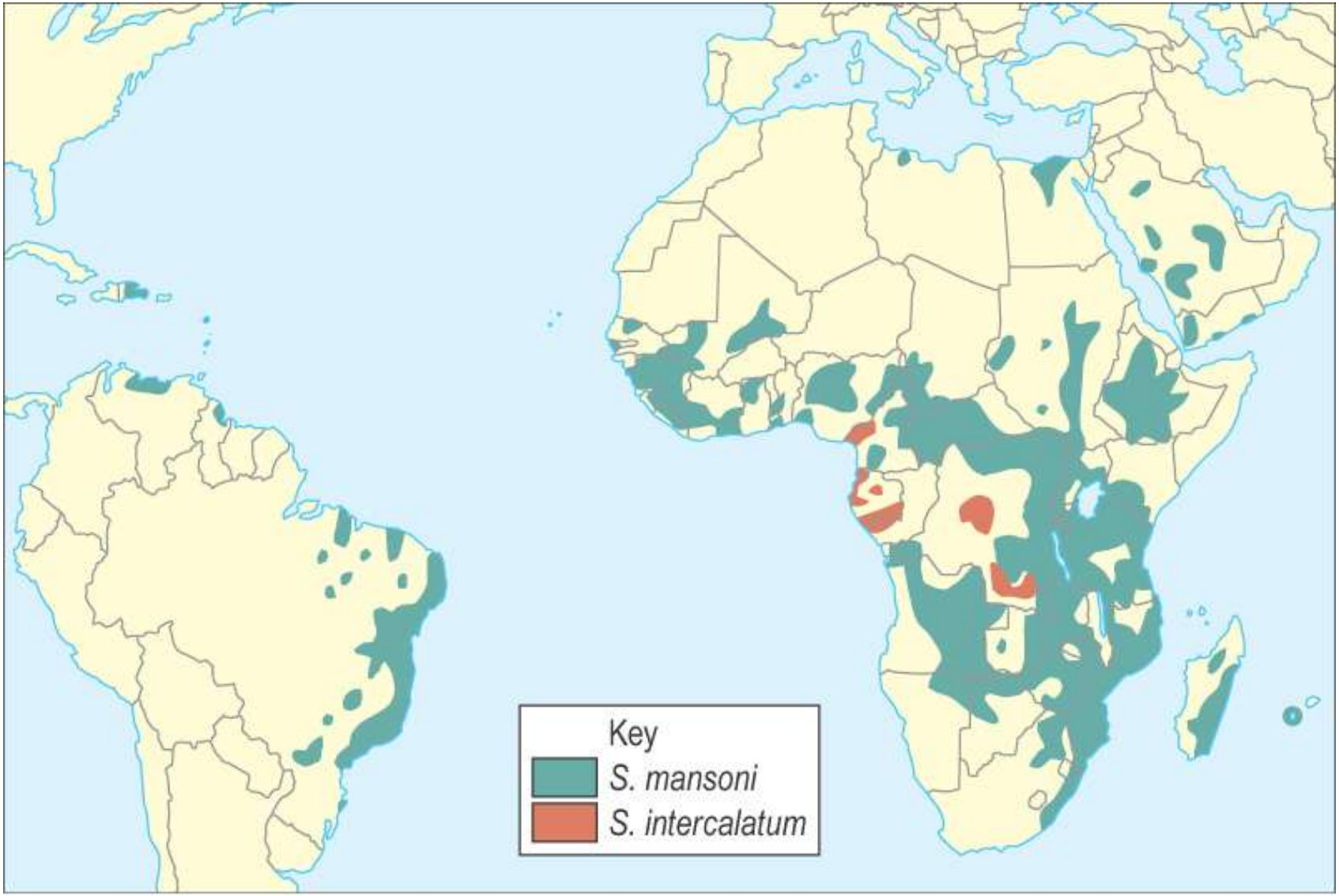




Schistosomiasis


Adult
Schistosoma
♂
♀
Egg
Production
Egg Movement
to Gut and
Urine Bladder
Worm Pairing
Schistosomulae
Life Cycle of
Schistosoma mansoni
Skin Penetration
Release
of Cercariae
Infection of Snails
Miracidia
Hatching
of Eggs
Release of Eggs with
Feces and Urine
Illustration:
www.hegasy.de





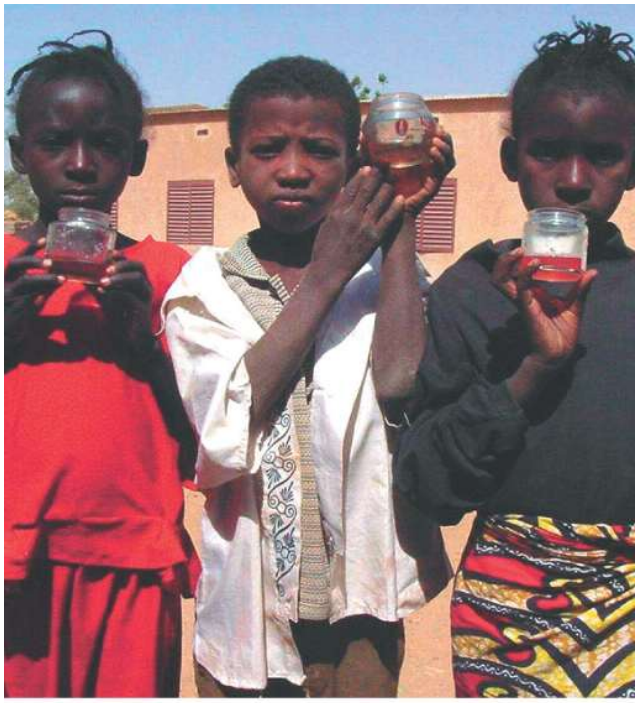
Cerkaria dermatitis

Peters and Pasvol: Atlas of Tropical Medicine and Parasitology 6th edition © 2006 Elsevier Ltd

Katayama feber

- Inkubationstid: 4-6 uger (2-9 uger)
- Symptomer: feber, træthed, myalgier, artralgier, hoste, hvæsen, hovedpine, urticaria, diarré og hepatosplenomegali
- Undersøgelser:
  - Stort set alle har eosinofili
  - Kun få har positiv serologi (seroconversion 1,6 mdr) eller udskiller æg
- Behandling:
  - Praziquantel 40 mg/kg fordelt på 2 doser
  - Prednisolon 20 mg dgl i 5 dage

Kronisk schistosomiasis



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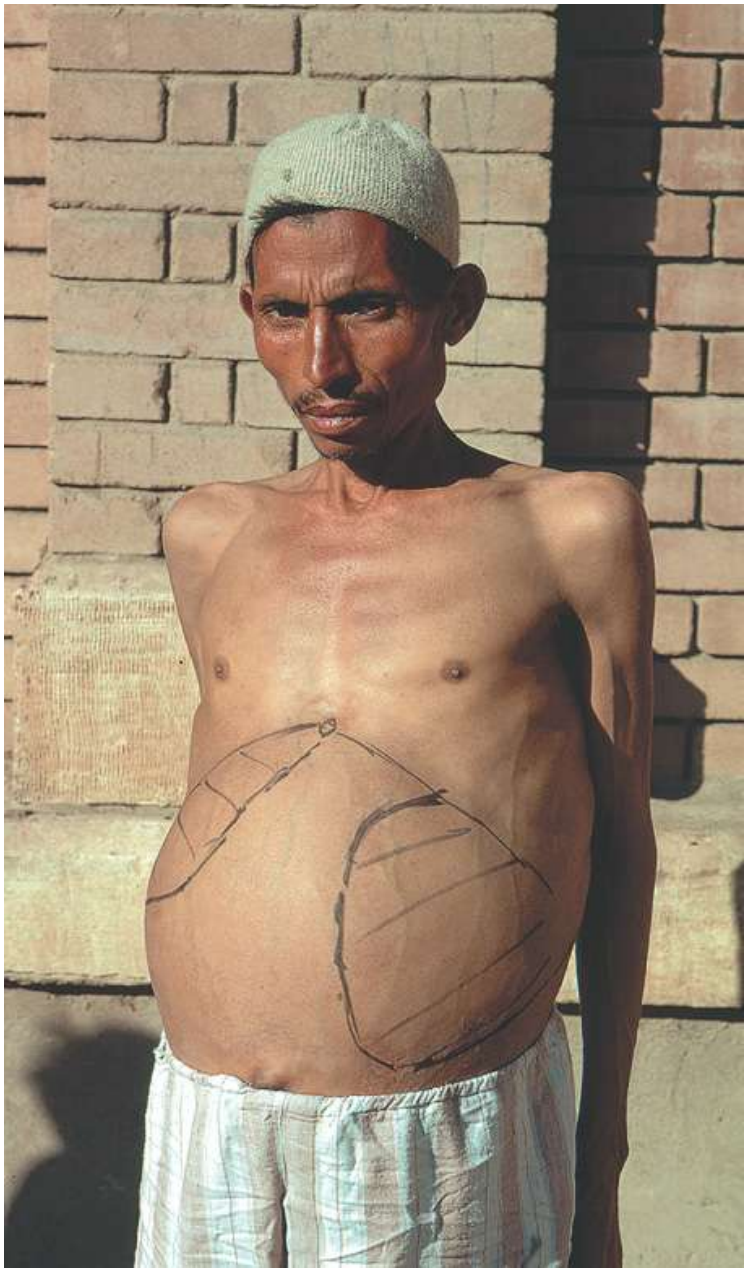


Diagnostik og behandling

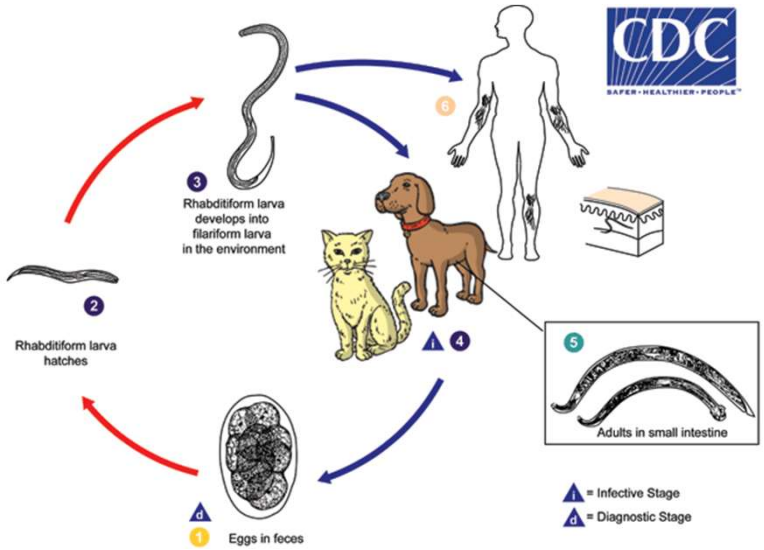
Rejsende

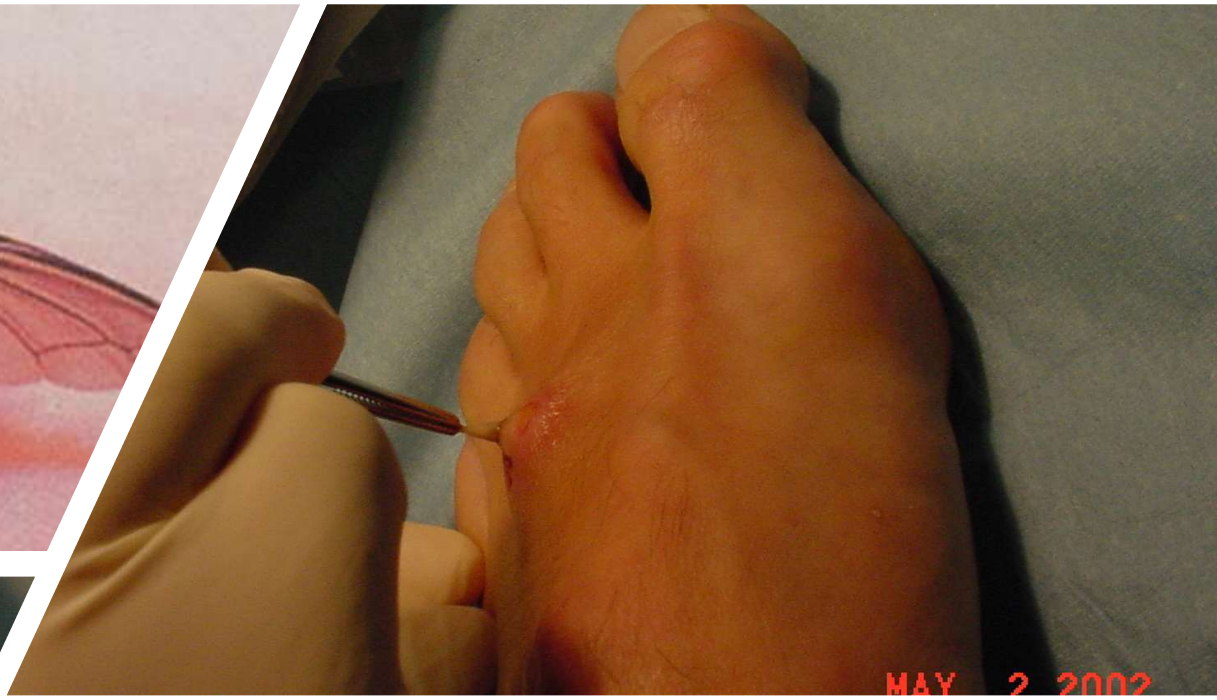
Stadium	Symptomer	Diagnostik			Behandling
		Eosinofili	Antistoffer	Æg: urin/fæces	
Cerkaria dermatitis	+	-	-	-	1% Hydrocortisone Antihistamin
Katayama feber	++	++	(+)	(+)	Antihistamine Prednisolone Praziquantel x 2
Kronisk bilharziose	(+)	(+)	+	(+)	Praziquantel x 2

Larva cutanea migrans

Kutan larva migrans

- Ætiologi: *Ancylostoma* spp.
- Smittevej: direkte hudkontakt med sand/jord
- Inkubationstid: 1-5 dage (over en måned)
- Klinisk diagnose
- Behandling
  - Førstevalg er tbl. ivermectin 200 µg/kg som engangsdosis,
  - Alternativt tbl. albendazol 400 mg × 1 i 3 dage.
- Forebyggelse
  - Fodtøj
  - Liggeunderlag

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