



# Approach to fever in the tropics and travelers

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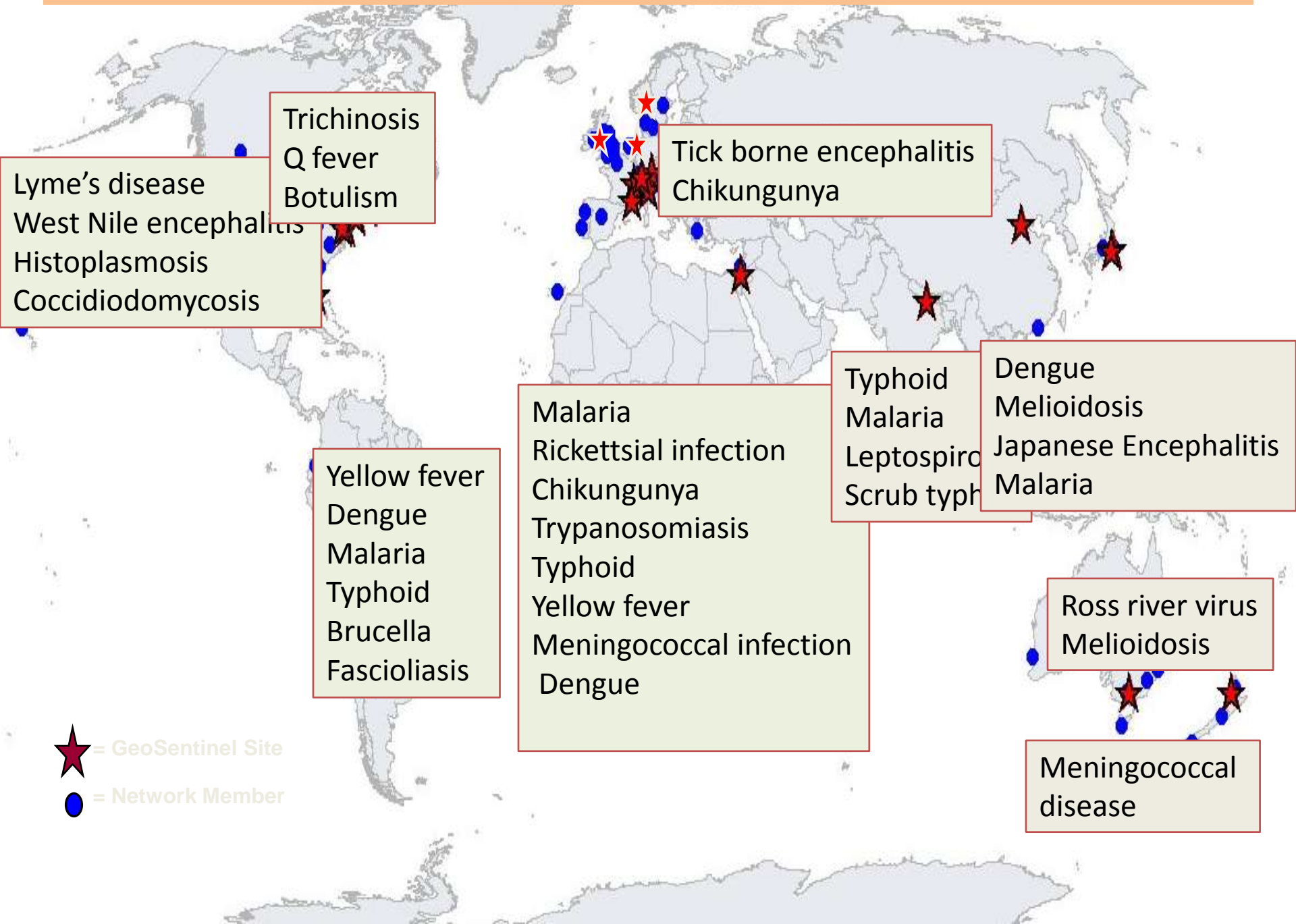
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EACH REGION OF THE WORLD HAS ITS OWN SPECIFIC DISEASES NOT LIMITED TO TROPICS

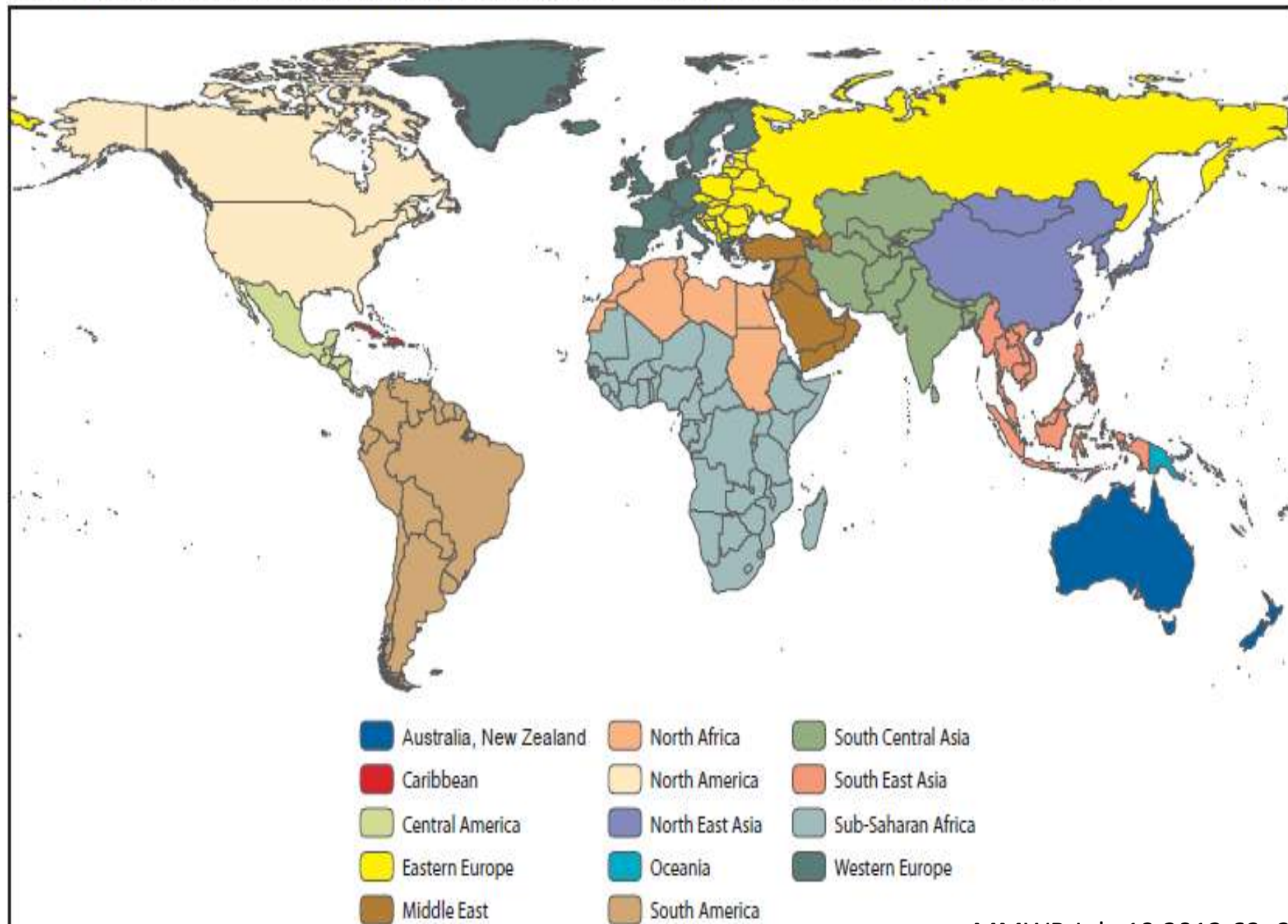


★ = GeoSentinel Site  
 ● = Network Member

# Airline connections



FIGURE 2. Geographic region\* of exposure for after-travel patients — GeoSentinel Surveillance System, worldwide, 2011



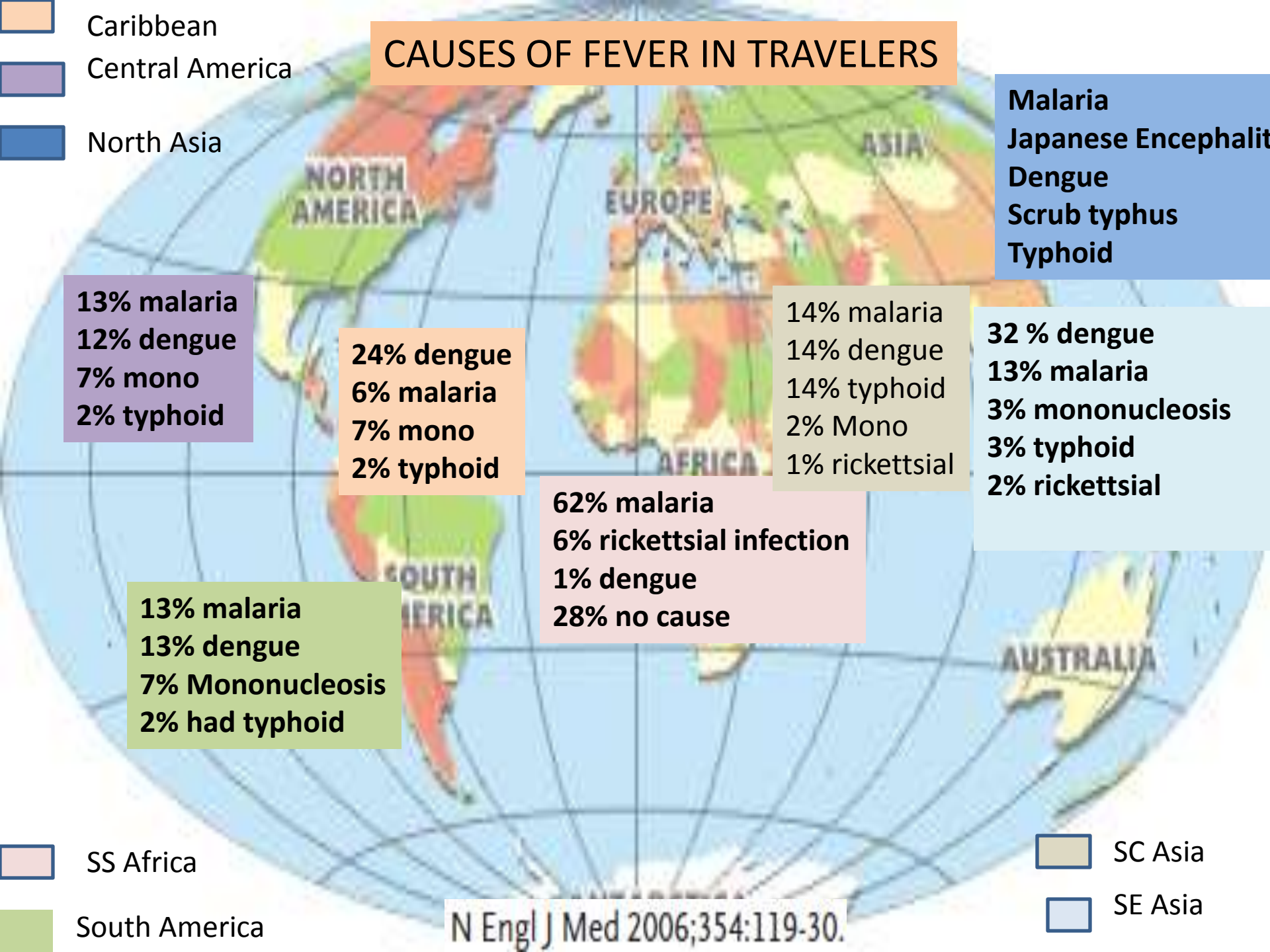
# Tropical fevers vs Fever in travelers

- Each area of the world is unique and endemic for specific tropical diseases
- Large amount of data about causes of fever in travelers
- Hardly any data regarding causes of fever in the tropics
- Studies available use inconsistent definitions of AUFI and diagnoses are not often confirmed
- Travelers used as sentinels to reflect what is happening in the tropics

To diagnose fever **from** the tropics you need to know fever **in** the tropics



# CAUSES OF FEVER IN TRAVELERS



**Malaria**  
**Japanese Encephalitis**  
**Dengue**  
**Scrub typhus**  
**Typhoid**

**13% malaria**  
**12% dengue**  
**7% mono**  
**2% typhoid**

**24% dengue**  
**6% malaria**  
**7% mono**  
**2% typhoid**

**14% malaria**  
**14% dengue**  
**14% typhoid**  
**2% Mono**  
**1% rickettsial**

**32 % dengue**  
**13% malaria**  
**3% mononucleosis**  
**3% typhoid**  
**2% rickettsial**

**62% malaria**  
**6% rickettsial infection**  
**1% dengue**  
**28% no cause**

**13% malaria**  
**13% dengue**  
**7% Mononucleosis**  
**2% had typhoid**

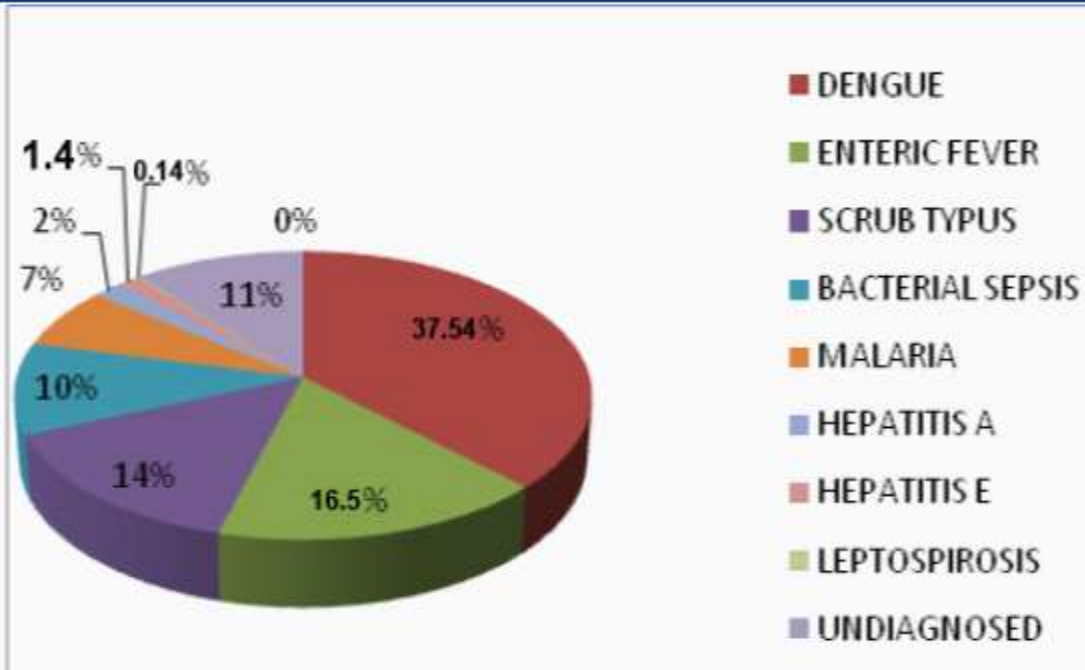
**SS Africa**  
**South America**

**SC Asia**  
**SE Asia**

# Fever IN the tropics

- Often syndromic
- Without diagnostics, most often etiology guessed
- Common diseases vastly overdiagnosed
  - Africa: malaria
  - Asia: enteric fever
- **The advent of RDT for malaria has led to recognition of other important causes of acute undifferentiated febrile illnesses in the tropics**
- Antimicrobial resistance problematic everywhere

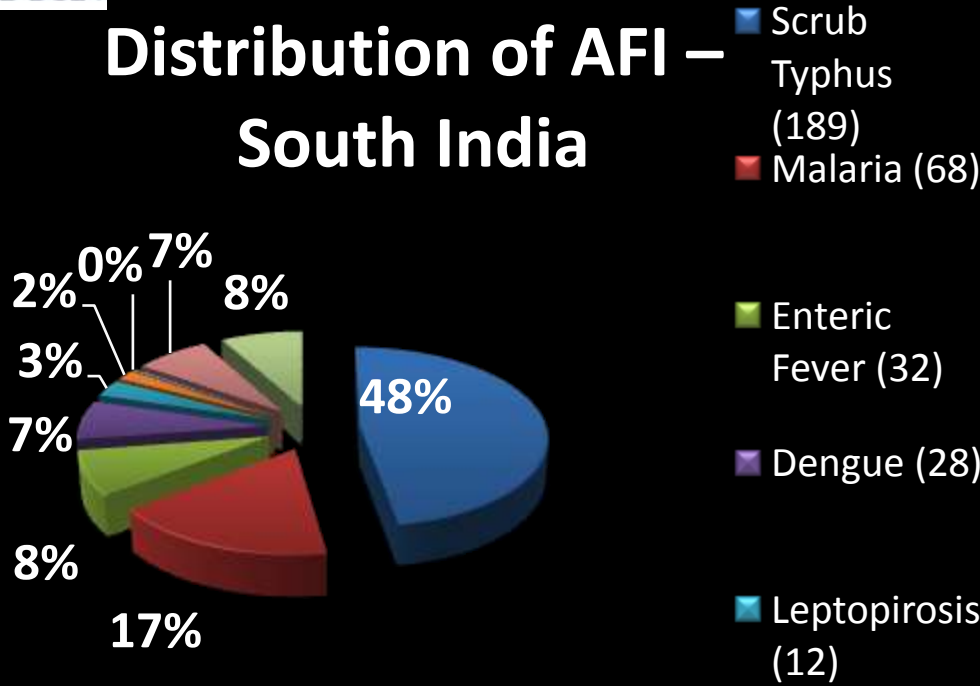




Journal of Clinical and Diagnostic Research. 2015 Dec, Vol-9(12): DC22-DC24



## Distribution of AFI – South India



Trop Doctor.2010;40(4):230-34.

# Etiology of febrile illness in Nepal

- Between Jan-March and then July-August 2001
- 876 patients (370 winter and 506 in monsoon) were recruited if they had fever more than 24 hours
- Enteric fever was the admission diagnosis in 40% patients whereas it was actually confirmed in only 13.3% patients

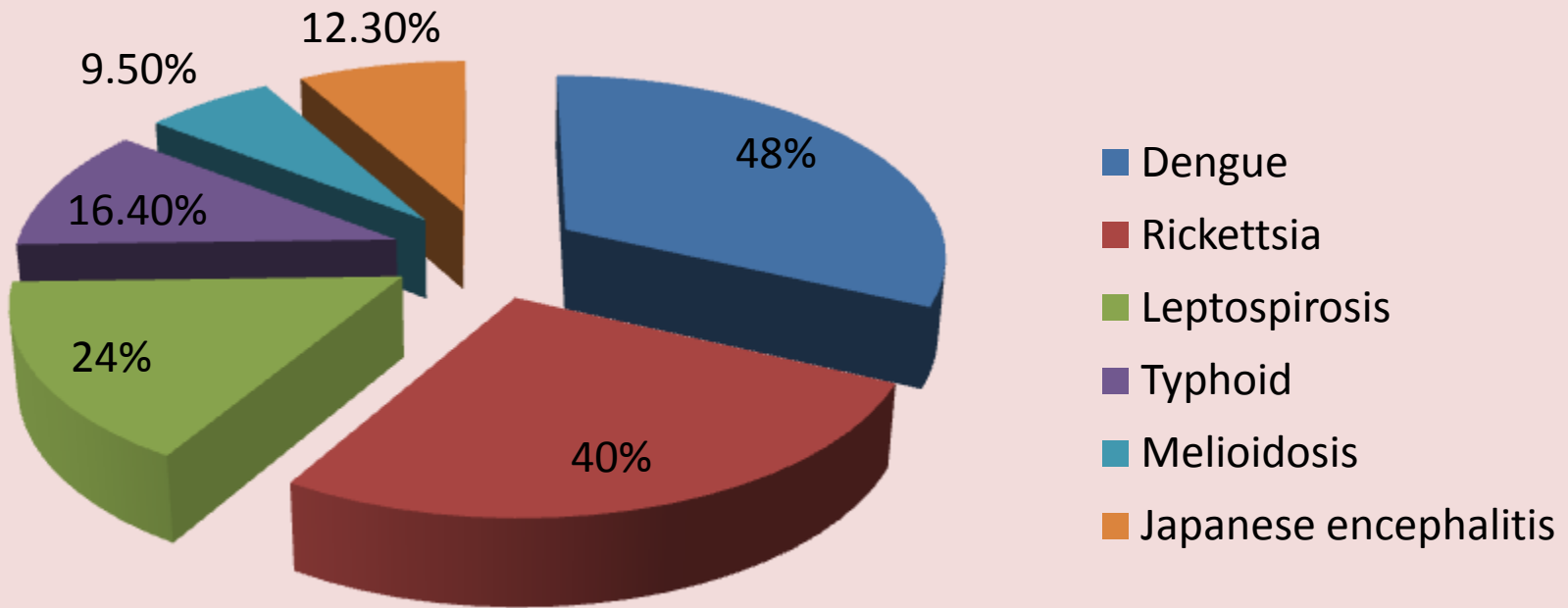
Diagnostic test results from patients presenting with fever to an urban hospital in Nepal\*

Pathogen	Winter	Summer
Blood		
<i>Sab</i> Typhoid	- 13.3%	
<i>Sab</i>		
<i>P</i> Murine typhus	- 11%	
<i>Esc</i>		
<i>Staj</i>		
<i>Stre</i> Leptospirosis	- 4%	
<i>Nei</i>		
<i>Ent</i> Scrub typhus	- 3%	
Urina		
<i>Stre</i> Pneumonia	- 6%	
<i>Leg</i>		
Serolo		
<i>Rickettsia typhi</i>	32 (9%)	65 (13%)
<i>Orientia tsutsugamushi</i>	12 (3%)	16 (3%)
<i>Leptospira</i> species	9 (2%)	27 (5%)
Dengue virus	0 (0%)	0 (0%)
HIV	6 (2%)	5 (1%)





## Fever in Southeast Asia





Febrile		
Total (N = 370)		
Pathogens present	Number/tested	%
Malaria†	14/268	5.2%
GAS	8/354	2.3%
Influenza A/B	58/286	20.3%*
RSV	15/284	5.3%
PIV1/2/3	29/286	10.1%*
Adenovirus	30/286	10.5%
hMPV	9/286	3.2%
Coinfected‡	22/269	8.2%
Other/unknown§	102/275	37.1%*

*Am. J. Trop. Med. Hyg.*, 92(5), 2015, pp. 1030–1037

In an area of high malaria hosp admissions were due to

- Malaria

- HIV
- Mycobacterial infections
- Bacterial infections

Admission diagnosis was malaria in 74% but was confirmed only 20.2%

Bacteremia in 13.1% but antibiotic prescribed in 52%

Malaria 28.8%

Dengue – 0.4%

# Acute undifferentiated Febrile Illness



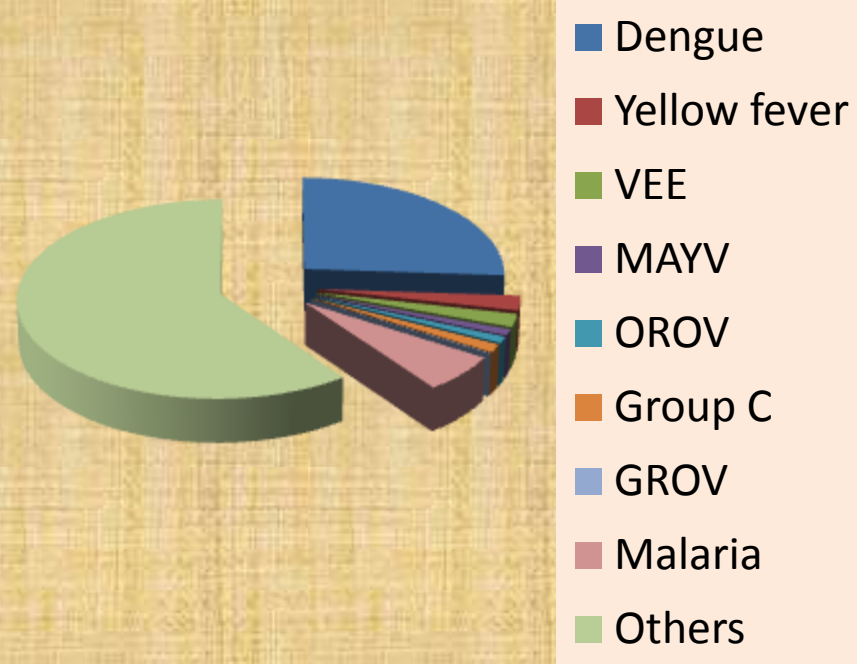
- Dengue 37.3%
- Leptospirosis 14.1%
- Rickettsioses 2.7%
- Arenavirus 2.5%

[Biomedica](#). 2013 Sep;33 Suppl 1:99-107.

- Hantavirus
- Rubella
- West Nile virus
- Mayaro



## Arboviruses causing AFI



PLoS Negl Trop Dis 4(8): e787. doi:10.1371/journal.pntd.0000787

Arboviruses causing AFI : Dengue, Venezuelan equine encephalitis, Oropouche, Mayaro, Group C, Guaraoia, Yellow fever

# Approach to acute undifferentiated febrile illness

## Acute febrile illness

### < 2 weeks

- Malaria
- Dengue
- Typhoid
- Scrub Typhus
- Leptospirosis
- Chikungunya
- Spotted fever

## Largely syndromic

- Fever, abdominal pain and jaundice
- Fever with rash
- Fever, headache and vomiting
- Fever with splenomegaly
- Fever, jaundice and altered sensorium

MOST OFTEN LABS ARE SUPPORTIVE RATHER THAN CONFIRMATORY

# Differential diagnoses

## Fever with rash

- Rubeola, rubella, viral exanthems, HIV, dengue
- Meningococemia, typhoid, leptospirosis
- Scrub typhus, spotted fevers
- Drugs
- SLE, rheumatic fever

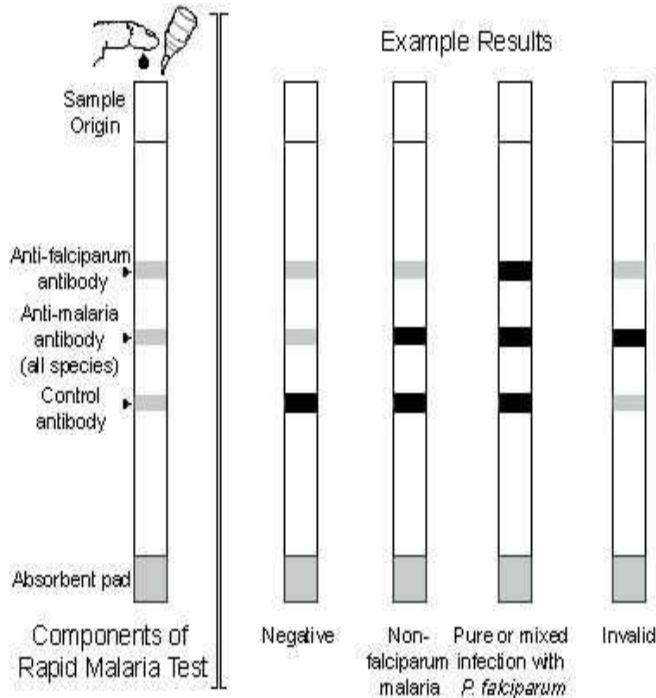
## Fever and jaundice

- Malaria
- Leptospirosis
- Viral hepatitis
- Typhoid
- Scrub typhus
- Spotted fevers
- Cholecystitis, Cholangitis,
- Liver abscess



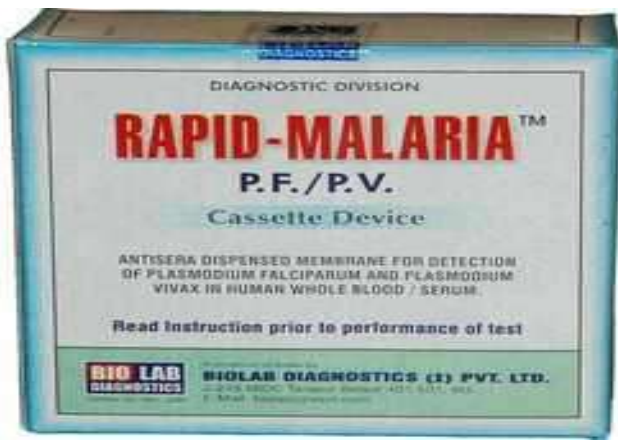
# Rapid diagnostic tests can confirm diagnoses

- Have fairly good sensitivity and specificity if the pre test probability is high



The test is considered negative with the appearance of a single red line in the control area

immunochromatographic : for kala-azar





# Organisms or diseases

- Bacteria
  - M.tuberculosis
  - B.melitensis
  - B.pseudomallei
  - S. typhi, S, paratyphi
  - Meningococcal
- Viruses
  - Dengue
  - Chikungunya
  - Japanese encephalitis
- Protozoa
  - Malaria
  - E.histolytica
  - Leishmania donovani
- Fungi
  - Histoplasma capsulatum
  - Penicillium marneffeii
  - Melanized fungi
- Helminths
  - Wuchereria bancrofti
  - T. solium
  - E.granulosus

# Case 1

- 50 year old lady a diabetic presented with fever, cough and breathing difficulty for 3 days
- On Exam she was conscious, oriented with pulse=128/min; BP = 80/50; RR=32/min and JVP was not elevated
- RS revealed crackles in the left infraaxillary region
- Cardiac arrest soon after and was intubated and shifted to ICU
- Tests: Hb = 8.7mg%; Platelets=34,000; WBC = 13,700; S.Creat =1.7;
- LFT : T.Bil = 1.5; D.Bil=0.6 Alb=1.7; SGOT=89; ALP=187; SGPT=46
- CXR: ARDS

# Fever, cough, breathlessness with hypotension, hepatitis and mild renal failure

What is the diagnosis?

- Malaria
- Scrub typhus
- Typhoid
- Dengue
- Leptospirosis
- Melioidosis

# Scrub typhus



- Eschar- cigarette burn like lesion on the back
- Caused by the bite of larval chigger of the trombiculid mite
- *Orientia tsutsugamushi*
- Diagnosis made by IgM ELISA >16 units
- Treatment by doxycycline or Azithromycin

# Scrub typhus

- Caused by *Orientia Tsutsugamushi*
- Transmitted by bite of larval trombiculid mites also called “chiggers”
- Mites have 4 stages: egg, larva, nymph, adult. Only larva is parasitic
- Accidental infection on encroaching a zone of scrub in the rainy season
- Insert their mouthparts down hair follicles/pores, inject a liquid that dissolves the tissue around bite. Chiggers feed on this liquid tissue and drop off





# Diagnosis

- Microimmunofluorescence
- Dot blot immunoassay
- Weil Felix: Only 50% patients will have positive tests during 2<sup>nd</sup> week of illness
- Minimum positive titer is 1:80 and a four fold rise is significant
- Geographical history, physical signs and rapid response to chemotherapy diagnoses scrub typhus

# Treatment

- Early treatment shows better outcomes and faster resolution than delayed treatment
- Doxycycline 200mg OD, Tetracycline 500mg QID, Chloro 500mg QID,
- Azithromycin 500mg as a single dose useful in pregnant patients

# Control and Prevention

- Personal protective measures: protective clothing, DEET, sulphur, clothes impregnated with permethrin
- Lathering with soap in a hot shower will remove chiggers
- Control of rodent and marsupial reservoir
- Weekly doxycycline has been used as prophylaxis

# Case 2

# Case

- 48 year old lady from Tamilnadu a known case of carcinoma cervix IIIb with her last chemotherapy 15 days ago presented with fever and rash, vomiting and diarrhea
- On exam she had a macular rash white islands on a red sea



- Hb= 11.5g%; TC= 4200 /cu.mm, DC = N 74%, L=10%, B=7%, Myel o 2%, Mono 8%
- Creatinine = 1.2 mg%
- SGOT =252 IU/ml
- SGPT = 80 IU/ml
- Platelets = 40,000 and then dropped to 9000/cu.mm

# Dengue: Clinical Syndromes

- Undifferentiated fever
- Classic dengue fever (DF)
- Severe Dengue
  - Dengue hemorrhagic fever (DHF)  
occurs in <5%
  - Dengue shock syndrome (DSS)
  - Expanded dengue syndrome

# DF: Clinical Characteristics

- Fever
- Headache
- Retro-orbital pain
- Muscle & joint pain
- Malaise
- Nausea, vomiting
- Rash
- Hemorrhagic manifestations
- Lab:
  - Leukopenia
  - Lymphocytosis
  - Thrombocytopenia -55%

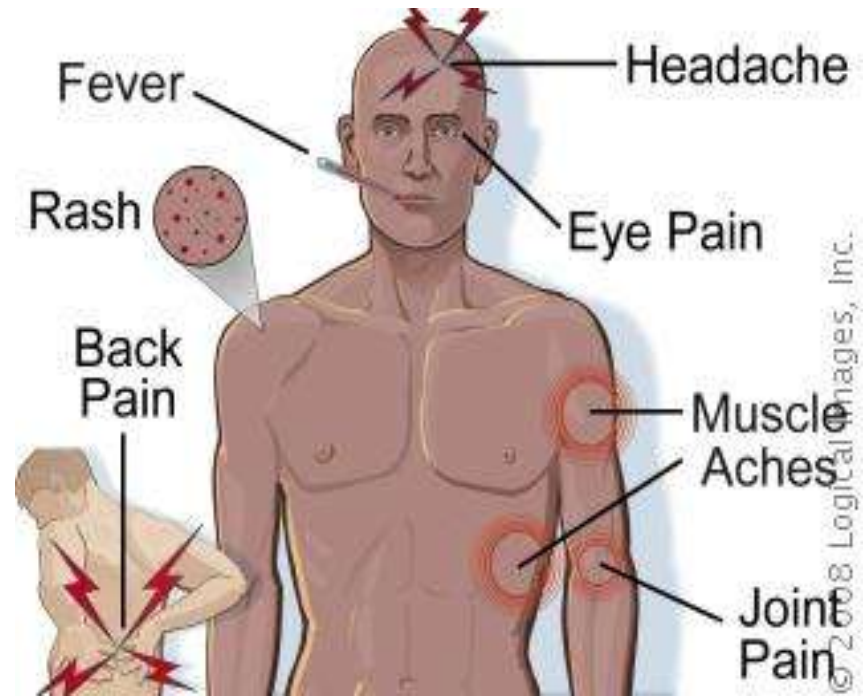


Figure 1.4 Suggested dengue case classification and levels of severity

**DENGUE ± WARNING SIGNS**

**SEVERE DENGUE**



**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 enlargement >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  $\geq$  1000
- CNS: Impaired consciousness
- Heart and other organs



# Treatment

- No specific antiviral drug available
- Avoid aspirin, NSAID, IM injections
- Monitor BP, hematocrit, platelet count, level of consciousness
- Prompt & meticulous fluid replacement
  - Ringer's lactate as effective as colloids for initial resuscitation\*
- Blood transfusion only with overt bleeding
  - No evidence that prophylactic platelet transfusions improve outcome
- No role for steroids
  - No effect on mortality (RR 0.68, 95% CI 0.42 to 1.11), or need for blood transfusion (RR 1.08, 0.52 to 2.24)<sup>1</sup>

# Case 3

# Case

- 54 year old male farmer with fever, jaundice x 7 days
- Irrelevant speech  
fluctuating sensorium
- Decreased urine output and swelling of feet
- Bodyaches
- On exam –Temp 101;  
BP= 130/80;  
HR=100/mt



- Deep icterus, subconjunctival bleed, b/l pedal and sacral edema
- RS: B/L crackles
- Abd: Liver 2cm; Spleen 3 cm
- CNS: GCS 14/15

# IgM Leptospira was +ve

- Labs: TC = 11,900;  
Hb=10g%; Creat = 5.7  
Platelets=32,000; T.bil=  
8.6 ; D.bil=8.0 ; SGOT=  
356; SGPT=127; ALP=  
135; CPK= 4080
- Blood C/S: No growth
- Urine micro: Protein  
+, RBC-  
numerous, WBC=18-20
- Started on Penicillin, did  
well and went home



- What is your diagnosis ?
  - Malaria
  - Viral hepatitis
  - Scrub typhus
  - Leptospirosis
  - Spotted fever

# Risk Factors

- Occupational exposure: farmers, ranchers, abattoir workers, trappers, veterinarians, loggers, sewer workers, rice field workers, military personnel, laboratory workers
- Recreational activities: fresh water swimming, canoeing, kayaking, trail biking
- Household exposure: pet dogs, domesticated livestock, rainwater catchment systems, infestation by infected rodents



# Clinical Features

- **Biphasic clinical presentation**
  - Acute or bacteremic phase lasting ~1 week
  - Immune phase, characterized by antibody production & leptospiruria
- **Anicteric leptospirosis**
  - Abrupt onset of fever, chills, headache, myalgia, abdominal pain, conjunctival suffusion, transient skin rash
- **Icteric leptospirosis (Weil's disease)**
  - Occurs in 5-15% of patients
  - Jaundice
  - Proteinuria, hematuria, oliguria and/or anuria
  - Hemorrhages
  - Myocarditis

# Diagnosis

## 1. Culture (blood, CSF, urine)

- Blood & CSF specimens are positive during the first 10 days of the illness
- Isolation of leptospire from blood successful in ~ 50% of cases
- Urine cultures become positive during second week of illness & remain so for up to 30 days after resolution of symptoms

## 2. Serology

- Microscopic Agglutination Test (MAT)
  - Using a range of *Leptospira* strains for antigens representative of local strains
- IgM ELISA

# Treatment

- Antibiotic therapy<sup>1</sup>
  - Shortens hospital stay, leptospiruria
  - Trend towards ↓ recovery of organ dysfunction, mortality & earlier fever clearance
- Antibiotic regimes
  - Penicillin G 1.5 million U Q6H (iv) x 7 days<sup>2</sup>
  - Ceftriaxone 1 Gm OD (iv) x 7 days<sup>3</sup>
  - Cefotaxime 1 Gm Q6H (iv) x 7 days<sup>2</sup>
  - Doxycycline 100 mg BD (po) x 7 days<sup>2</sup>
  - Azithromycin 500 mg OD x 3 days

<sup>1</sup>Watt G et al. *Lancet* 1988; 1(8583):433–5

<sup>2</sup>Supputamongkol Y et al. *Clin Infect Dis*. 2004;39:1417–1424

<sup>3</sup>Panaphut T et al. *Clin Infect Dis* 2003; 36:1507–13

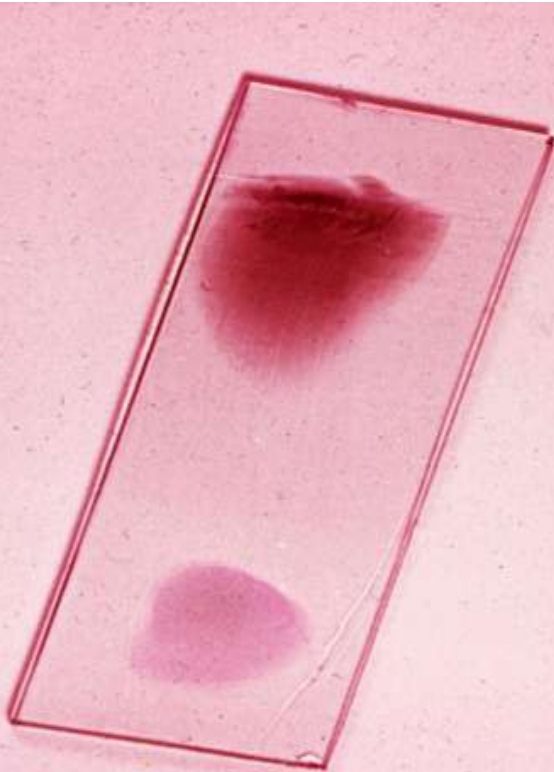


# Prevention

- No vaccine available
- Avoid potential sources of infection
- Doxycycline prophylaxis for individuals who will be exposed to leptospire in highly endemic environments (e.g., military personnel deployed in jungles, veterinarians following urine exposure from animals with known leptospirosis)

# Basic approach

- Rule out malaria – smear sensitivity is 95% in a good lab, in severe P. falciparum malaria – 50%, reasons for negative smear - very low parasitemia, bad lab



1967, A/R 7, clean, trans., air & power. No re- al. down. Call regardless of by 523-7974 agt.

**LASS 442 '67**

**LASS SUPREME, '71**  
TUL lime green, vinyl roof, equipped, bucket seats, only 1000 miles - Must be sold this week - Call Seth or Lew Nesbitt at 341-1107.

1967 2 dr. H. T. Air auto, V8, extra nice, one low mileage car - Call Seth at 636-4309 agt.

1966 Polara, 4 door automatic, power steering, excellent condition, by original owner. 523-2529-9119.

RT - 1970, 440 engine, S.S., P.B., orange, white vinyl interior, low mileage, call Bob Davis, 636-4309 agt.

72 Swinger H. Top, Air, Nearly New. Make 2 or 3 assume loan. 633-4345 Agent.

1969, Super Bee, vinyl power steering, road wheels. Owner. 51345, 941-1603.

71 Coronet 4 dr. Air, Make 2 or 3 pmts. Assume loan. 523-2529-9119

passenger, power, air, private, \$3,300. Days, 876-0311; evenings, 255-7438.

FORD - '71 E-100 Econoline Super- van V8 Engine, Auto Trans. Real Sharp \$2,495 Call Bill Preuty 636-4309 agt.

FORD - '71, Van 302-V8, auto, trans., PS, 9,000 miles, like new. Call or see Bert Noble, 761-0677, agt.

FORD - 1967, 10-passenger Country Squire, rebuilt engine, power brakes, steering, air, extras. 495, 492-2287.

FORD FAIRLANE - 1969, air condit- ioned, power steering low mileage, \$1600. Home, 284-8667, work, 763-2157.

FORD '66 F'lane, 4 dr., auto, 766d, new tires, very clean, Fin. entire amt. We handle credit. 873-3094 agt.

FORD - '70 Ranchero P.S. Air Cond. Auto, V8 engine. Exceptionally nice Call Bob Downs 636-4309 agt.

FORD TORINO, 1970, Squire, fully equipped, still under warranty, before 5, 422-5240, after 5, 422-4932.

FORD - 1965, Fairlane 300, 2-door hardtop, white sidewalls, air, excel- lent condition. 478-1248, after 5.

FORD - Wm. '64, Cury. Sqr., 9 pass., V-8, auto, air, pwr., rack, \$550, trade. fin. 288-5134, agt.

FORD - 1968, Tudor, 428, air condi- tion, disc brakes, automatic, immac- ulate, \$950, trade. 373-2883.

FORD - 1966 Galaxie, 2 door hard-

COI  
LINCOLN  
Lincoln Cor  
Collectors h  
\$1,695. C  
LINCOLN - 19  
room, Black  
equipped. 12:00-7:  
LINCOLN '70 M  
leather seats. A  
Must see. 873-3112  
Lincoln's '66, '67,  
all makes. Sale.  
LINC. - '70. La  
Cheshire Fridge. 8  
LTD COUNTRY  
1970, power stee  
air, 45,000 mile-  
284-8857, nights, 97  
MALIBU, 1969, p  
matic, black vinyl  
dition, \$1,550, 971-1  
MA  
'70 by owner, bla  
option, mint cond  
286-5089.  
MACH I, 1971,  
Power steering.  
payments. 924-642  
MACH I - '68 M  
car. Call Frank

# Incubation period

- Classify by the timing of exposure to find possible incubation period
- < 2 weeks: Malaria, dengue, bacterial infections, hemorrhagic fevers, rickettsial infections, leptospirosis
- > 2 weeks: Brucellosis, vivax malaria, visceral leishmaniasis, fascioliasis, tuberculosis, histoplasmosis, penicilliosis, schistosomiasis

# Prolonged fever is tricky

## Prolonged fever > 2 weeks

- Often multisystem involvement
  - Non-infectious mimics
  - Already been given trial of antibiotics, ATT before seeing you
  - A thorough history, meticulous and repeated clinical examinations yield clues
  - Disease is in continuous evolution so likely to have a diagnosis eventually
- TB, Histoplasmosis
  - Penicilliosis, Brucella
  - Melioidosis, Nocardia
  - Leishmaniasis
  - Sarcoidosis
  - Lymphomas
  - Vasculitis

# Case 4

- 65 year old Mr B from North India presented with fever, weight loss of 6 months duration, abdominal distension and breathing difficulty
- Diagnosed as MDS outside and given blood transfusions, cyclosporine and hydroxyurea
- On exam he was pale, had pedal edema, JVP was elevated, fine crackles at both bases



Hb = 6.7g% ; TC = 2700/cu.mm  
Platelets = 55,000/cu.mm  
T. Bil = 1.9 , D.Bil = 1.5  
Total protein=11.5  
Albumin = 1.9  
Alkaline phosphatase = 305

Fever, weight loss, abdominal distension with hepatosplenomegaly and pancytopenia and hypergammaglobulinemia

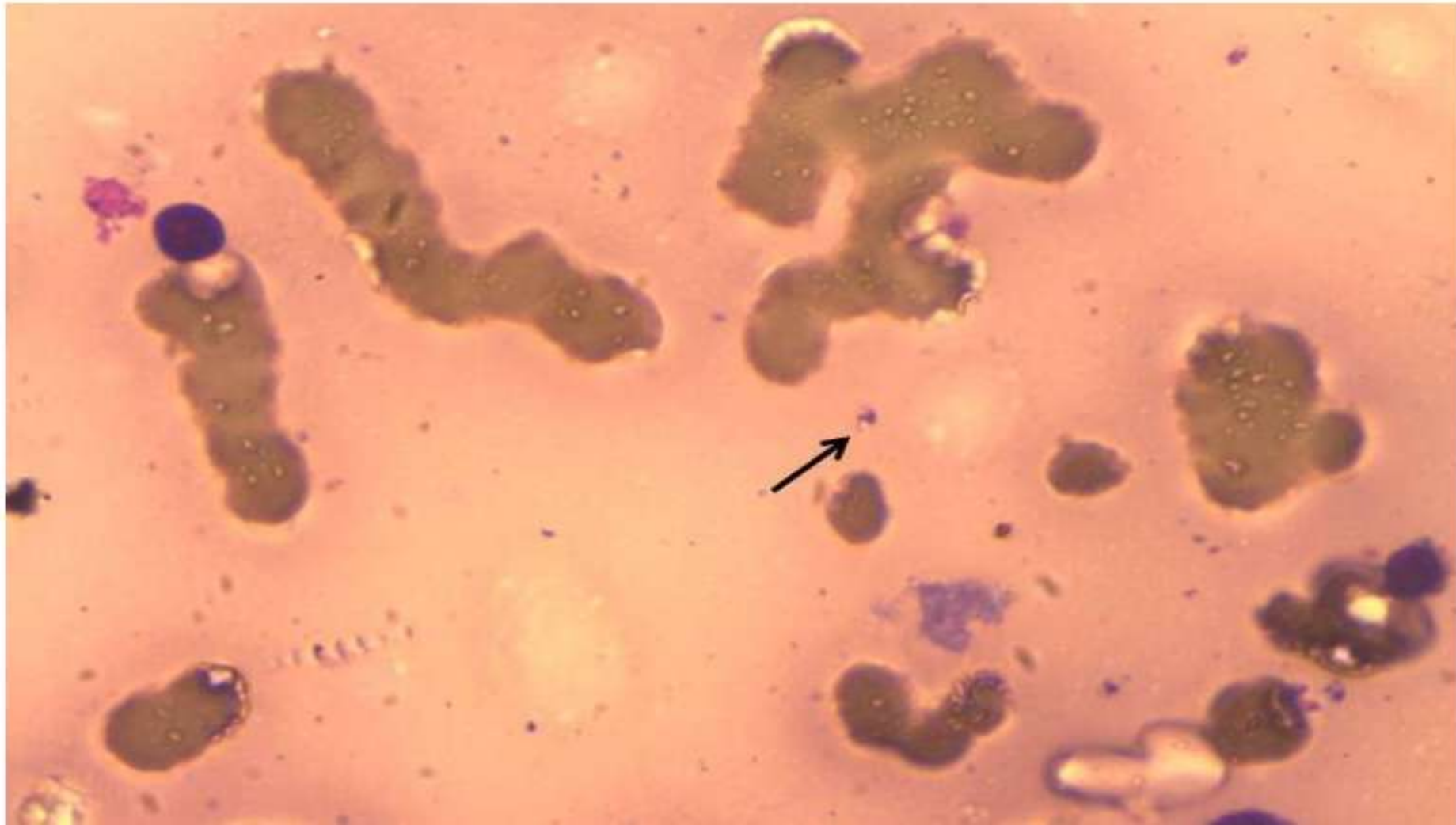
What is your diagnosis ?

1. Malaria
2. Visceral leishmaniasis
3. Leukemia
4. Non Hodgkins lymphoma
5. Disseminated Histoplasmosis



# Clinical Tropical Medicine

Christian Medical College, Vellore, Tamilnadu, India

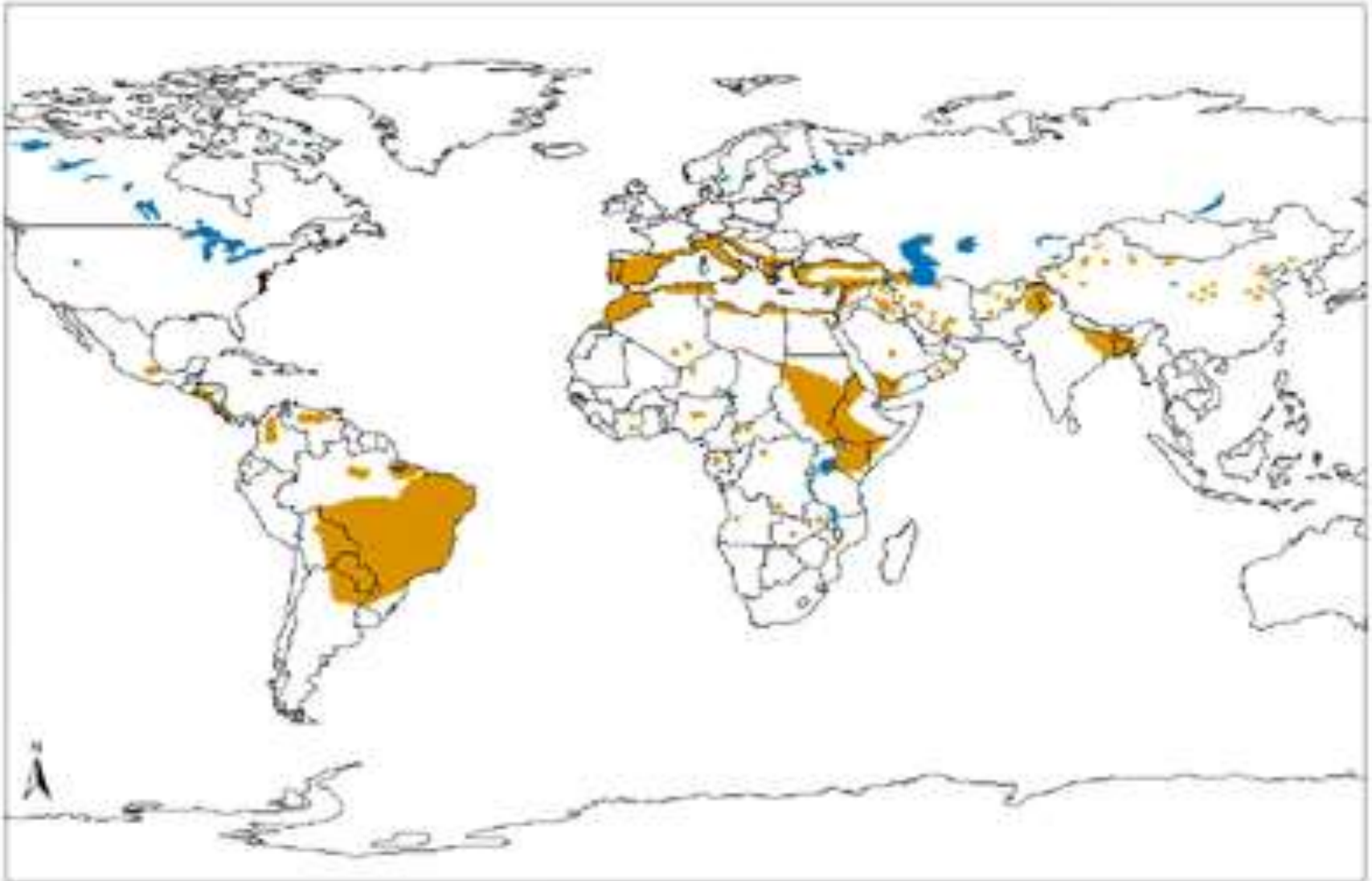






- Bone Marrow: LD bodies
- He was treated with 1 dose of Liposomal Amphotericin B
- Continued to have fever in hospital and blood C/S grew *S.pneumoniae*
- Since his consolidation did not settle we re-evaluated him and sputum AFB was positive
- He was subsequently treated for Pulmonary tuberculosis as well with which he finally settled

# Geographic distribution of visceral leishmaniasis



# Case 5

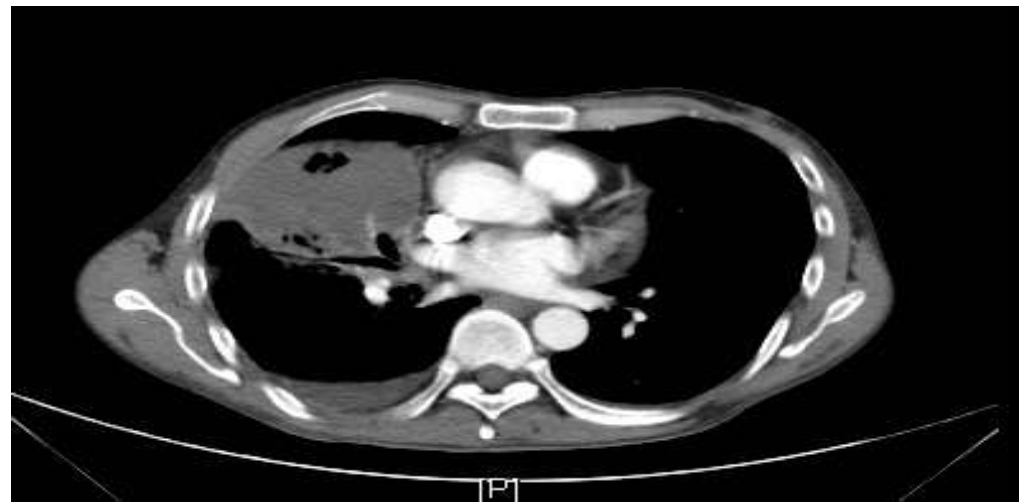
- 45 yr old man, from Meghalaya
- Cough x 3 months
- Minimal expectoration ; no fever
- Skin lesion – over chin – 2 to 3 months
- Oral lesions & pain on swallowing x 2 wks
- Seropositive for HIV
- Skin lesion over chin
- Oral candidiasis – Rx
- Pulse 84/min; BP 130/80 ; RR 20/min



- No SLNE
- RS: trachea central; lungs clear
- CVS & CNS : Normal
- P/A: liver 2 to 3 cms ; Spleen – 2 to 3 cm



- Hb: 7.5
- Platelets: 90,000
- TC: 7300, DC:  
N82, E2, L7, M9
- Creat: 1.0
- LFT: 0.4/0.2/  
8.9/3.6/152/91/109
- AC: 70 PC: 87
- VDRL : weakly reactive



# Immunocompromised with fever, necrotizing pneumonia, bicytopenia and skin lesions from North East India

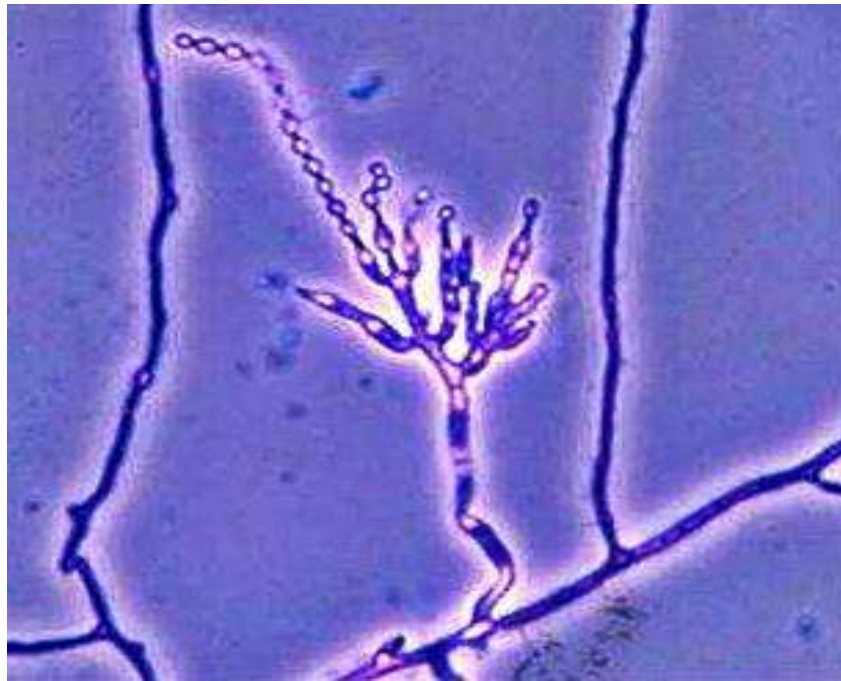
- What is your diagnosis?
- Tuberculosis
- Pneumococcal sepsis
- Disseminated Histoplasmosis
- Disseminated Penicilliosis
- Non Hodgkins lymphoma

# Skin biopsy showed *Penicillium marneffe*



- Systemic fungal infection in HIV-infected patients in Southeast Asia prior to the era of potent antiretroviral therapy (ART).
- Potential reservoirs: Humans and bamboo rats
- Transmission: airborne route, inhalation of conidia from environmental reservoir
- Occurs late in the course of HIV infection: CD4 less than 100 cells

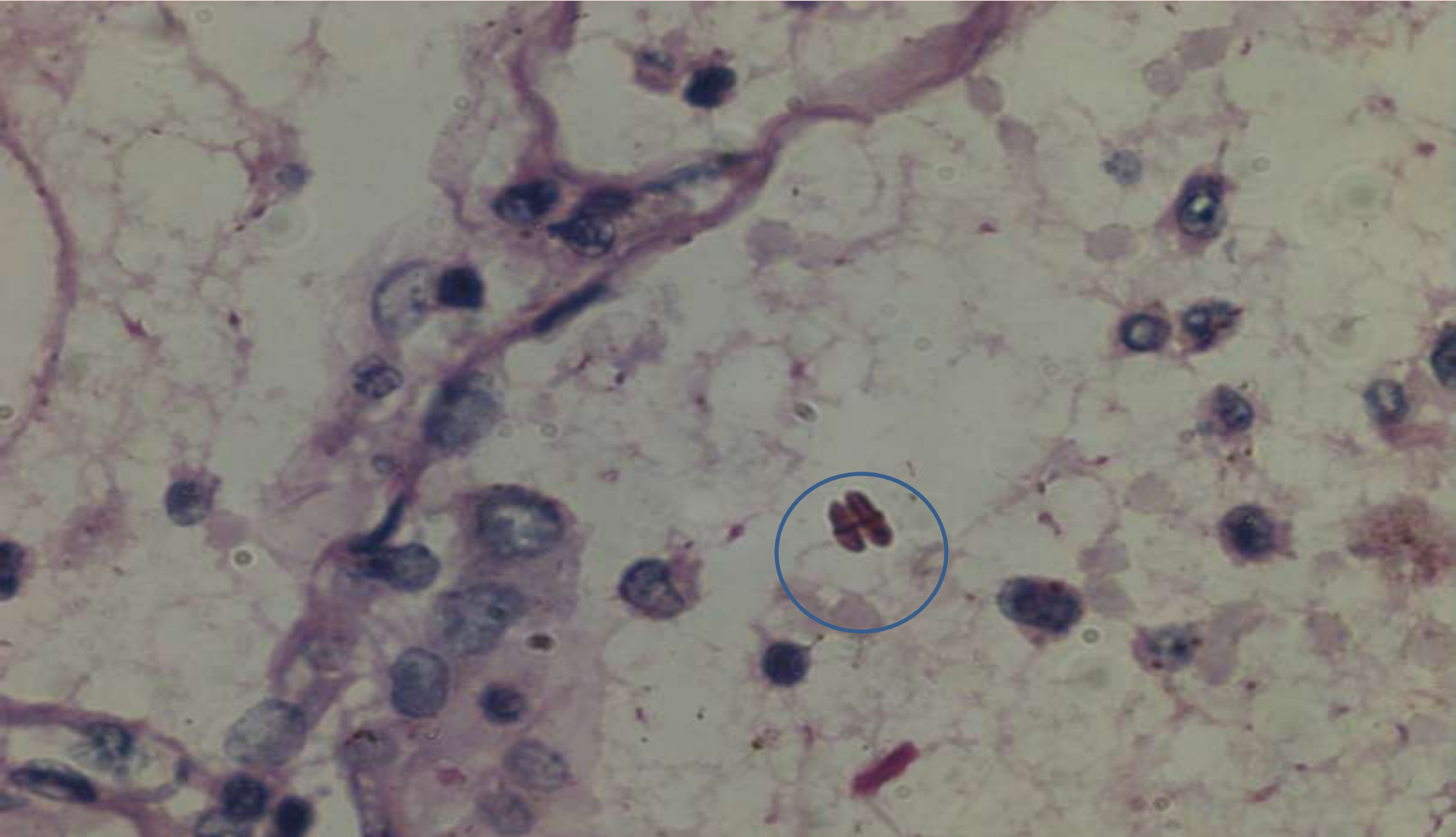
# *Penicillium marneffe*



- Dimorphic fungus
- At 25°C in Sabaroud's Dextrose agar, it grows as a mould
- Characteristic red pigment that diffuses into the agar
- Mycelia: septate hyphae with lateral and terminal conidiophores
- White to tan coloured colonies of yeast at 37°C
- Round to oval with a central septum rarely seen on histopathology



# Gram stain of a different patient with a chin ulcer



Yeast forms divide by binary fission in *penicillium marneffe* as compared to *Histoplasma Capsulatum* which buds out

# Further management in our patient

- Amphotericin B 0.6 mg/kg for 2 weeks
- Itraconazole 200 mg twice daily for 6 months
- Suppressive therapy: Itraconazole 200 mg once daily till CD4 counts > 100 cells for 6 months
- Antiretroviral therapy: Tenofovir, Emtricitabine and Efavirenz

# Case 6

# History



- 55 yr old male, a diabetic from West Bengal, presented with fever for 8 months
- Low grade fever, weight loss of ~3Kg in 6 months
- Generalized weakness, poor appetite
- No cough, breathing difficulty or GI symptoms
- No recent travel outside the country

# Examination

- Temp-101F, HR-90/min ; BP-130/80,
- Pallor + no icterus or lymphadenopathy
- Skin – normal
- CVS: normal
- RS: clear
- P/A: no hepatomegaly spleen 1cm palpable
- CNS: no focal deficits

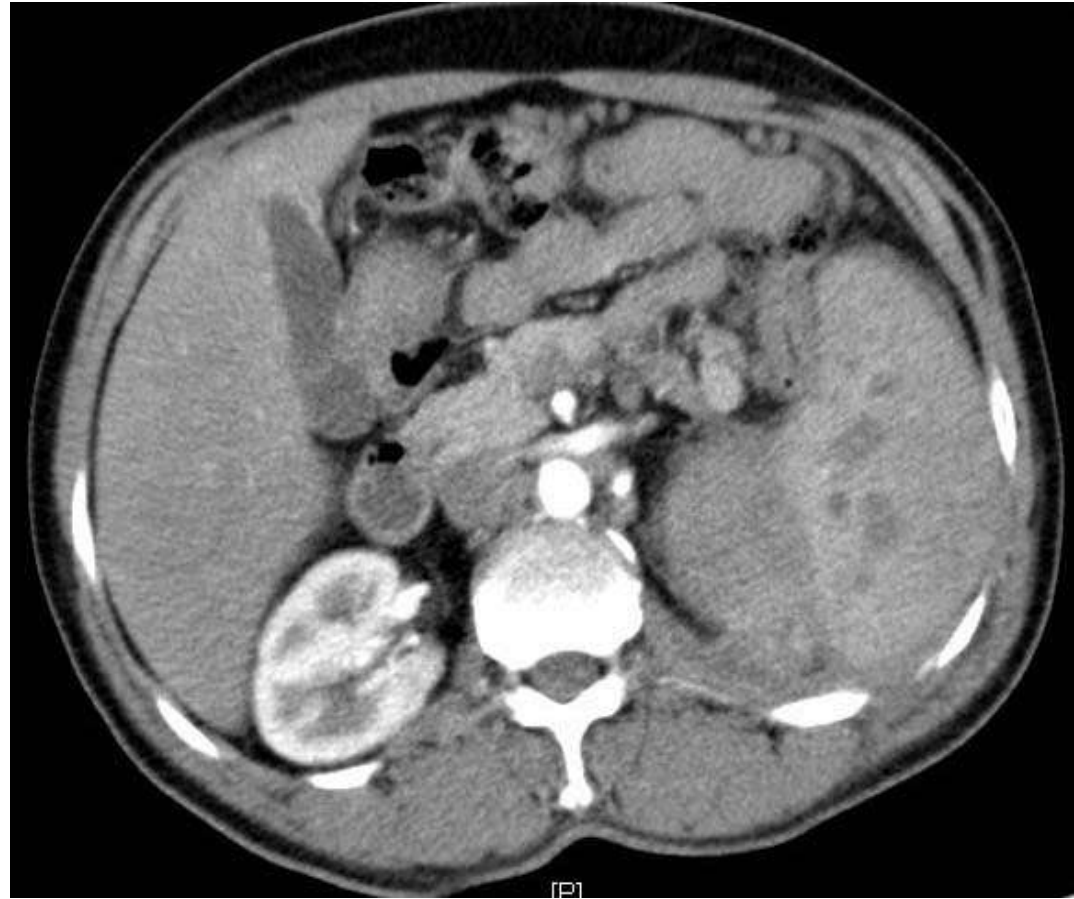
# Investigations

WBC	10600/cumm (N53, E19, L22, M6)
Hb	10.2 gm/dl
Platelets	121000 /cumm
Na	138 mmol/l
K	4.5 mmol/l
Cr	0.9 mg/dl

T. bilirubin	0.6 mg/dl
D. bilirubin	0.2 mg/dl
SGOT	38 U/L
SGPT	50 U/L
Alkaline phosphatase	71 U/L
ESR	100

# Investigations contd.

- CXR: Normal
- U/S Abdomen: Mild splenomegaly with small (<1cm) hypoechoic lesions
- CT abdomen



# What is your diagnosis ?

1. Extrapulmonary tuberculosis
2. Melioidosis
3. Histoplasmosis
4. Brucellosis
5. Non Hodgkins Lymphoma



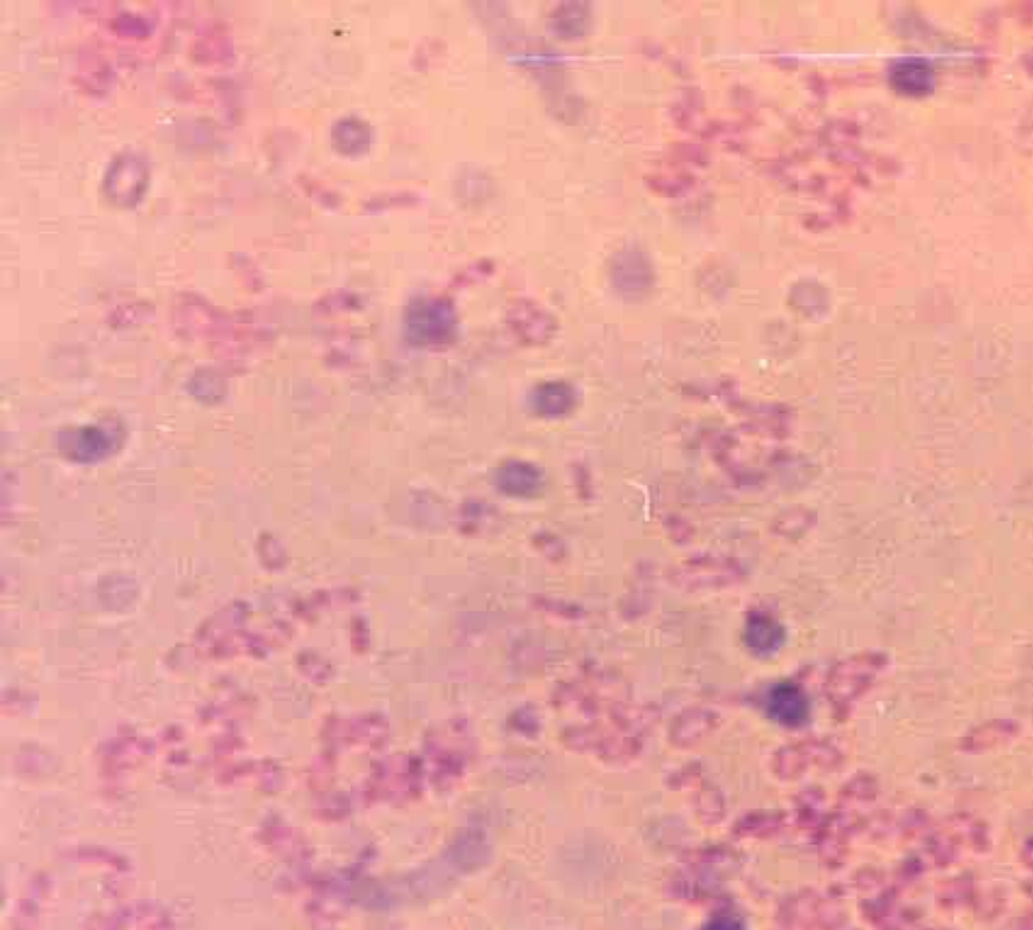
# Further workup & treatment

- Brucella serology – negative
- HIV ELISA – negative
- Bone marrow aspiration and biopsy - normal
- Aspiration of splenic lesions was not done as technically difficult
- Started on Antituberculous therapy – Isoniazid, Rifampicin, Ethambutol and Pyrazinamide and took for 1 year

# Further course

- Came back with discharging sinus from L lumbar region after 4 years
- ATT taken for total 1 year
- Persisting lethargy & weakness
- Splenectomy performed on advice from ID – culture grew





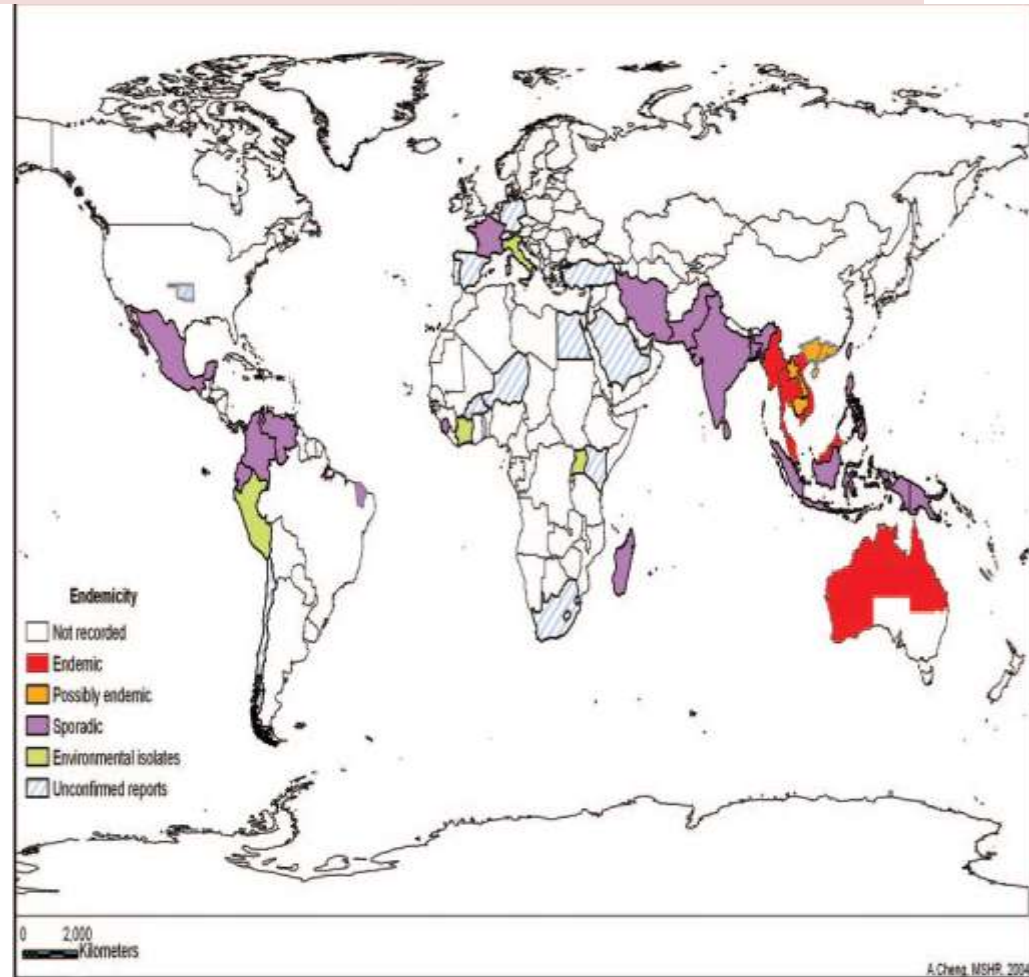
**Gram negative bacillus showing Bipolar staining – closed safety pin appearance**

# The organism is

1. Burkholderia cepacia
2. Clostridium tetani
3. Clostridium perfringens
4. Burkholderia cepacia
5. Burkholderia pseudomallei

# Melioidosis

- It is caused by *Burkholderia pseudomallei*
- Endemic in South and South-east Asia, Oceania and Northern parts of Australia
- Modes of transmission include inhalation and percutaneous inoculation



Cheng et al. Clin Microbiol Rev 2005: 383-416

- Risk factors include diabetes, alcohol, chronic renal or lung disease
- Diagnosis is by culture of appropriate specimens – blood, urine, sputum, pus etc
- Predictors of mortality included multifocal disease or septicemic disease, hypoxia or altered sensorium
- Treatment includes an intensive phase for 2 weeks and eradication phase – Ceftazidime, Imipenem, Meropenem followed by doxycycline, TMP/SMX or a combination
- Adjunctive therapies like G-CSF may be useful in septic shock

**Melioidosis can present as an acute Septicemia or as a chronic granulomatous disease resembling tuberculosis**

# Take home messages

- Fever in the tropics is wide and varied depending on the duration of illness, geographic locale and immune status of the host
- Common AUFI < 7 days are the big “5” – Malaria, Scrub typhus, Leptospirosis and Typhoid
- Common causes of prolonged fever are a bit more tricky and require a good understanding of the environment, host and geographical susceptibility to make a diagnosis
- A high index of suspicion and appropriate lab tests are required to make a diagnosis of non malarial febrile illnesses and prolonged fevers

# THANK YOU!

