TROPICAL FEVER EVALUATION

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PRESENTATION OBJECTIVES

- Identify the unique challenges to evaluating tropical fever
- Employ an effective rationale in differential diagnosis
- Develop reliance upon only limited diagnostic aids

NOT ADDRESSED TODAY: FEVER AMONG TRAVELERS


CAN YOU SOLVE
THIS CASE OF
TROPICAL FEVER?

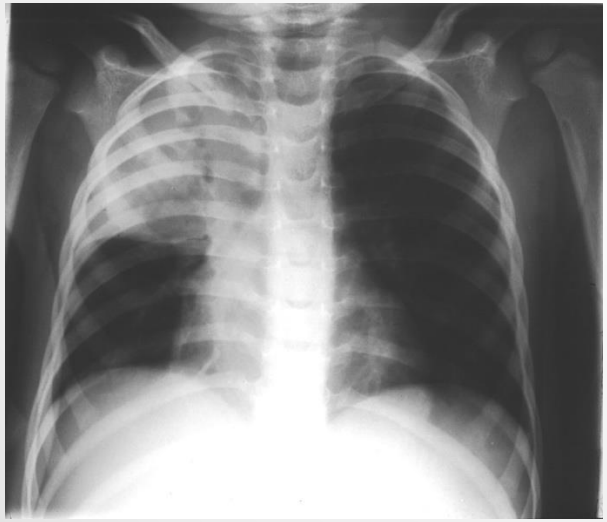
Scenario 1

WHY IS EVALUATING FEVER IN A TROPICAL SETTING UNIQUELY CHALLENGING?

TROPICAL FEVER CHALLENGES

- Unfamiliar causes
- Unusual causes
- Limited laboratory and imaging
- Cultural unfamiliarity
- Out of practice clinical skills
- Time pressure

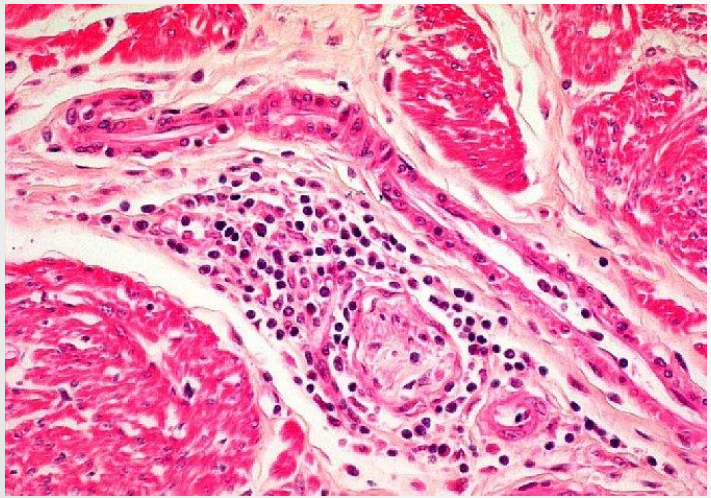
WHAT DO YOU KNOW ABOUT PATHOGENESIS OF FEVER?



FEVER MOST COMMONLY IS…

- A physiological response to infection, mediated principally via cytokines.
- Cytokines alter thermoregulation in the hypothalamus through a process mediated by *prostaglandins*.

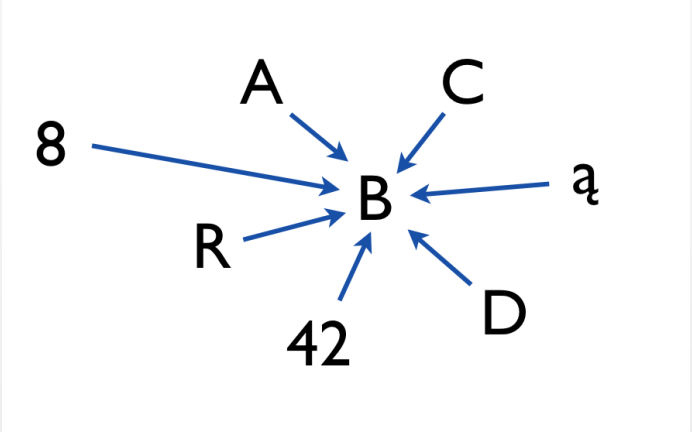
WHAT NON-INFECTIOUS ETIOLOGIES CAUSE FEVER?



NON-INFECTIOUS CAUSE OF FEVER

- Malignancies, especially lymphomas, leukemias, and renal cell CA
- Autoimmune diseases, including rheumatoid arthritis, temporal arteritis, polyarteritis nodosa
- Drug reactions

FOR FEBRILE, TROPICAL-LOCALE PATIENTS, MULTIPLE CAUSES MUST BE CONSIDERED



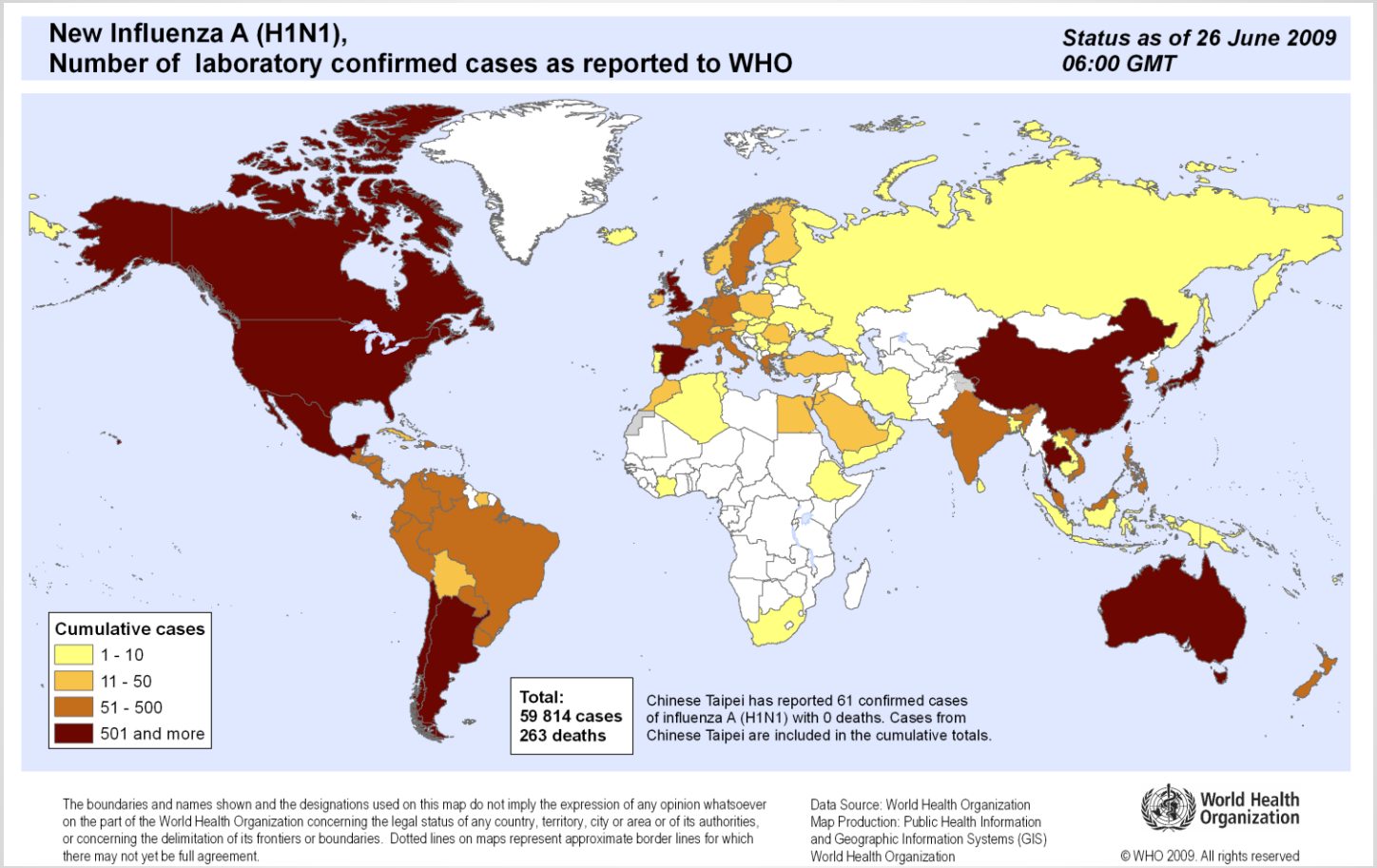
CLINICAL APPROACH TO FEBRILE TROPICAL-LOCALE PATIENTS

A Search For Clues

APPROACH TO FEBRILE TROPICAL-LOCALE PATIENTS: EPIDEMIOLOGY

- Knowledge of local epidemiology is extremely useful in assessing risk
- Local epidemiology may change suddenly with occurrence of epidemics, such as Marburg virus

WHERE IS INFLUENZA COMMON?


New Influenza A (H1N1),
Number of laboratory confirmed cases as reported to WHO
Status as of 26 June 2009
06:00 GMT
Cumulative cases
1 - 10
11 - 50
51 - 500
501 and more
Total:
59 814 cases
263 deaths
Chinese Taipei has reported 61 confirmed cases of influenza A (H1N1) with 0 deaths. Cases from Chinese Taipei are included in the cumulative totals.
The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.
Data Source: World Health Organization
Map Production: Public Health Information and Geographic Information Systems (GIS)
World Health Organization
World Health Organization
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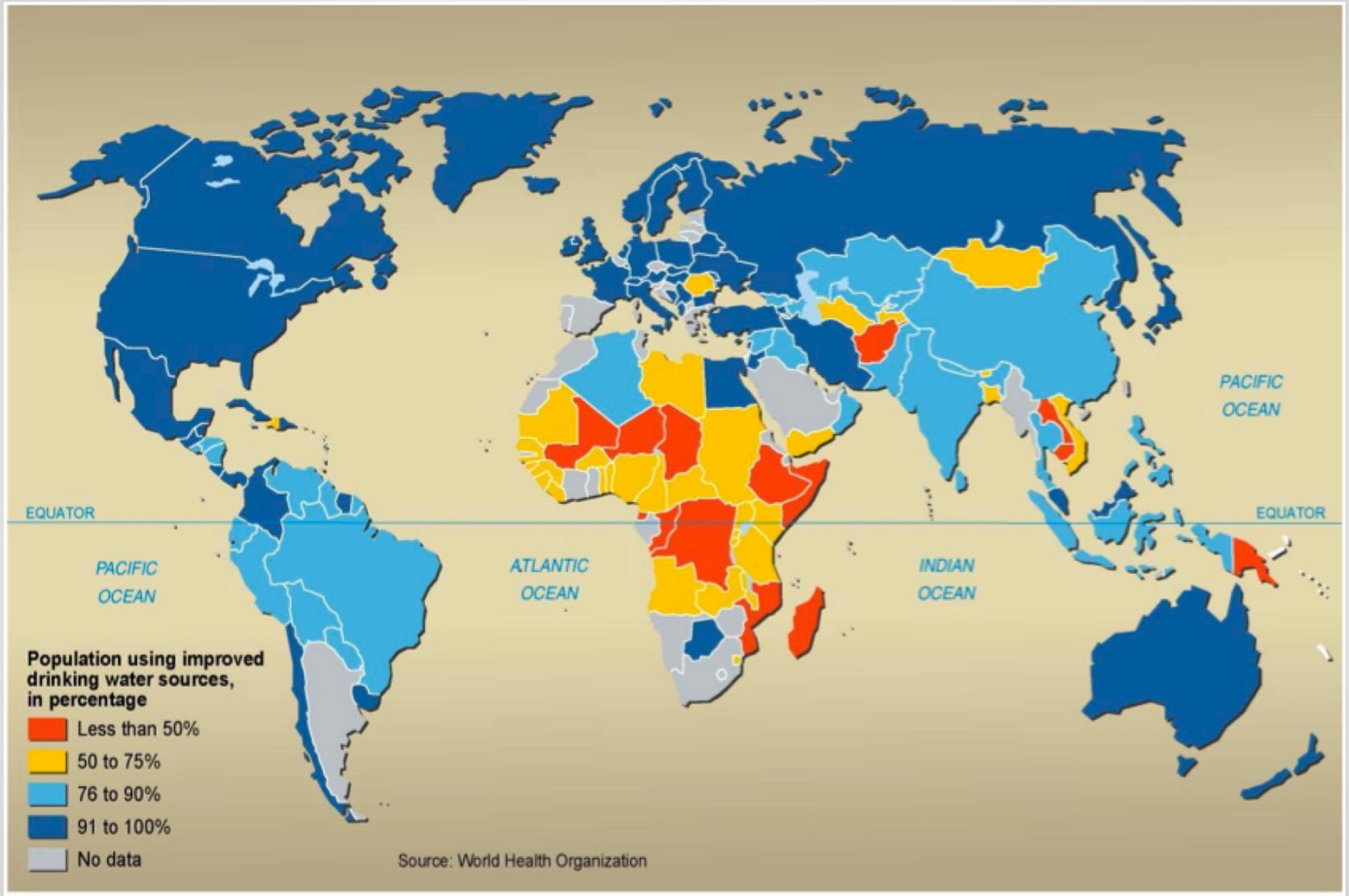
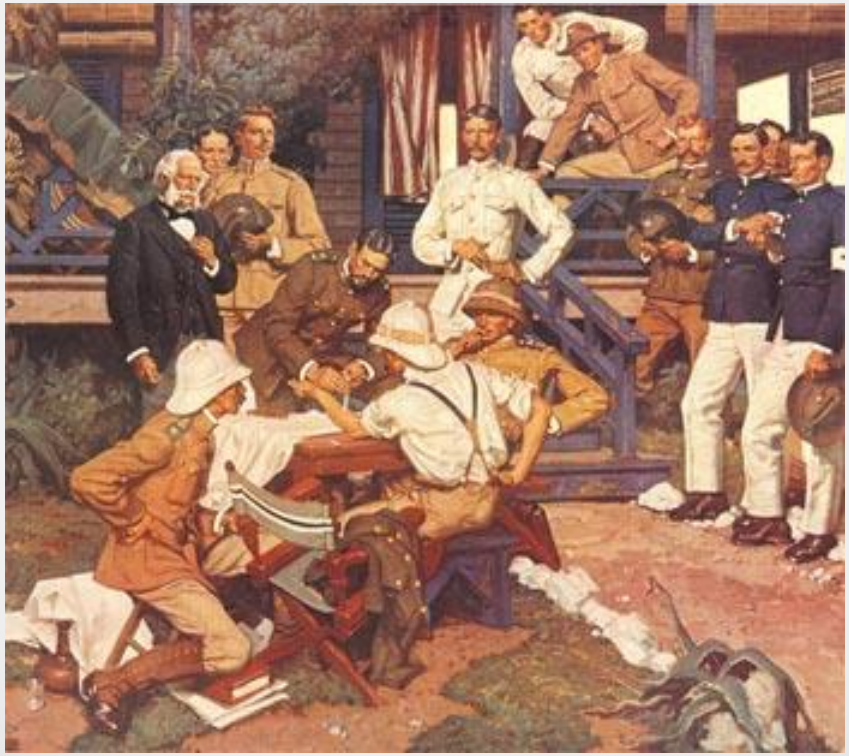
INFLUENZA

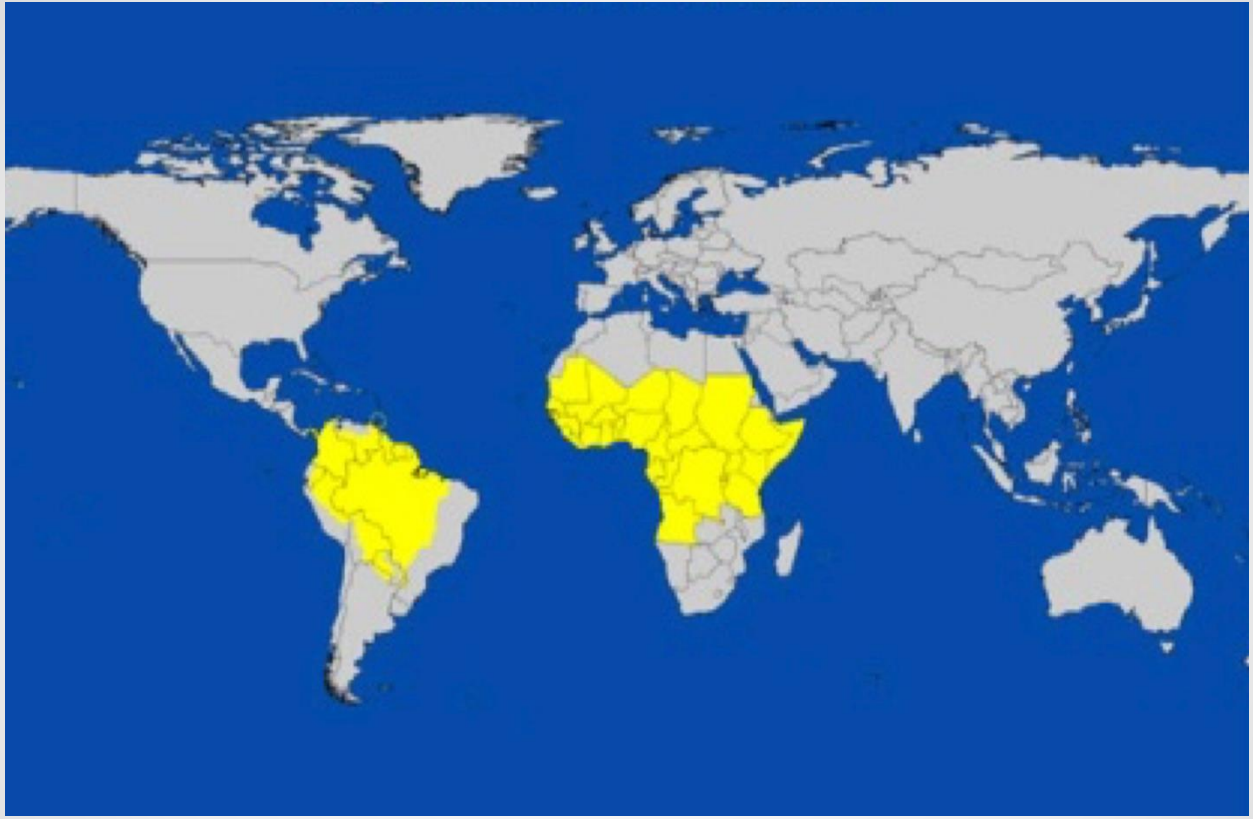
WHERE IS TYPHOID COMMON?

TYPHOID DISTRIBUTION


PACIFIC
OCEAN
EQUATOR
EQUATOR
PACIFIC
OCEAN
ATLANTIC
OCEAN
INDIAN
OCEAN
Population using improved drinking water sources, in percentage
Less than 50%
50 to 75%
76 to 90%
91 to 100%
No data
Source: World Health Organization

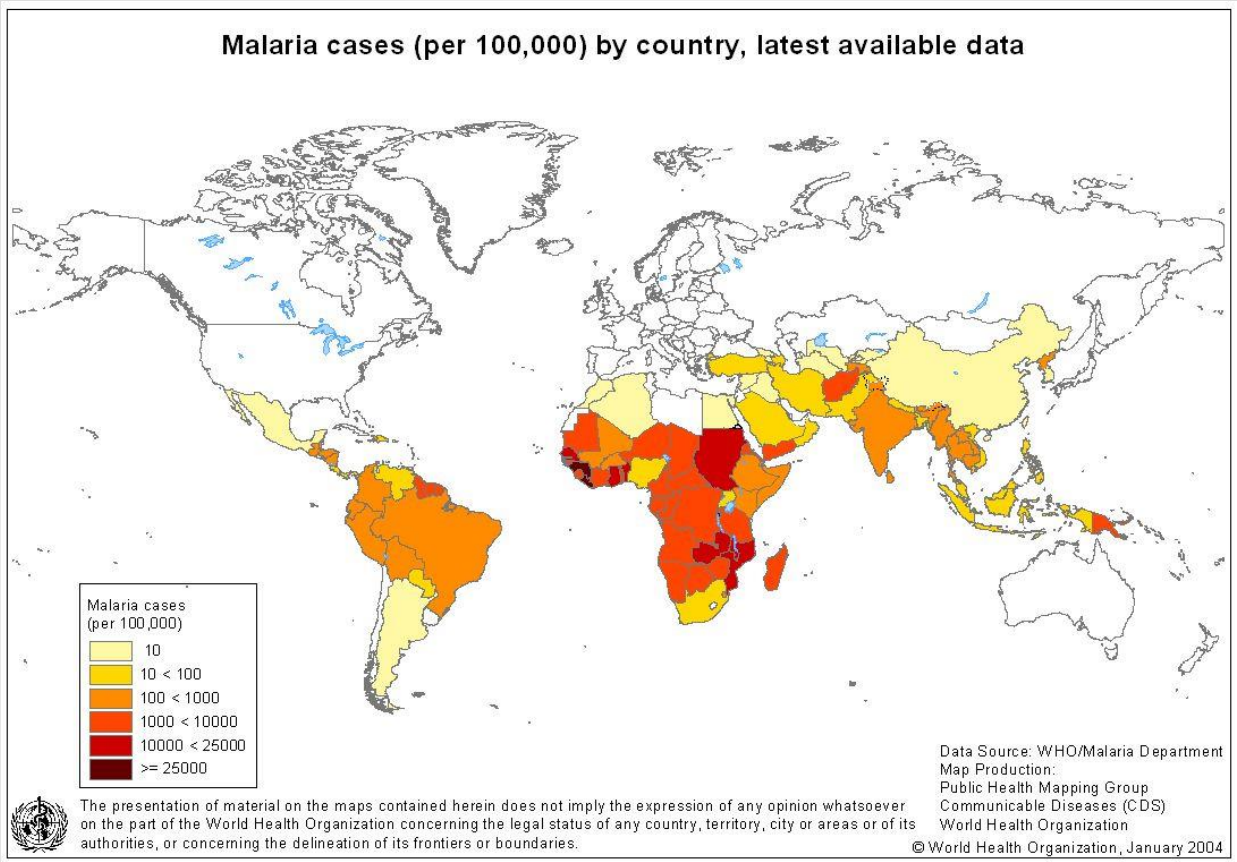
WHERE IS YELLOW FEVER COMMON?





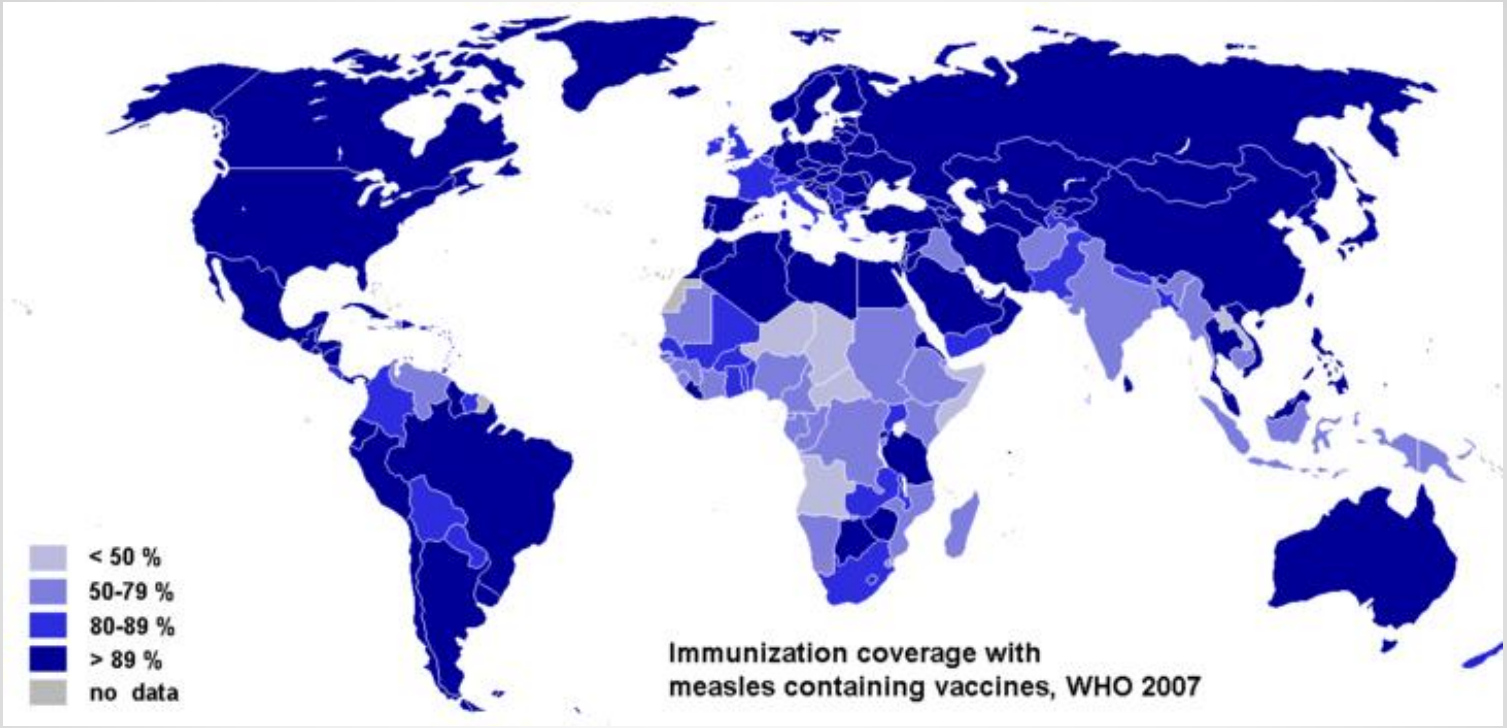
YELLOW FEVER DISTRIBUTION

WHERE IS MALARIA COMMON?



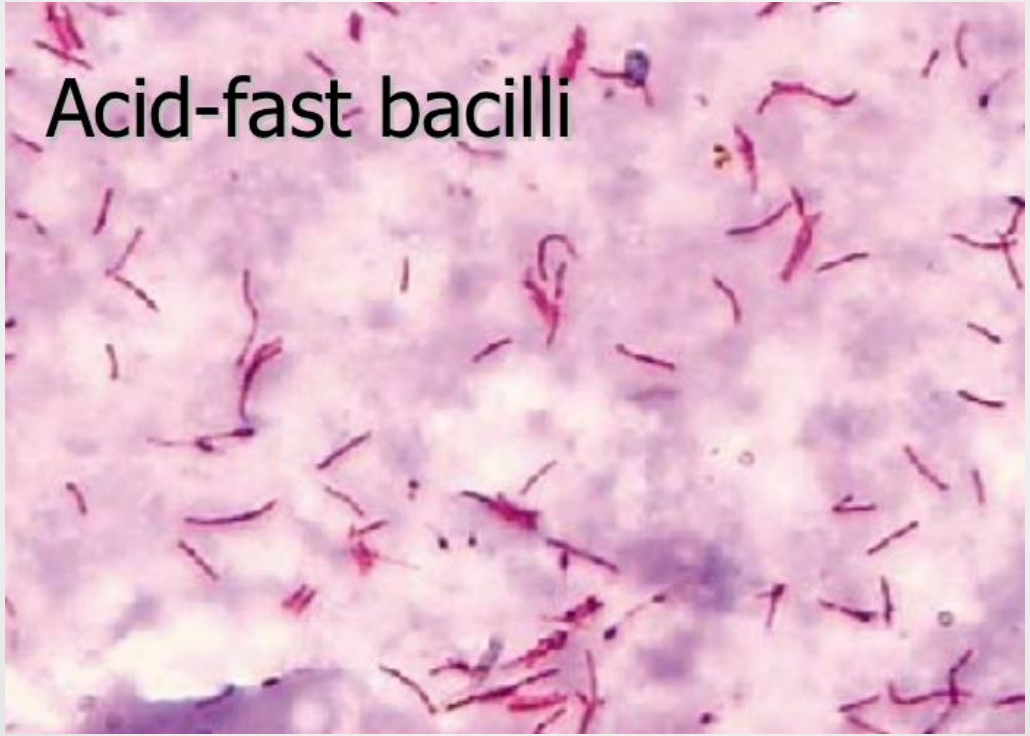
MALARIA DISTRIBUTION

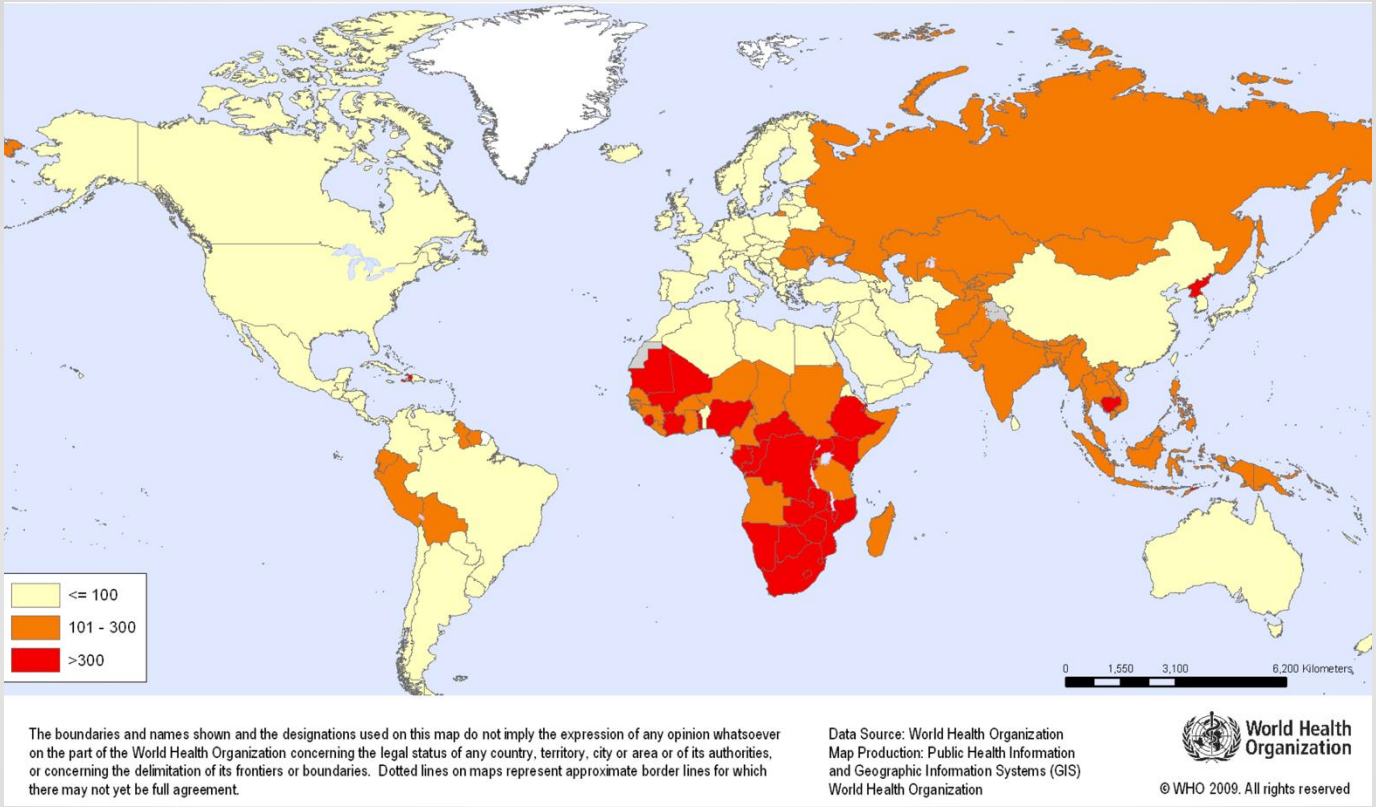
WHERE IS MEASLES COMMON?



MEASLES VACCINE COVERAGE

WHERE IS TB COMMON?





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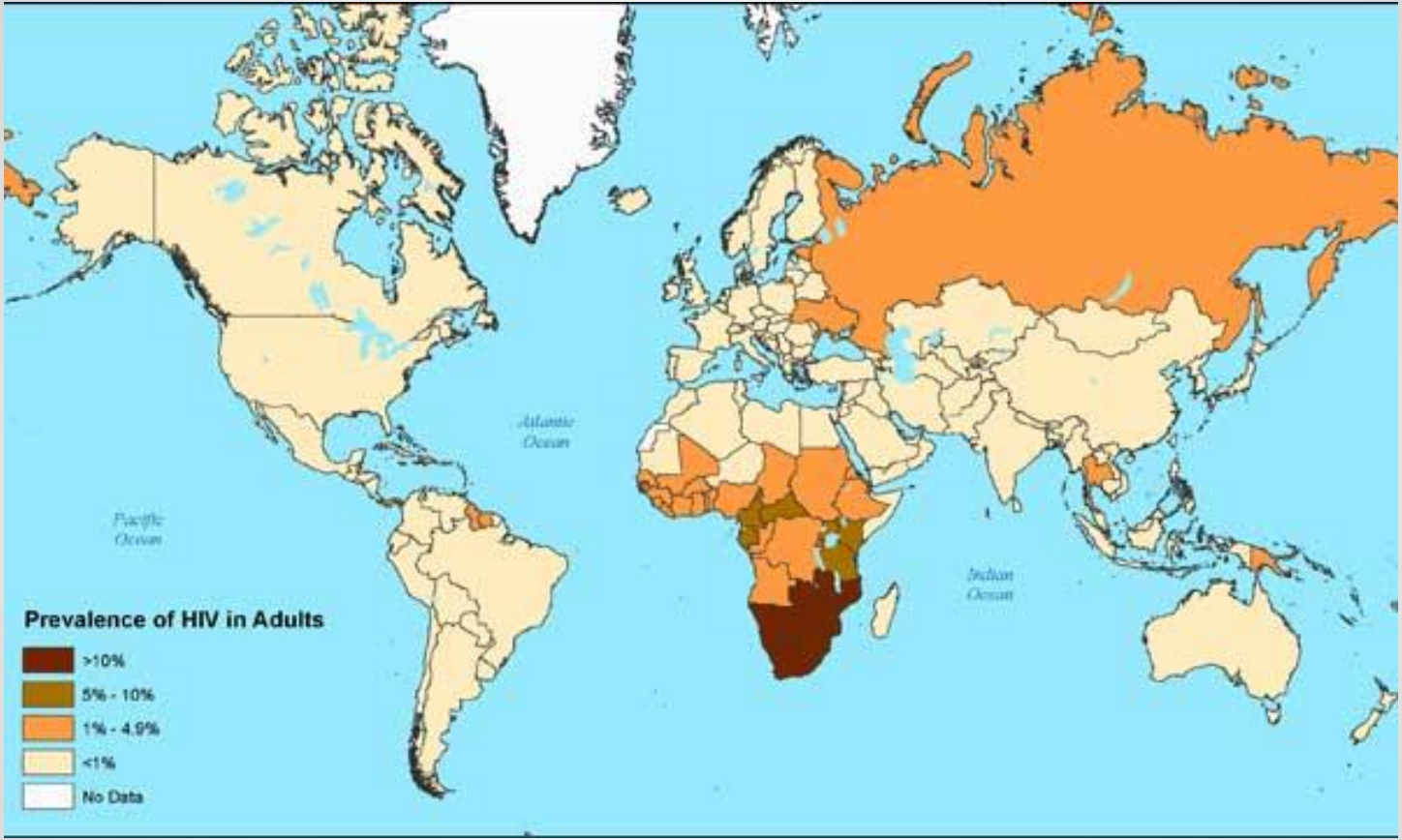
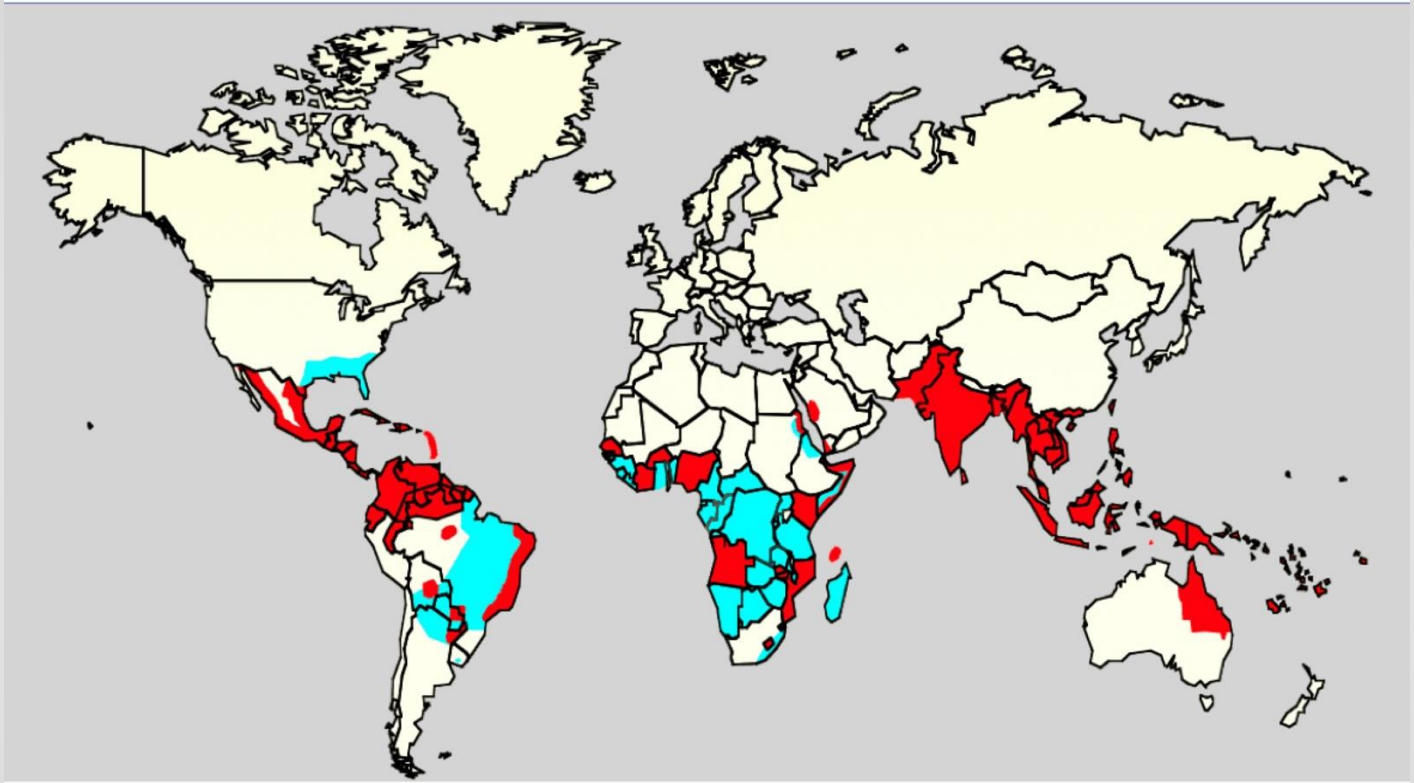
TUBERCULOSIS INCIDENCE

WHERE IS HIV COMMON?



HIV PREVALENCE

WHERE IS DENGUE COMMON?



DENGUE DISTRIBUTION

Scenario 1 Diagnosis: Dengue Fever

WHAT DO YOU KNOW ABOUT DENGUE FEVER?

DENGUE SIGNS & SYMPTOMS

- Abrupt onset of fever and chills
- Severe frontal headache, painful eye movement, and musculoskeletal and lumbar pain present in 70% of patients.
- Anorexia, nausea and vomiting occur in half of patients.
- Initial examination is usually nonspecific and may reveal scleral injection, generalized lymphadenopathy and bradycardia relative to fever.

QUESTION

Which ONE statement about dengue fever is NOT true?

A The dengue vaccine is highly protective.

B The vector for dengue is the *Aedes aegypti* mosquito.

C Dengue most commonly occurs in Southeast Asia and Latin America.

D Treatment is essentially supportive with particular attention to hemodynamic status.

E Infection may progress to complications that include hemorrhage and shock.

ANSWER

Which ONE statement about dengue fever is NOT true?

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APPROACH TO FEBRILE TROPICAL-LOCALE PATIENTS

WHAT CLUES CAN BE GLEANED FROM THE HISTORY?

HISTORY

- Rigors & night sweats suggest a febrile illness even if the patient is afebrile
- Weight loss suggests significant disease
- Pattern of fever is rarely helpful
- A self-recorded temperature chart may be useful
- Upper Respiratory Infection symptoms suggest viral cause

HISTORY

- Freshwater exposure suggests schistosomiasis
- In children, feeding, weight change, and activity are useful measures
- Localizing symptoms should be sought, such as headache, photophobia, cough, sputum, pleurisy, painful sites, diarrhea, urinary symptoms

WHAT CLUES CAN BE GLEANED FROM THE PHYSICAL EXAM?

PHYSICAL EXAM

- Pulse rate > 120 or systolic BP <100 suggest serious illness
- Spontaneous hemorrhage suggests viral hemorrhagic fever
- Psychosis (typhoid)
- Altered consciousness or neck stiffness (meningitis)

WHAT IS THIS FINDING?

APPROACH TO FEBRILE TROPICAL-LOCALE PATIENTS: EXAM

- Cervical and axillary adenopathy (TB, HIV, CMV, EBV, lymphoma, toxo, syphilis
- Occipital adenopathy (rubella, American trypansomiasis)
- Inspect eyes for anemia, jaundice, conjunctival injection (measles, leptospirosis)
- Inspect fundi for endocarditis
- TMs in children

PHYSICAL EXAM

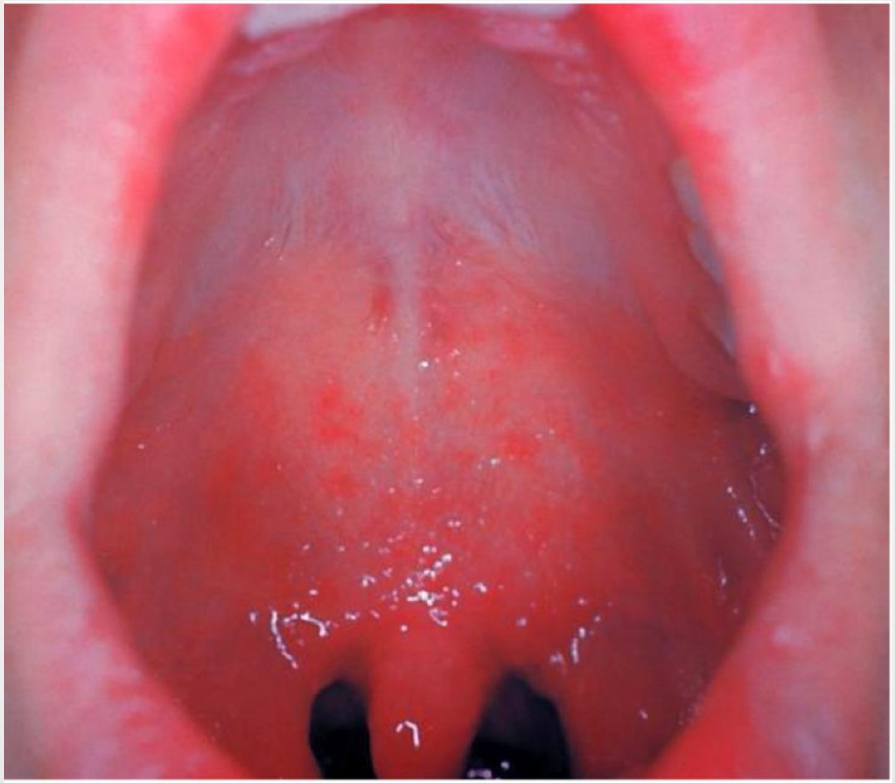
- Chest exam for pneumonia, pleural or pericardial effusion (TB, empyema)
- Heart murmurs (endocarditis, rheumatic disease)
- Abd tenderness (appendicitis, peritonitis, PID, amebic liver abscess)

PHYSICAL EXAM

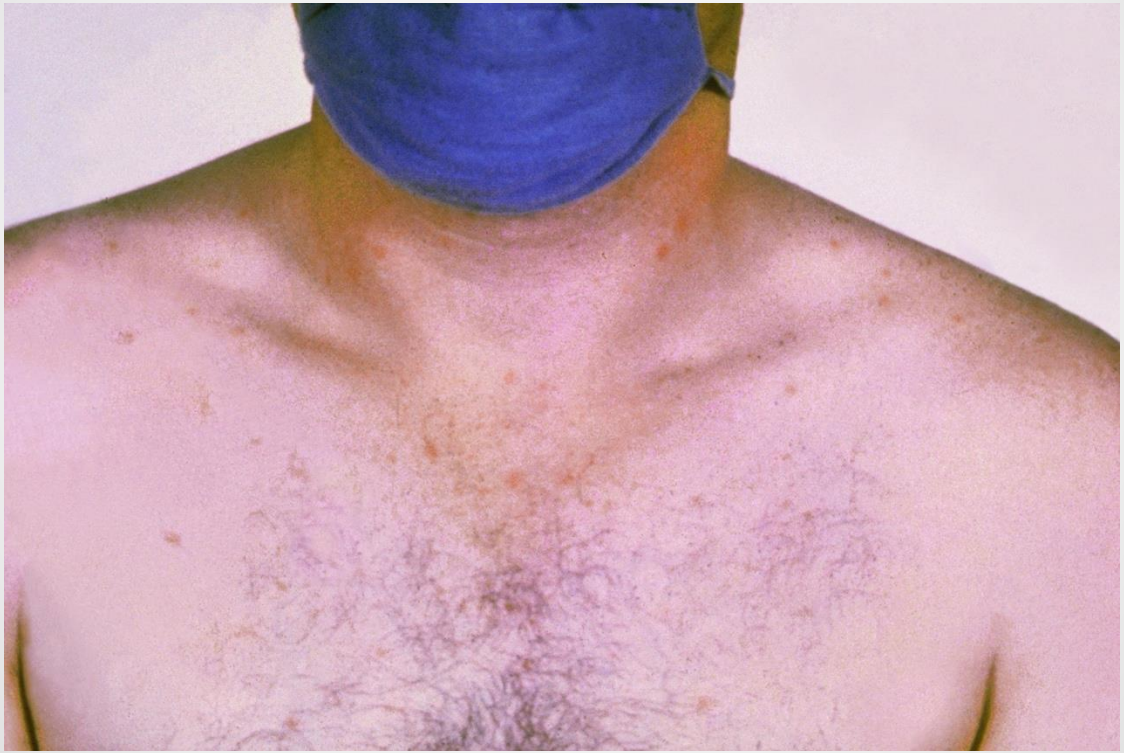
- Hepatomegally (malaria, TB, hepatitis, schisto, hepatoma, liver abscess)
- Splenomegally (malaria, typhoid, leishmaniasis, HIV, mono, lymphoma, leukemia, portal HTN, disseminated TB, brucellosis)
- Ascities (tap)
- Joint effusions (tap)


Put Some
Skin in the Game!

WHAT DOES THIS SUGGEST?



WHAT IS THIS FINDING?



SKIN EXAM

- Inspect mouth for candidiasis (HIV), Koplick spots (measles), and pharyngitis
- Rash (viral exanthems, meningococcal patechiae)
- Eschar (tick-borne rickettsia infection)
- Anesthetic patches with pigmentary changes (leprosy)
- Skin signs for cellulitis

WHAT CLUES CAN BE GLEANED FROM LAB & IMAGING?

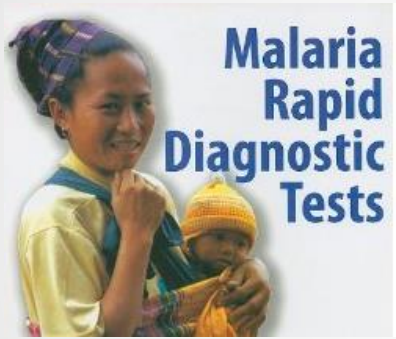
LAB & IMAGING

- Malaria smears and/or rapid test in malaria areas
- Renal functions (sepsis, severe malaria)
- Liver functions (viral hepatitis)
- ESR or CRP (general assessment, SLE)
- Acute & convalescent serum for retrospective diagnosis
- Ultrasound for liver abscess, splenomegally

LAB & IMAGING

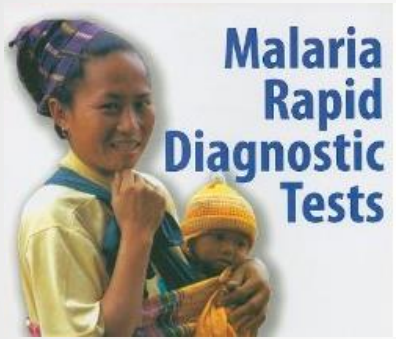
- CXR (TB, pneumonia)
- Blood cultures (sepsis, typhoid)
- UA (bacteria infection, schistosomiasis)
- Stool O & P
- Sputum AFB
- Lumbar puncture
- HIV and hepatitis ab tests
- Syphilis serology
- Genital swab for micro

APPROPRIATE USES OF TECHNOLOGY



For what tropical febrile diseases are rapid diagnostic tests available?

APPROPRIATE USES OF TECHNOLOGY



Rapid diagnostic tests for leptospirosis, syphilis, malaria, visceral leishmaniasis, typhoid, trypanosoma, and more


MISSION
Science with a Mission
Hepatitis B test - 10 strips
Expires: Feb 2017
Not for use in the U.S.
MISSION
Science with a Mission
Typhoid test - 10 strips
Expires: Jan 2018
Not for use in the U.S.

WHAT PRINCIPLES CAN BE USED TO DETERMINE WHETHER A TECHNOLOGY IS APPROPRIATE OR NOT?

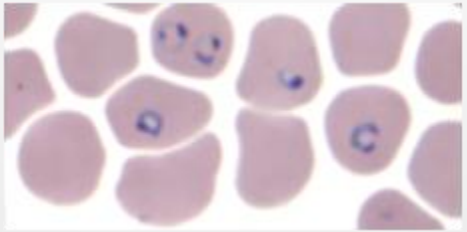
IS IT RELIABLE?

IS IT SUSTAINABLE?

IS IT ACCEPTABLE?

TROPICAL FEVER EVALUATION GRID

- Based on timeline, malaria smears and WBC count and differential
- Omitted are those conditions with obvious localizing signs, such as pyogenic arthritis
- Includes only more common causes



TROPICAL FEVER EVALUATION GRID

Common causes & fever < two weeks:

- Negative malaria smears
- Neutrophilia: pyogenic infections, leptospiral infections, amebic liver abscess, relapsing fevers (*Borrelia*)
- No neutrophilia: viral infections, rickettsial infections, typhoid

TROPICAL FEVER EVALUATION GRID

Common causes & fever > two weeks:

- Negative malaria smears
- *Neutrophilia*: sepsis, amebic liver abscess, cholangitis, relapsing fever, erythema nodosum leprosum

TROPICAL FEVER EVALUATION GRID

Common causes & fever > two weeks:

- Negative malaria smears
- *Eosinophilia*: invasive hepatic schistosomiasis (*S. mansoni*), invasive *Fasciola hepatica* infection, acute exacerbations of lymphatic filariasis (*Wuchereria bancrofti*), visceral larva migrans (*Toxocara canis*)

TROPICAL FEVER EVALUATION GRID

Common causes & fever > two weeks:

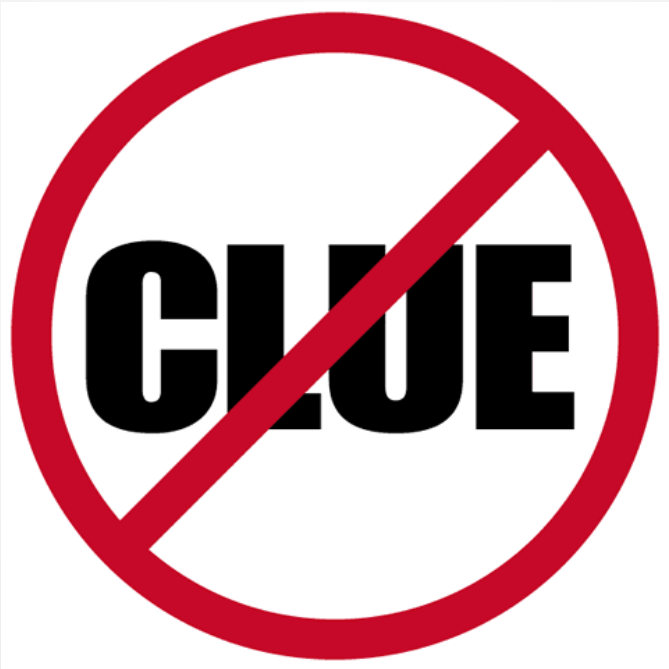
- Negative malaria smears
- *Neutropenia*: malaria, disseminated TB, visceral leishmaniasis, brucellosis, influenza, dengue, yellow fever

TROPICAL FEVER EVALUATION GRID

Common causes & fever > two weeks:

- Negative malaria smears
- *Normal WBC*: HIV, localized TB, brucellosis, secondary syphilis, trypansomiasis, toxoplasmosis, endocarditis

WHAT IS THE NATURAL HISTORY OF TROPICAL FEVERS?



NATURAL HISTORY OF TROPICAL FEVERS

At least 50% of adults and older children with genuine fever will have no cause identified and fever will resolve spontaneously in a few days.

BUT REMAIN VIGILANT!

If the cause is not immediately apparent, it may become so in days.

WHEN SHOULD EMPIRICAL TREATMENT BE INITIATED?

WHEN SHOULD EMPIRICAL TREATMENT BE INITIATED?

- In adults it is preferable to delay anti-infective treatment until diagnosis is made
- It is poor practice to treat malaria empirically unless no diagnostic test is available

WHEN SHOULD EMPIRICAL TREATMENT BE INITIATED?

- In ill appearing children with leukocytosis empirical treatment may be prudent
- Suspected sepsis or meningitis should be treated immediately
- Severe pharyngitis should be treated with a low threshold given the increased frequency of post-streptococcal complications.

EMPIRICAL TREATMENT: BROAD GENERALIZATION

- In many low-resource, tropical regions malaria is the most common cause of febrile illness.
- If malaria treatment fails, consideration is next given to typhoid fever.
- If typhoid treatment fails, consideration is then given to tuberculosis

Scenario 2

LAB RESULTS

Malaria Test: Negative

WBC 15,500
Segs 67, Lymphs 15, Eos 18

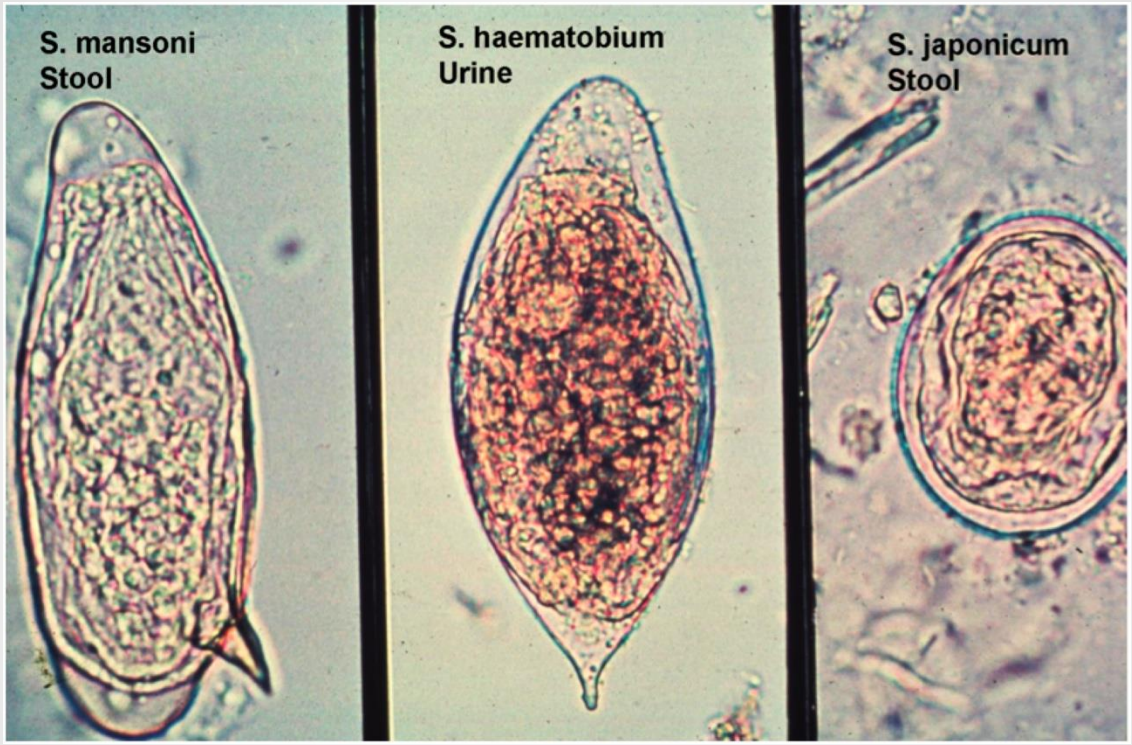
WHAT DO YOU KNOW ABOUT HEPATIC SCHISTOSOMIASIS?

SCHISTO BACKGROUND

- Schistosomes are trematodes (flatworms) that contaminate freshwater by infected persons. *S. mansoni* and *S. japonicum* ultimately reside in the intestine and most disease manifestations are hepatic.
- Schistosomiasis is most common in communities with poor sanitation. The prevalence of schistosomiasis is some 200 million people worldwide. In terms of morbidity, this disease is second only to malaria as the most dangerous parasitic disease.

SCHISTO SIGNS & SYMPTOMS

- Most infected persons in endemic areas are asymptomatic. Infection may manifest as skin rash and itching, fever, cough, muscle aches, headache, diarrhea, and hepatosplenomegaly.
- Chronic schistosomiasis from *S. mansoni* and *S. japonicum* may cause weight loss, anorexia, melena, jaundice, hepatosplenomegaly, intestinal ulceration and polyposis, portal hypertension, and liver failure.
- Diagnosis of schistosomiasis is usually made by identification of ova in feces, tissue or urine.



SCHISTOSOME EGGS (OVA)

QUESTION

All are true concerning schistosomiasis of the GI tract are true EXCEPT which ONE?

A. Persons infected with *S. mansoni commonly* present with clinical symptoms that include rapid onset lower gastrointestinal bleeding.

B. People with *S. haematobium* infection usually have a history of fresh water exposure.

C Humans are infected by free-swimming *Schistosoma* cercariae (larvae) that have developed in snails.

D. *S. mansoni* and *S. japonicum* reside in the intestine and primarily cause hepatic disease.

ANSWER

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TROPICAL FEVER EVALUATION: ONE OF CLINICAL MEDICINE'S GREATEST CHALLENGES!

EQUIP YOURSELF TO BETTER SERVE FORGOTTEN PEOPLE

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