

Travel Medicine: Prevention Goes International

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Disclosure

- Dr. Munzing has no relevant financial interests to disclose



Tim Munzing, M.D.

- ❑ Kaiser Permanente Family Medicine – >35 years
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- ❑ FM Residency PD Emeritus – 2021 to current
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- ❑ Faculty – Bernard J. Tyson KP School of Medicine
- ❑ Global Health Graduate Medical Education
- ❑ ACGME Family Medicine Accreditation Residency Review Committee – rotated off in 2021

Rwanda - 2009

- National University of Rwanda Medical School



Sweden - 2008

- Varnamo, Sweden (rural)



Ecuador – Capital and Jungle Town

Quito



Shell Mera



Egypt – Ministry of Health

- Taught Egyptian physicians learning to practice and teach primary care





Objectives

- By the end of the talk, you will be able to:
 - Discuss the scope of US travelers abroad
 - Assess the medical risk to the traveler
 - List commonly needed Immunizations
 - Explain helpful preventative treatments
 - List travel medicine related website resources

Awareness Gap

- Most are not aware of the potential health and other risks – may miss preventative opportunities
- Awareness Gaps
 - Patients
 - Physicians
 - Travel agents



Globalization of health and safety

□ Affects:

- Health of local populations
- Health determinants
- Safety and Security

□ Results:

- Global impacts
- Infectious disease spread
 - Pathogens travel as fast as transportation does, crosses borders easily (e.g. COVID)



Americans on the move (pre-COVID)

- 20 million will travel in a typical year
- 100,000 travel to the developing world
 - 50,000 will get ill
 - 8,000 will see a physician
 - 34% will get diarrhea
 - 5,000 will stay in bed
 - 1 will die
 - 22% of travel's deaths are from trauma

Top Cause of Deaths in Backpackers

- ❑ Road deaths – 3,200
- ❑ Murders – 2,150
- ❑ Malaria
- ❑ Food poisoning
- ❑ Falling coconuts
- ❑ Wild animal attacks
- ❑ Drug overdose
- ❑ Civil war
- ❑ STD's





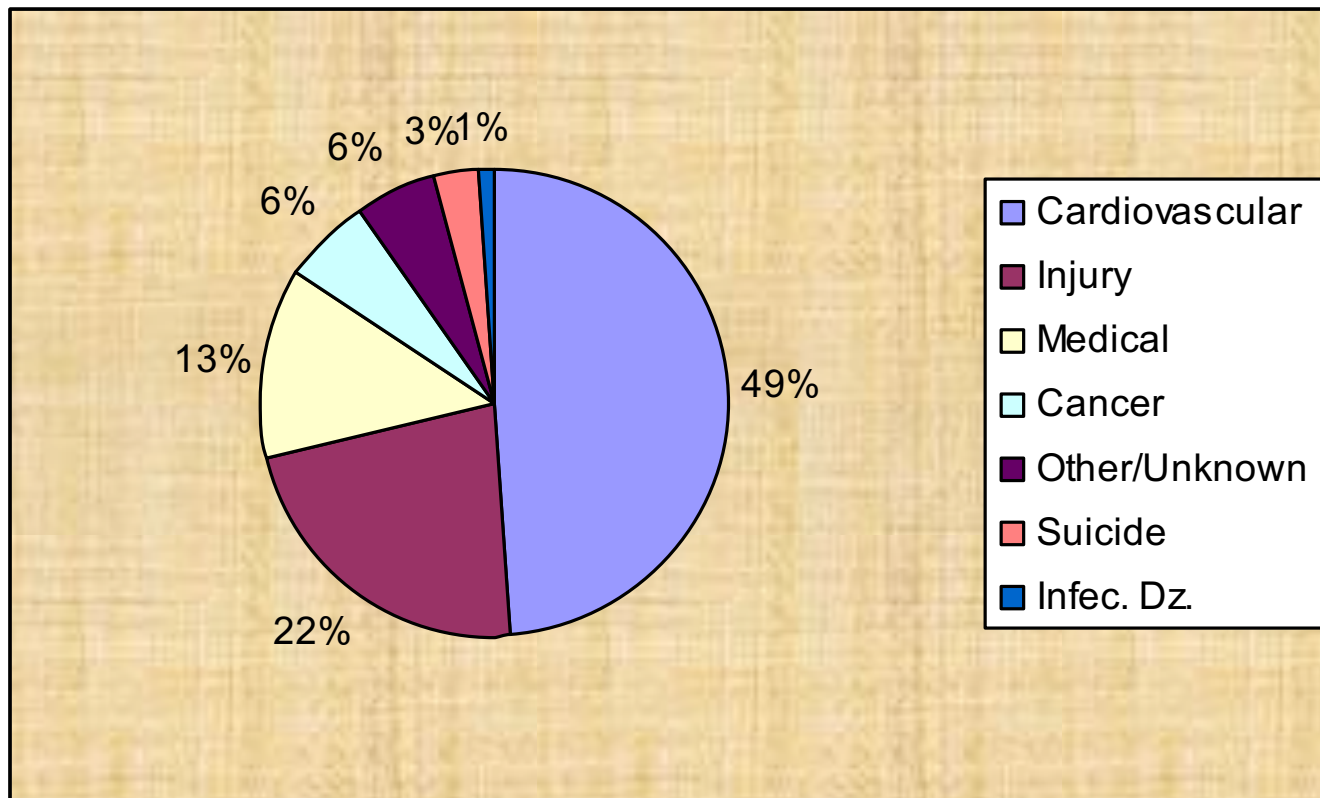
Mortality Causes in Travelers

- What is the highest cause of death in US travelers to 3rd world countries?
 - A. Tropical Diseases
 - B. Traumatic Injury
 - C. Cardiovascular Disease
 - D. Other Chronic Medical Disease

Mortality Causes in Travelers

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Causes of Mortality in Travelers





Travel Risk – Issues to Assess

- List 5 travel issues to assess in your patient coming to you for travel advice and management



Travel Risk – Issues to Assess

- Duration of travel
- Destination(s)
- Age of traveler
- Underlying health
- Rural vs urban
- Lodging type
- Preplanning of the traveler
- Activity ability

Rural vs Urban



Bhutan



Bangkok



Various Risks of Travelers

- Business
- Tourist
- Backpacker
- Elderly
- Pediatric
- Expatriate
- Exchange Student
- Sportsman/woman
- Pregnant
- Trekker
- Adventurer
- Missionary
- Visiting relatives

Accommodations



Infectious Diseases in Travelers

- COVID
- Travelers diarrhea
- Hepatitis A
- Hepatitis B
- Malaria
- Typhoid
- STD's
- Cholera
- Japanese encephalitis
- Respiratory infections
- Dengue fever
- Animal bites / rabies
- Leishmaniasis
- Polio
- Meningococcal meningitis
- Schistosomiasis

Age-Appropriate Vaccines

- Which is not an age-appropriate vaccine to consider in all travelers?
 - Td or TDAP
 - Flu
 - Malaria
 - Pneumococcal
 - H1N1
 - Zostavax

Age Appropriate Vaccines

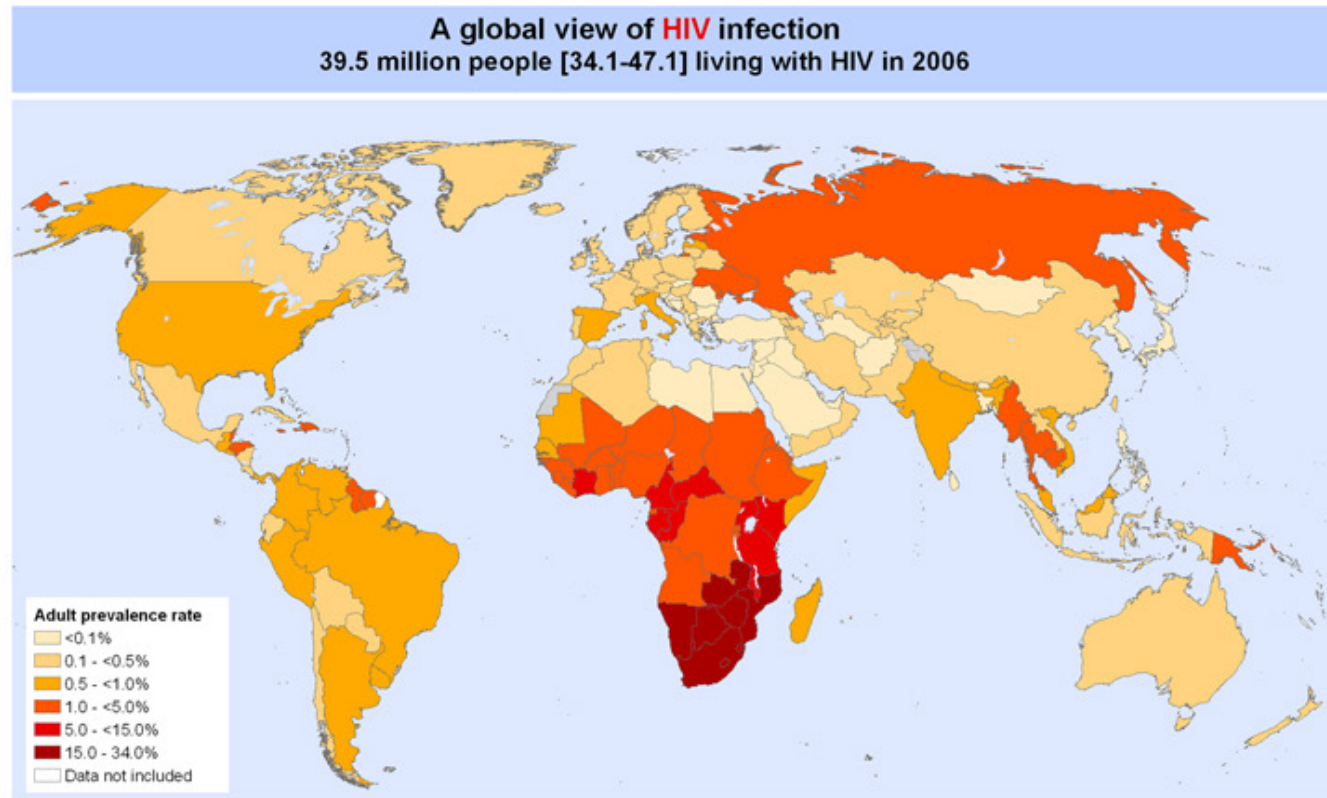
- Which is not an age appropriate vaccine to consider in all travelers?
 - Td or TDAP
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Immunizations - Routine

- Childhood vaccinations
- Age appropriate – travel or not
 - Td or Tdap
 - Flu
 - Pneumococcal
 - H1N1
 - Zostavax
 - COVID (?)



HIV and STD Exposure



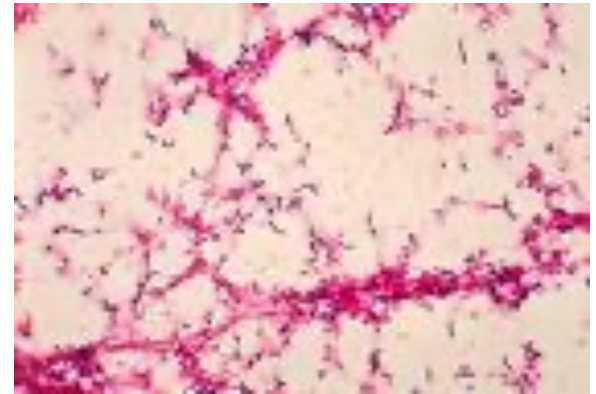
The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: WHO / UNAIDS
Map Production: Public Health Mapping and GIS
Communicable Diseases (CDS)
World Health Organization

 World Health
Organization
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Pneumococcal Vaccine

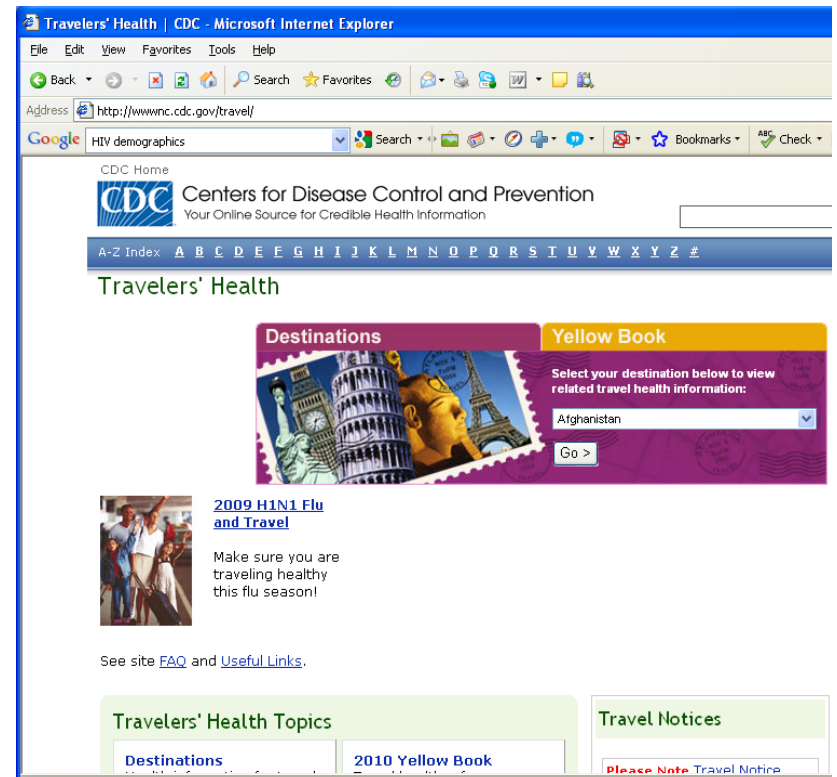
- Especially Important
 - Chronic illness
 - Over age 65
 - Cardiovascular Disease
 - Diabetes



Recommended Vaccines by Country

□ Centers for Disease Control and Prevention Website:

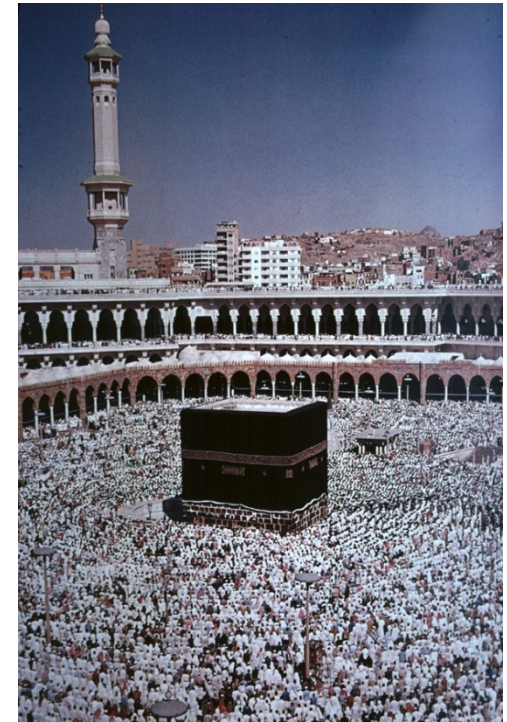
■ www.cdc.gov/travel



The screenshot shows the CDC Travelers' Health website in Microsoft Internet Explorer. The browser's address bar displays <http://www.cdc.gov/travel/>. The page header includes the CDC logo and the text "Centers for Disease Control and Prevention Your Online Source for Credible Health Information". A navigation menu lists letters A-Z. The main content area features a "Travelers' Health" section with a "Destinations" banner showing the Statue of Liberty, the Leaning Tower of Pisa, and the Eiffel Tower. To the right is a "Yellow Book" section with a dropdown menu set to "Afghanistan" and a "Go >" button. Below this is a "2009 H1N1 Flu and Travel" section with a photo of people and the text "Make sure you are traveling healthy this flu season!". At the bottom, there are sections for "Travelers' Health Topics" (with a link to "Destinations") and "Travel Notices" (with a link to "2010 Yellow Book").

Required (to enter countries)

- Yellow fever
 - By WHO
- Meningococcal meningitis
 - Saudi Arabia – required for Mecca pilgrimage
- No longer required
 - Cholera
 - Smallpox





Which of the following is not recommended for all travelers?

- A. Hepatitis A
- B. Hepatitis B
- C. MMR (x 2 after 1957)
- D. Typhoid
- E. Polio
- F. Varicella (if no immunity)



Which of the following is not recommended for all travelers?

- A. Hepatitis A
- B. Hepatitis B
- C. MMR (x 2 after 1957)
- D. ⇒ Typhoid**
- E. Polio
- F. Varicella (if no immunity)

Vaccines – Recommended Strongly for All

- Hepatitis A
- Hepatitis B
- MMR (x 2 after 1957)
- Polio
- Varicella (if no immunity)

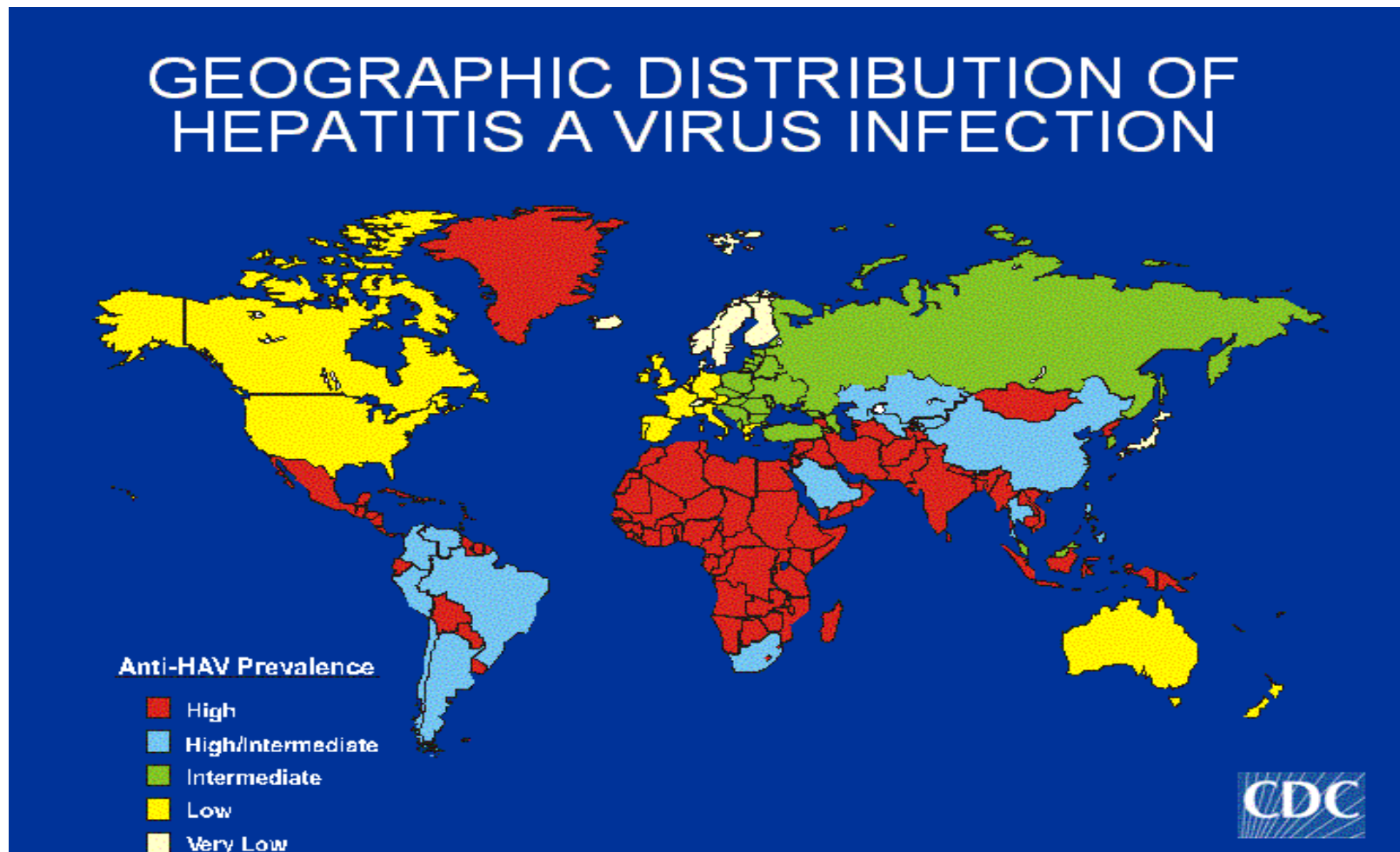


Vaccines Recommended: Location Specific

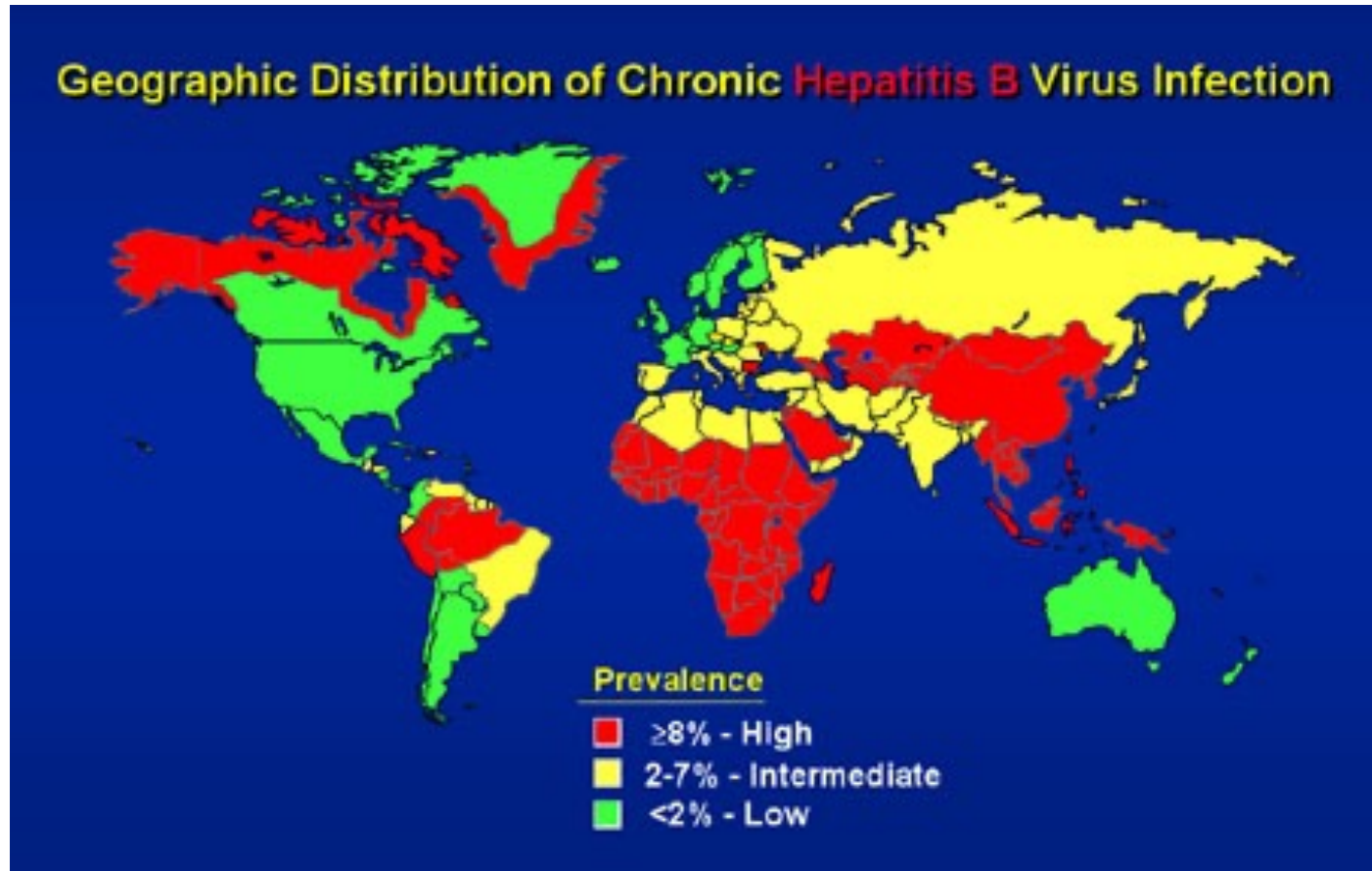
- ❑ Typhoid – 2 types available
- ❑ Meningococcal meningitis
- ❑ Cholera
- ❑ Yellow fever
- ❑ Rabies
- ❑ Japanese encephalitis
- ❑ Tick born encephalitis



Hepatitis A Distribution



Chronic Hepatitis B Distribution

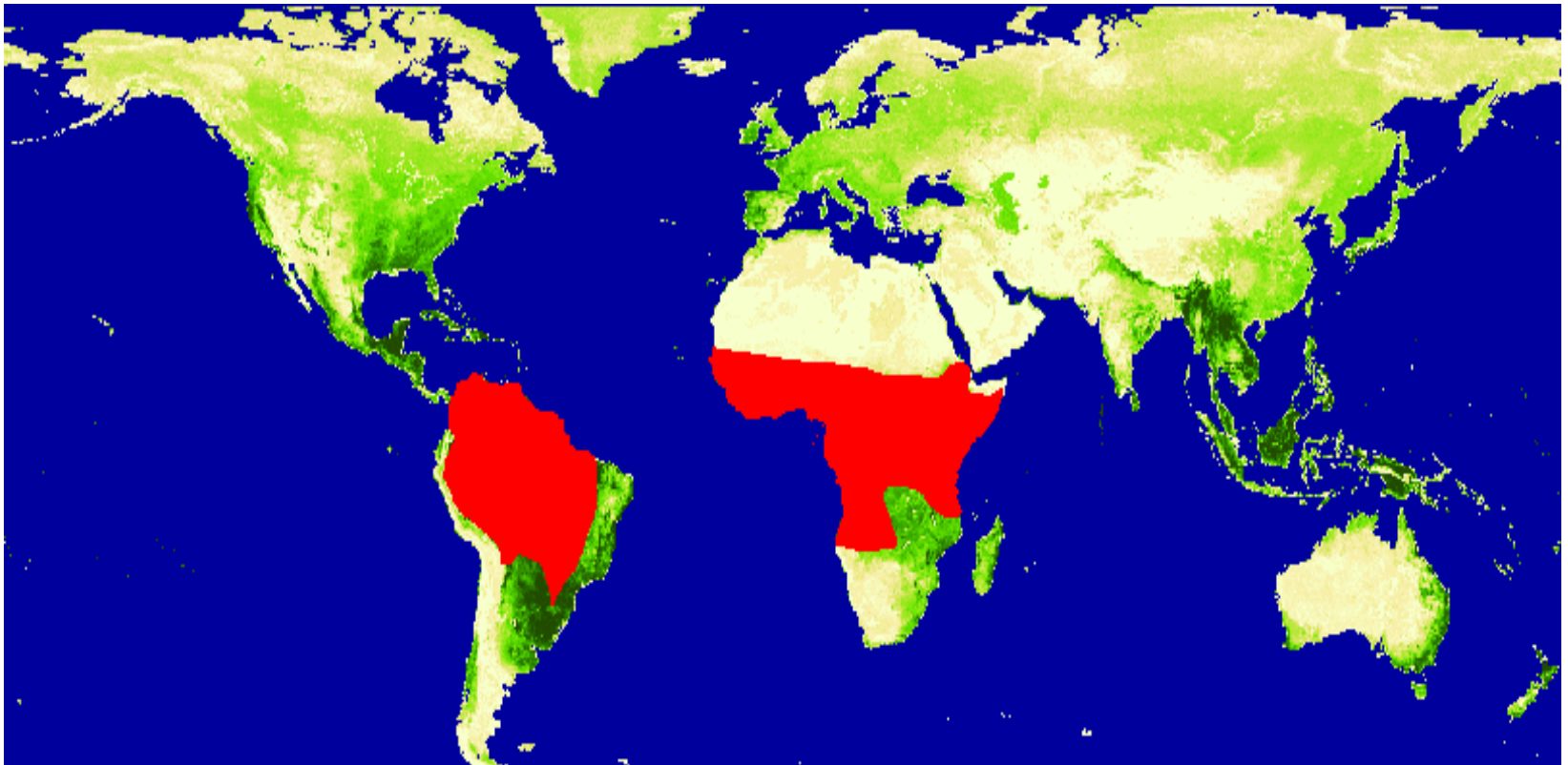


Hepatitis B

- Est. 2 billion people worldwide have been infected HBV at some time in their lives.
- 350 million of these people have a chronic infection which puts them at risk of death from liver cancer.
- Liver cancer and cirrhosis of the liver cause about 1 million deaths per year worldwide
- Est. 1.25 million Americans have chronic Hepatitis B
- Est. 5000 Americans die every year from Hepatitis B
- Most common in Sub-Saharan Africa and Middle East

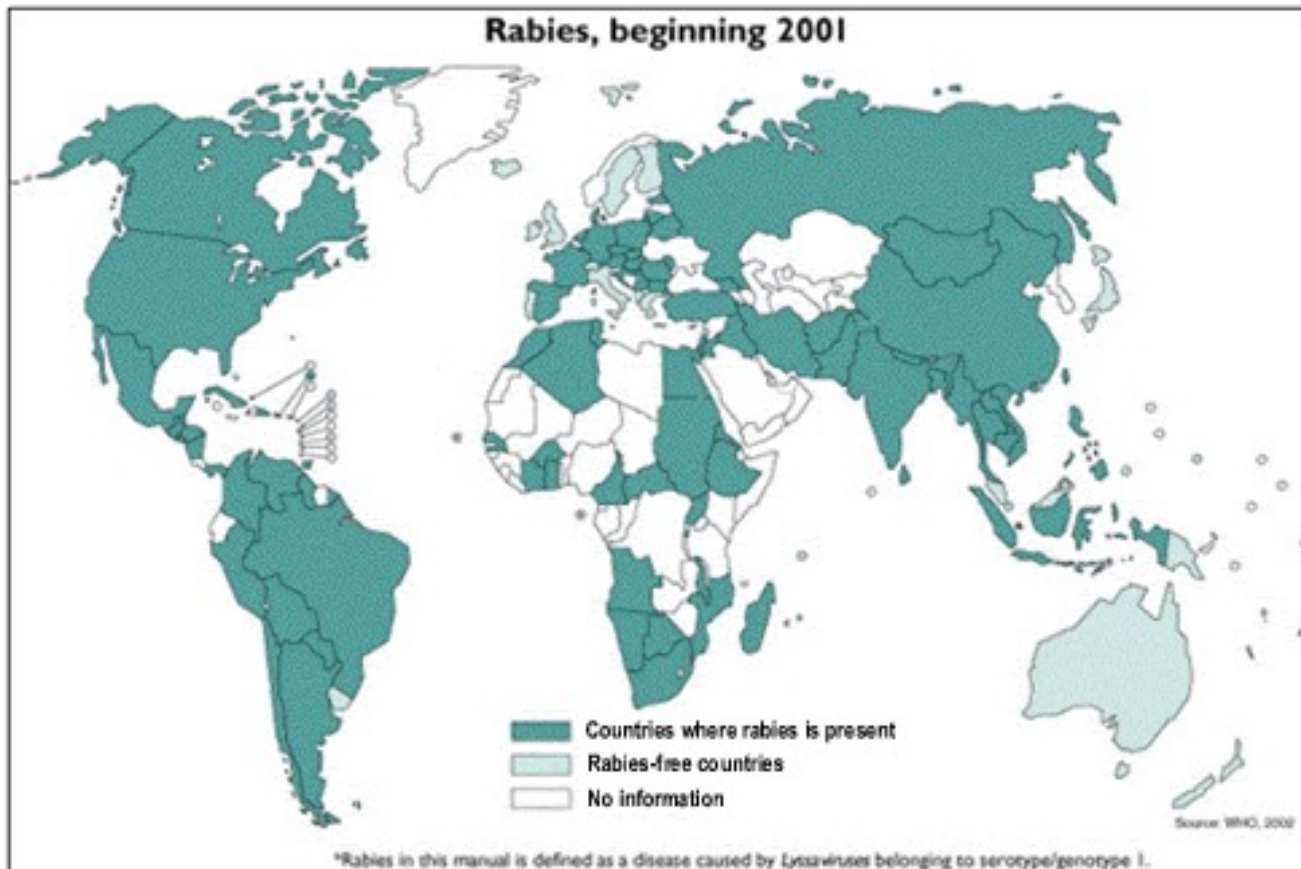
□ Hepatitis B." *Chiron* 2009

Yellow Fever Distribution



geo.arc.nasa.gov

Rabies

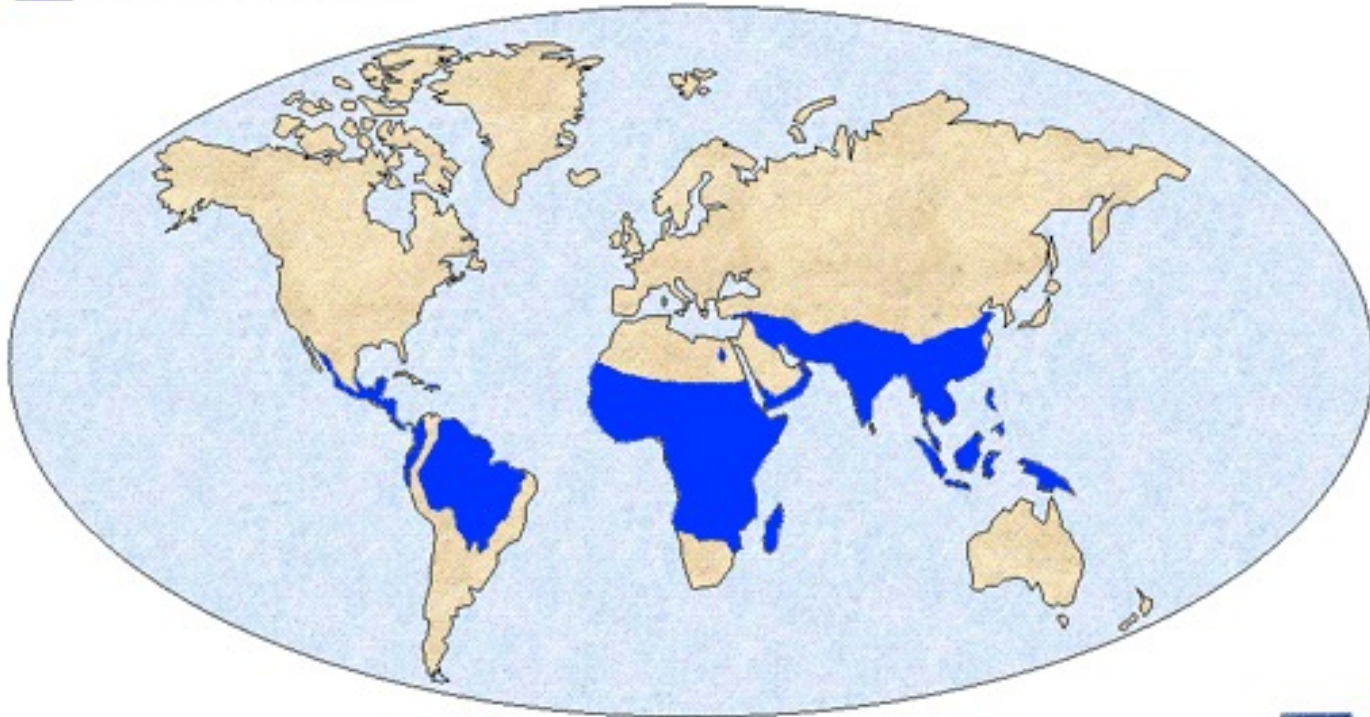


Malaria

- Mosquito borne
- Fever, flu-like sx, chills
- 350 – 500 million cases annually
- >1 million deaths worldwide annually
- Majority of deaths – sub-Saharan Africa
- Higher risk – pregnant women, young children
 - CDC

Malaria Distribution

 Distribution of Malaria





Malaria Risks: Which is incorrect?

- A. Rural > urban
- B. Higher elevations worse than lower elevations
- C. Higher temp and rainfall worse
- D. Nighttime worse than daytime
- E. *P. falciparum* more severe and deadly than other forms

Malaria Risks: Which is incorrect?

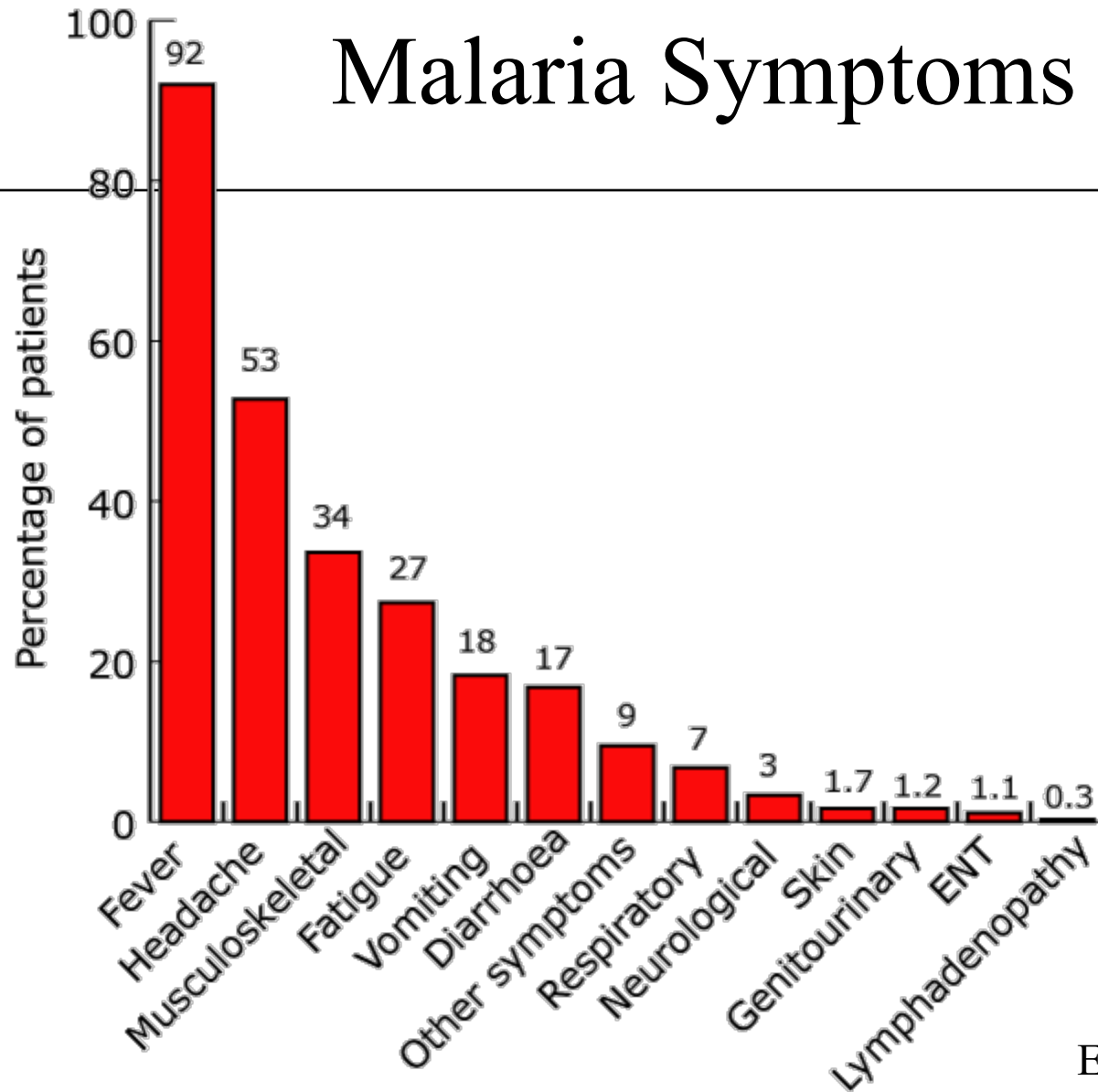
- A. Rural > urban
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- E. *P. falciparum* more severe and deadly than other forms



Malaria Risks

- Rural > urban
- Lower elevations
- Higher temp and rainfall worse
- Nighttime worse
- *P. falciparum* more severe and deadly

Malaria Symptoms



Malaria – Travelers Risk

- 10,000 to 30,000 travelers from industrialized countries contract malaria annually
- Top life-threatening infection for international travelers
- International traveler malaria mortality risk:
 - >1-4% Overall
 - > 6% >40 yrs
 - > 30% >70 yrs

Mefloquine Resistant Malaria



Protection Measures

- Insect repellents
 - DEET
 - Permethrine
- Bed mosquito nets
- Long sleeves
- Window screens





Prevent Malaria - Medications

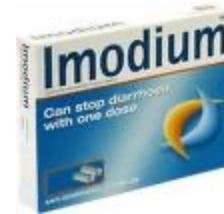
- ❑ Chloroquine – weekly – more psoriasis
- ❑ Mefloquine (Lariam) – weekly
- ❑ Atovaquone / Proguanil (Malarone) – daily
- ❑ Doxycycline

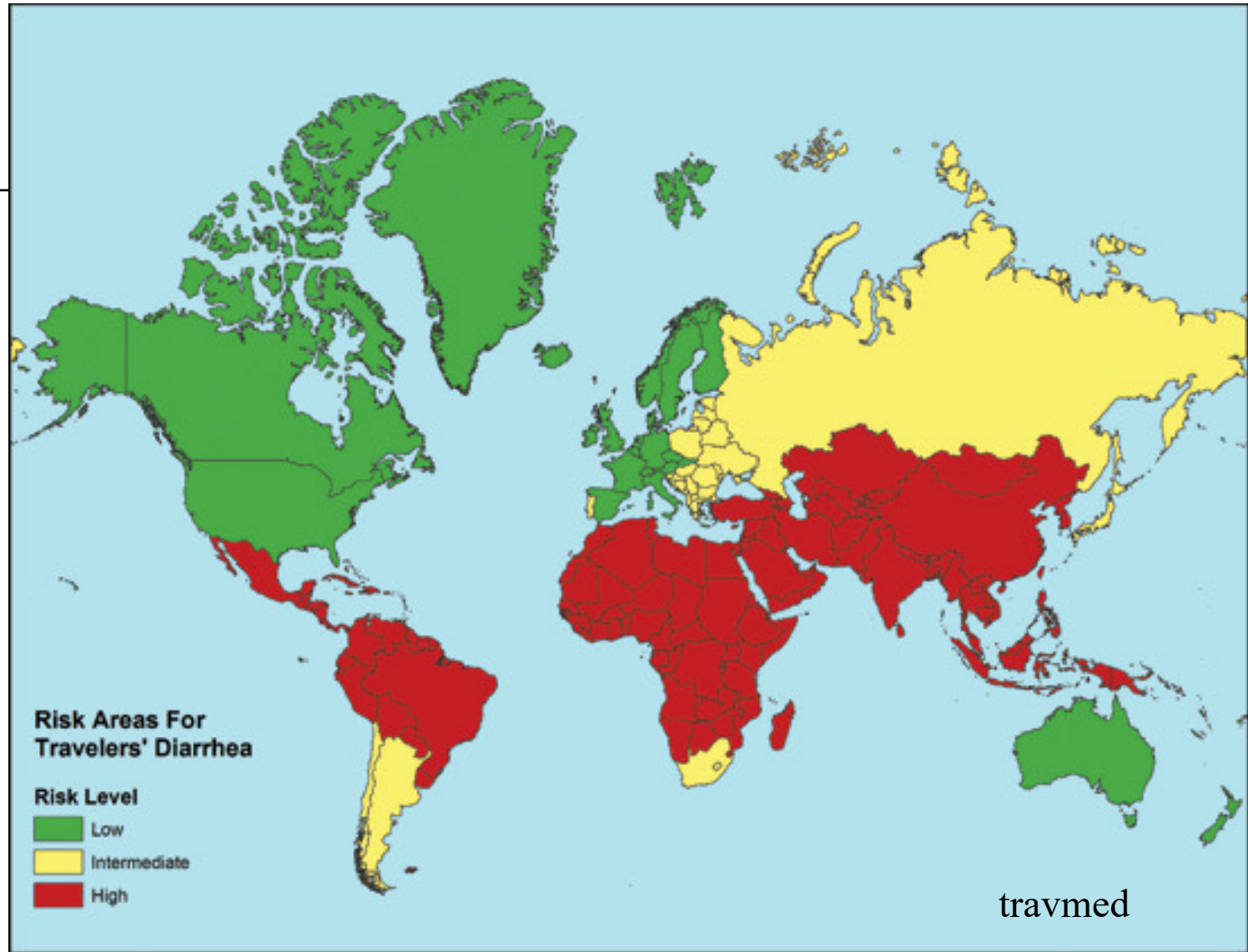
Traveler's Diarrhea: Infectious Causes

- Bacterial (80 – 85%)
 - Enterotoxigenic E Coli
 - Campylobacter jejuni
 - Salmonella
 - Shigella
 - Vibrio cholerae
 - Pleomonia shigelloids
 - Aeromonas
- Viral (5%)
 - Rotavirus
 - Norovirus
- Parasitic (10%)
 - Entemeba Histolytica
 - Cryptosporidium
 - Giardia Lambia
 - Cyclospora
- Many w/o specific diagnosed etiology

Treatment of Travel's Diarrhea

- ❑ Fluid and salts replacement – WHO oral rehydration solution
- ❑ Imodium, Pepto-bismol, or kapectate – use prior to antibiotics
- ❑ Antibiotics





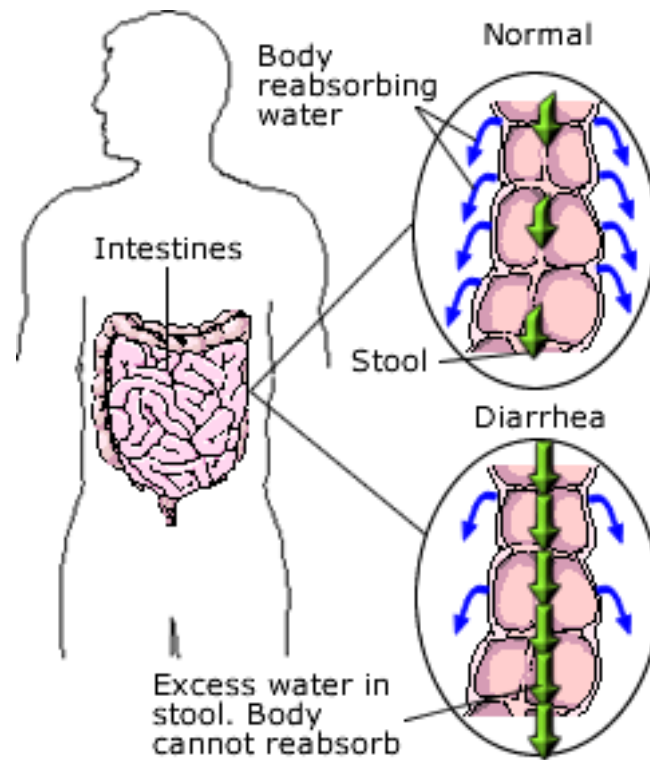
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Prevention of Travel's Diarrhea

- Avoid contaminated food, water, and ice
- Hand hygiene
- Chemoprophylaxis
 - Critical trip – use premedication
 - Adventurous eating – Bismuth subsalicylate
 - Usual travel – No pre-medication, use self tx if needed
- Rifaximin (Xifaxin) – non-absorbed

Traveler's Diarrhea Antibiotic Prevention

- ❑ Ciprofloxacin
- ❑ Levofloxacin
- ❑ Azithromycin
- ❑ Moxifloxacin
- ❑ Ofloxacin
- ❑ Rifaximin



Traveler's Diarrhea Self Treatment

- Quinolone +/- loperamide
 - 3-day treatment vs single dose
- Azithromycin
 - Alternative where Campylobacter predominates (SE Asia)
 - OK in pregnancy and young children
- Rifaximin –
 - Where E Coli predominates – no fever or stool blood
 - Three-day tid regimen

High Altitude Sickness: Altitudes of Key Tourist Sites

□ Africa

- Nairobi (Kenya) 4,800 feet
- Johannesburg (S.A.) 5,100
- Addis Ababa (Ethiopia) 7,500

□ Asia

- Kathmandu (Nepal) 3,600
- Sirinagar (India) 5,400
- Lhasa (Tibet) 12,500



High Altitude Sickness: Altitudes of Key Tourist Sites

□ The Americas

■ Mexico City (Mexico)	6,900 feet
■ Bogota (Columbia)	7,800
■ Quito (Ecuador)	8,500
■ Cuzco (Peru)	11,000

□ Mountains

■ Everest Base Camp	17,600
■ Mt. Kilimanjaro	19,000
■ Lake Titicaca	13,000





High Altitude Sickness

- As elevation increases on land or air, air thins
- Too rapid ascent – breathing difficult
- Acute Mountain Sickness (AMS)
 - Marked decrease in exercise tolerance
 - Lassitude
 - Headache and nausea
 - Infants – irritable with poor appetite

High Altitude Sickness

- Continuing to climbmay worsen to:
 - HAPE – high altitude pulmonary edema
 - HACE – high altitude cerebral edema



Altitude and AMS

- 4,000 – 6,000 feet: Mild symptoms
- 9,000 – 10,000 feet: Serious symptoms
- Symptom intensity may depend on:
 - Altitude
 - Rate of ascent
 - Amount of exertion



Altitude Mountain Sickness

- Approximately what percentage of travelers are affected by AMS at 10,000 feet elevation?
 - A. 10%
 - B. 18%
 - C. 25%
 - D. 35%
 - E. 50%

Altitude Mountain Sickness

- Approximately what percentage of travelers are affected by AMS at 10,000 feet elevation?
 - A. 10%
 - B. 18%
 - C. ⇒25%
 - D. 35%
 - E. 50%

AMS in Travelers

- At 10,000 feet – 25% of travelers experience AMS
- Affects 50% of trekkers on popular high-altitude routes in Nepal
- 2-3 deaths annually



AMS Prevention

□ Acclimatization

- Gradual ascent, above 9,000 feet – about 1,000 per day
- Higher altitudes – slower the ascent
- 6 – 48 hours for acclimatization

□ Medications

- Acetazolamide (Diamox) – not approved for children – Possible side effects: parasthesias, taste changes
- Dexamethasone

AMS Treatment

- ❑ Descent to lower altitudes
- ❑ Oxygen
- ❑ Pressurized bag



Travel Medicine Summary

- ❑ Assess risk of travel
- ❑ Food and water precautions
- ❑ Environmental precautions
- ❑ Immunizations
- ❑ Sun block
- ❑ Insect repellent
- ❑ Accident avoidance





Travel Medicine Summary

- Take brief medical history on the trip including medication list
- Take an extra pair of glasses or contacts
- Take extra medications including documentation of controlled medications

Travel Websites & Resources

- ❑ CDC – www.cdc.gov/travel - basic and vaccination information
- ❑ International SOS – www.internationalsos.com – Travel insurance, security alerts, overseas clinics
- ❑ US State Dept. – www.travel.state.gov – locating consular offices, travel advisories
- ❑ International Soc. Of Travel Medicine – www.istm.org
- ❑ The Pretravel Consultaton. American Family Physician. Sept. 15, 2009