

Immunization Webinar Series

# Travel Vaccinations

Jennifer Burns, APN

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# HELLO!

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## Jen Burns, APN

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# Agenda



Understand worldwide  
risks of disease in the  
pediatric traveler

Describe general  
principles of travel clinic

Review routine  
immunizations needed for  
travel based

Identify other travel  
precautions for traveler  
and provider

# Pediatric Travel

- ▶ 900 million people traveled internationally in 2022.
- ▶ An estimated 4% of these people are children.
- ▶ Approximately 8% of these travelers need to seek medical attention while traveling.



# General Principles of Travel Clinic



- ▶ Most insurances do not offer or have limited coverage for travel vaccines.
- ▶ The most common thing not covered is the professional fee for counseling.
- ▶ Travel clinic is a fee for service. Payment is required at the end of the visit.

# General Principles of Travel Clinic



- ▶ Ideally the travel visit should be the second reservation after the flight arrangements.
- ▶ Review itinerary
  - ▶ Destinations: purpose, time, duration and accommodations
  - ▶ Potential exposure to insects and animals
  - ▶ Immunization Records
  - ▶ Vaccines
    - ◆ Recommended VS Required



# General Principles of Travel Clinic

- ▶ Routine Immunizations
- ▶ Malaria Prophylaxis
- ▶ Protective Measures
- ▶ Traveler's Diarrhea
  - ▶ Preventive measures
- ▶ Pediatric Travel Kit
- ▶ Other important documents and items



**Table 1** Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2023

These recommendations must be read with the notes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars. To determine minimum intervals between doses, see the catch-up schedule (Table 2).

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19–23 mos	2–3 yrs	4–6 yrs	7–10 yrs	11–12 yrs	13–15 yrs	16 yrs	17–18 yrs
Hepatitis B (HepB)	1 <sup>st</sup> dose	← 2 <sup>nd</sup> dose →			← 3 <sup>rd</sup> dose →												
Rotavirus (RV): RV1 (2-dose series), RV5 (3-dose series)			1 <sup>st</sup> dose	2 <sup>nd</sup> dose	See Notes												
Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs)			1 <sup>st</sup> dose	2 <sup>nd</sup> dose	3 <sup>rd</sup> dose			← 4 <sup>th</sup> dose →				5 <sup>th</sup> dose					
<i>Haemophilus influenzae</i> type b (Hib)			1 <sup>st</sup> dose	2 <sup>nd</sup> dose	See Notes		← 3 <sup>rd</sup> or 4 <sup>th</sup> dose, See Notes →										
Pneumococcal conjugate (PCV13, PCV15)			1 <sup>st</sup> dose	2 <sup>nd</sup> dose	3 <sup>rd</sup> dose		← 4 <sup>th</sup> dose →										
Inactivated poliovirus (IPV <18 yrs)			1 <sup>st</sup> dose	2 <sup>nd</sup> dose	← 3 <sup>rd</sup> dose →							4 <sup>th</sup> dose					See Notes
COVID-19 (1vCOV-mRNA, 2vCOV-mRNA, 1vCOV-aPS)					2- or 3- dose primary series and booster (See Notes)												
Influenza (IIV4)					Annual vaccination 1 or 2 doses								Annual vaccination 1 dose only				
or Influenza (LAIV4)												Annual vaccination 1 or 2 doses	Annual vaccination 1 dose only				
Measles, mumps, rubella (MMR)					See Notes	← 1 <sup>st</sup> dose →						2 <sup>nd</sup> dose					
Varicella (VAR)						← 1 <sup>st</sup> dose →						2 <sup>nd</sup> dose					
Hepatitis A (HepA)					See Notes	2-dose series, See Notes											
Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs)														1 dose			
Human papillomavirus (HPV)														See Notes			
Meningococcal (MenACWY-D ≥9 mos, MenACWY-CRM ≥2 mos, MenACWY-TT ≥2 years)			See Notes											1 <sup>st</sup> dose		2 <sup>nd</sup> dose	
Meningococcal B (MenB-4C, MenB-FHbp)																	
Pneumococcal polysaccharide (PPSV23)																	
Dengue (DEN4CYD; 9–16 yrs)															Seropositive in endemic dengue areas (See Notes)		

Range of recommended ages for all children

Range of recommended ages for catch-up vaccination

Range of recommended ages for certain high-risk groups

Recommended vaccination can begin in this age group

Recommended vaccination based on shared clinical decision-making

No recommendation/not applicable

Which vaccine preventable disease  
will the traveler most encounter?

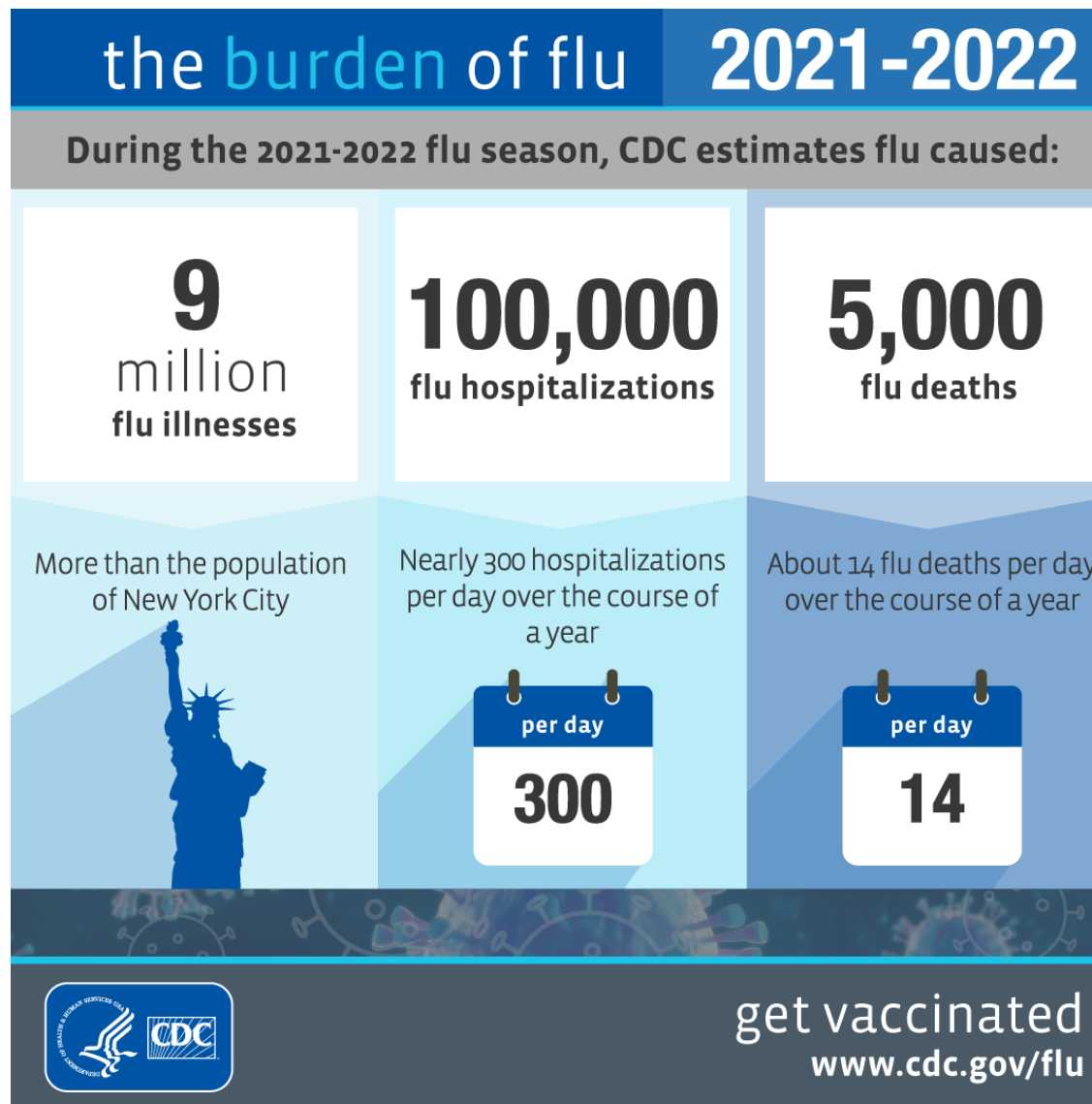
**HEPATITIS A**

**MENINGOCOCCAL DISEASE**

**VARICELLA**

**INFLUENZA**



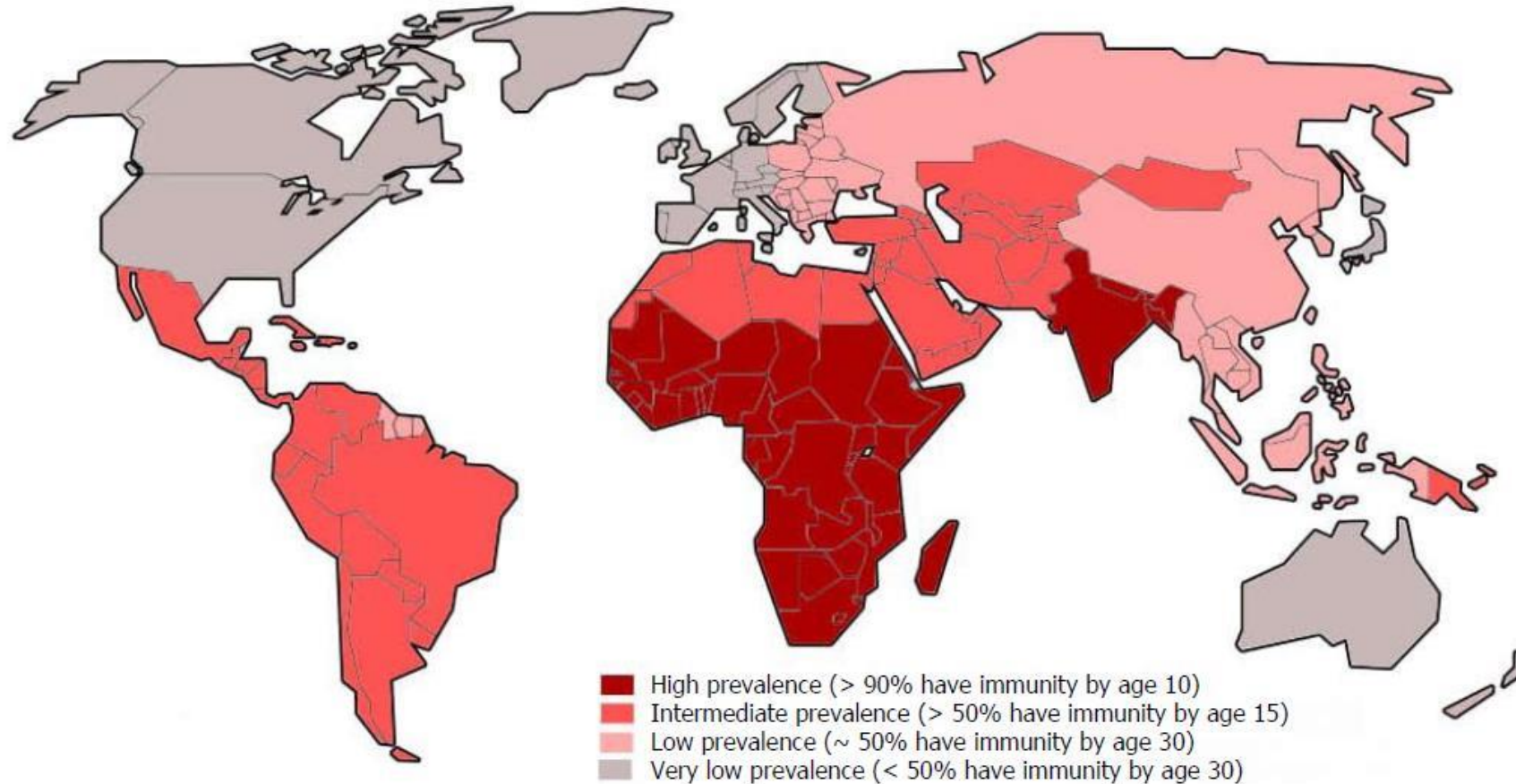


# Routine Immunizations



- ▶ Polio
  - ▶ Global eradication targeted for 2005.
  - ▶ Between 2002 to 2005, 21 countries previously polio free documented polio infections.
  - ▶ [www.polioeradication.org](http://www.polioeradication.org)
- ▶ MMR
  - ▶ More than ½ million children die of measles annually.
  - ▶ Children less than 1 year of age have the highest risk of severe disease.
  - ▶ Children 6 to 12 months of age traveling to endemic countries should receive a dose of MMR.

# World Hepatitis A Prevalence



Source: Jacobsen KH. Globalization and the Changing Epidemiology of Hepatitis A Virus. Cold Spring Harb Perspect Med 2018 Mar 2 PMID: 29500305

Prevalence of hepatitis A

# Routine Immunizations



- ▶ Varicella
  - ▶ For children with unknown varicella status, serotesting is recommended before immunization for children 5 years and older.
- ▶ Hepatitis A
  - ▶ The majority of Hep A is imported to the US from Mexico and Central America.
  - ▶ In children, Hep A causes asymptomatic or mild infection, but virus may be shed for prolonged period.
  - ▶ Immunoglobulin recommended for a child under 1 year of age.

# Routine Immunizations



- ▶ Hepatitis B
  - ▶ Children who are traveling to endemic areas should complete Hep B prior to travel.
  - ▶ Can use an accelerated schedule of 0, 1, 2 & 12 months.
- ▶ Influenza
  - ▶ Recommended for all children 6 months to 18 years of age.
  - ▶ Southern Hemisphere flu season April to September and year-round in the tropics.



# Routine Immunizations



- ▶ Meningococcal
  - ▶ Part of the routine immunization schedule for 11 to 12 y.o. adolescents.
  - ▶ Hib-Men CY is available, but only covers 2 serotypes.
  - ▶ MCV4 (Menactra™) now licensed for children 9 months to 10 years of age.
  - ▶ Meningococcal vaccinations required to Hadj in Saudi Arabia.

# Sub Sahara Meningococemia Belt

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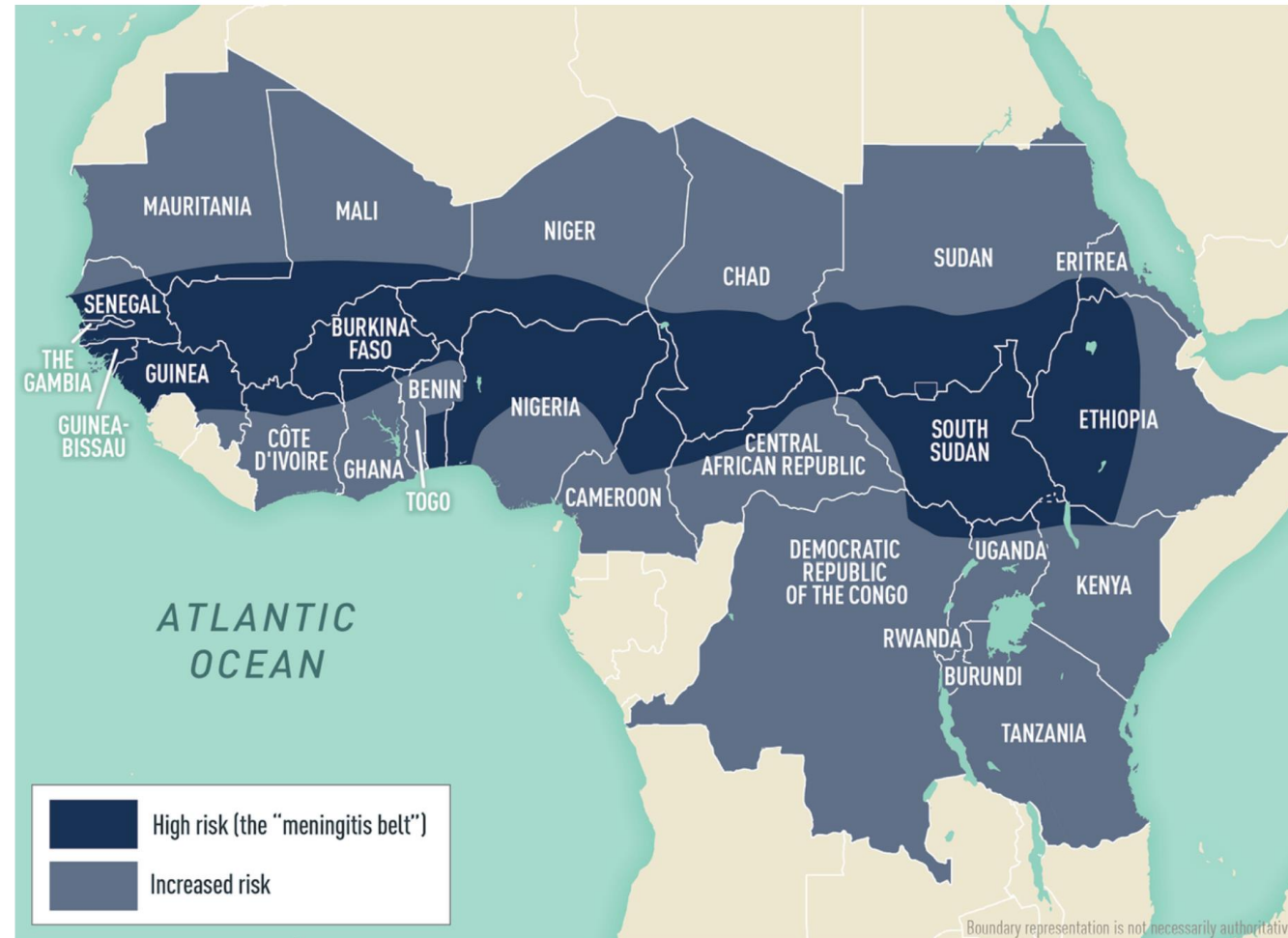
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Map 5-01 The meningitis belt & other areas at risk for meningococcal meningitis epidemics



# Vaccines Specific for Travel



Typhoid

Yellow Fever

Japanese  
Encephalitis

Rabies

BCG (Not in  
USA)

Cholera (Not  
in USA)

# Typhoid

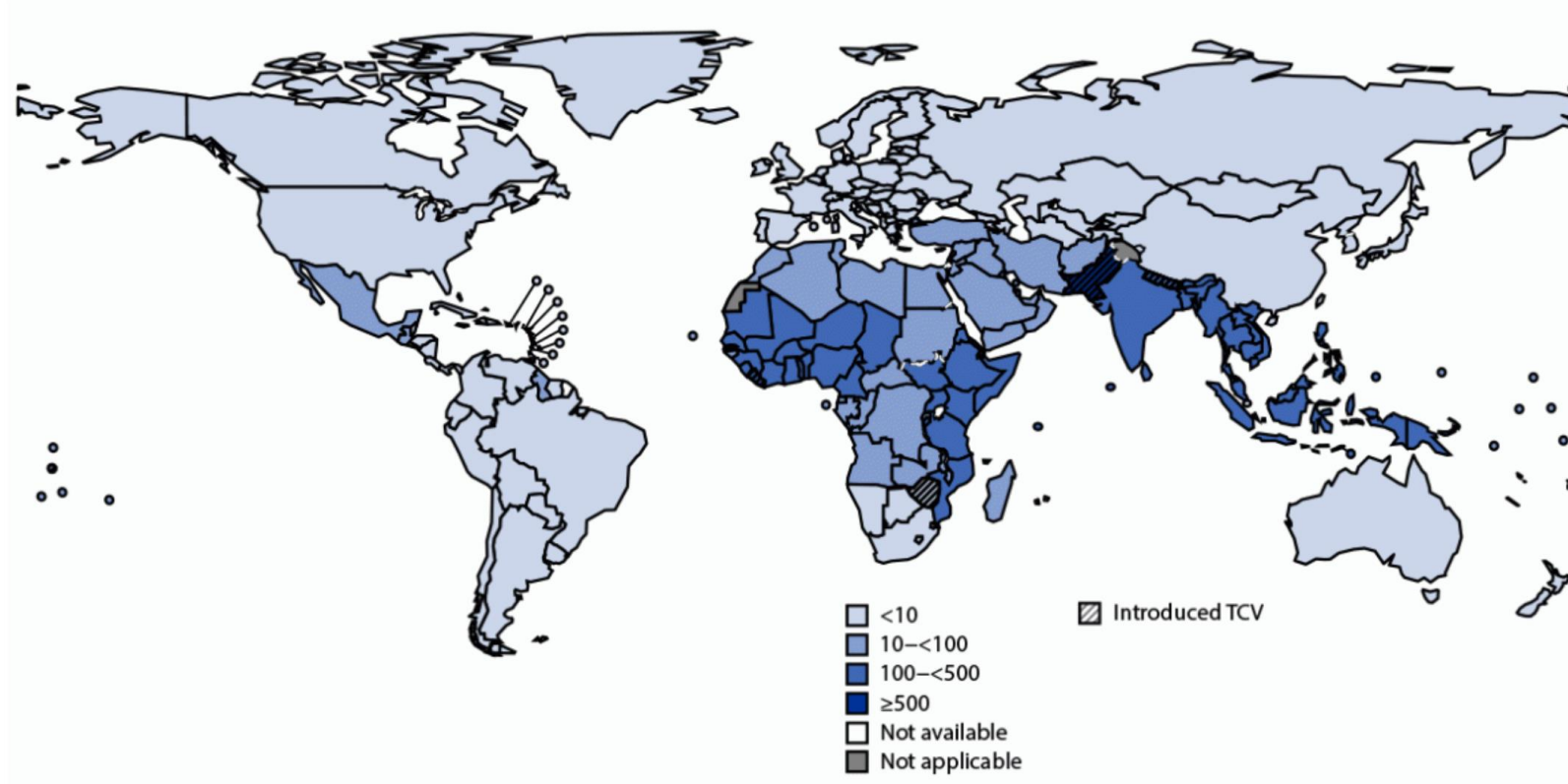


- ▶ Enteric fever caused by salmonella (*S. typhi* & *S. paratyphi*)
- ▶ Children are at risk of getting disease and becoming chronic carriers
- ▶ Areas of risk:
  - ▶ Eastern and Southern Asia, Middle East, Africa and Latin America
  - ▶ As of 2019, there is an estimated of 9 million cases of typhoid fever annually, resulting in ~110,000 deaths per year
- ▶ Types of Vaccine (70% to 80%)
  - ▶ Vivotiff or Ty21a (live attenuated)
    - ◆ Oral
  - ▶ Typhim (Capsular polysaccharide)

# Typhoid Risk Worldwide



FIGURE. Estimated national typhoid fever incidence\* and typhoid conjugate vaccine introduction† status — worldwide, 2019 and 2022



Source: Global Burden of Disease Collaborative Network, Global Burden of Disease study, 2019. <https://www.healthdata.org/gbd/gbd-2019-resources>

Cases per 100,000 cases; TCV = Typhoid Conjugate Vaccine

# Yellow Fever

- ▶ Caused by an arbovirus of the Flavus virus group.
- ▶ Human disease occurs through bites from infected mosquitoes, *Aedes aegypti*.
- ▶ Some countries require this for entry.





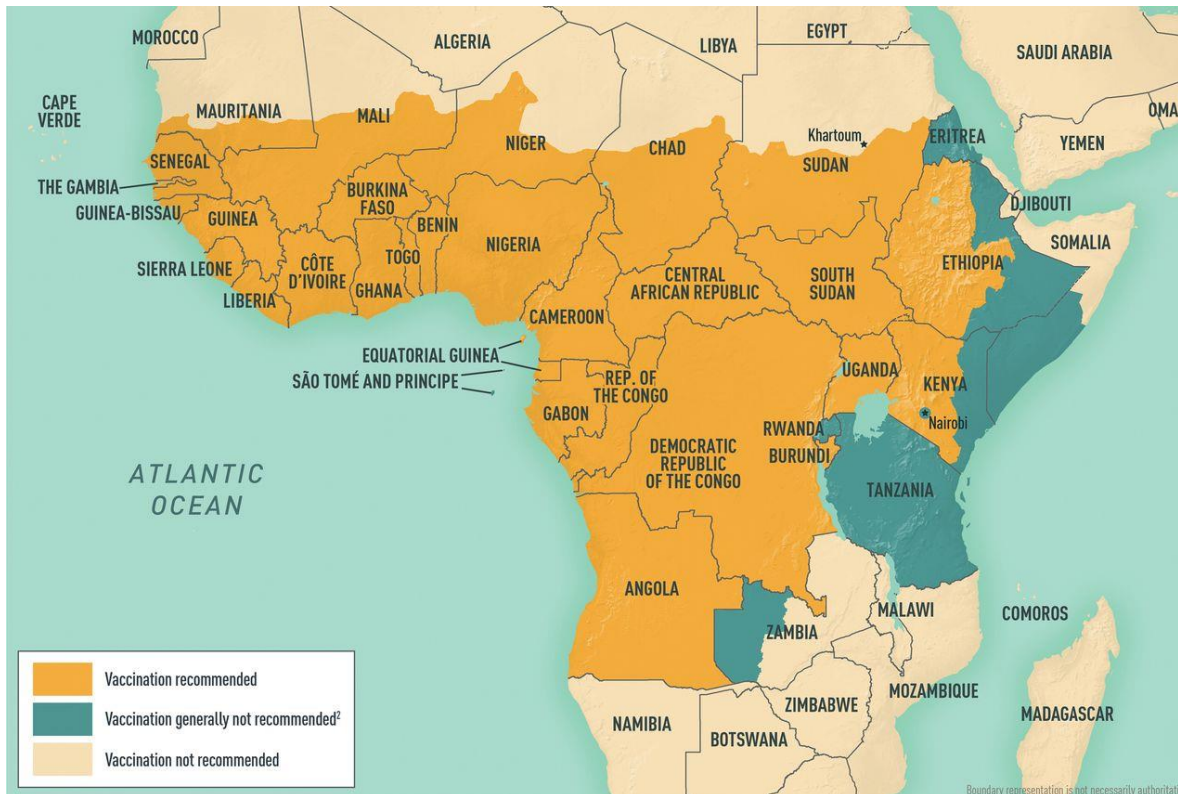
# Yellow Fever Endemic Zones

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# Yellow Fever Vaccination Proof



**Table 5-25 Countries that require proof of yellow fever (YF) vaccination from all arriving travelers<sup>1</sup>**

## AFRICA

Angola	Côte d'Ivoire	Niger
Benin	Democratic Republic of the Congo	Sierra Leone
Burkina Faso	Gabon	South Sudan
Burundi	Ghana	Togo
Cameroon	Guinea	Uganda
Central African Republic	Guinea-Bissau	
Congo, Republic of the	Mali	

## THE AMERICAS

French Guiana





**Table 4-26. Contraindications and precautions to yellow fever vaccine administration**

CONTRAINDICATIONS	PRECAUTIONS
<ul style="list-style-type: none"> <li>• Allergy to vaccine component<sup>1</sup></li> <li>• Age &lt;6 months</li> <li>• Symptomatic HIV infection or CD4 T-lymphocytes &lt;200/mm<sup>3</sup> (or &lt;15% of total in children aged &lt;6 years)<sup>2</sup></li> <li>• Thymus disorder associated with abnormal immune-cell function</li> <li>• Primary immunodeficiencies</li> <li>• Malignant neoplasms</li> <li>• Transplantation</li> <li>• Immunosuppressive and immunomodulatory therapies</li> </ul>	<ul style="list-style-type: none"> <li>• Age 6–8 months</li> <li>• Age ≥60 years</li> <li>• Asymptomatic HIV infection and CD4 T-lymphocytes 200–499/mm<sup>3</sup> (or 15%–24% of total in children aged &lt;6 years)<sup>2</sup></li> <li>• Pregnancy</li> <li>• Breastfeeding</li> </ul>

<sup>1</sup> If vaccination is considered, desensitization can be performed under direct supervision of a physician experienced in the management of anaphylaxis.

<sup>2</sup> Symptoms of HIV are classified in 1) Adults and Adolescents, Table 1. CDC. 1993 Revised classification system for HIV infection and expanded surveillance case definition for AIDS among adolescents and adults. MMWR Recomm Rep 1992;41(RR-17). Available from:

[www.cdc.gov/mmwr/preview/mmwrhtml/00018871.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/00018871.htm) and 2) Panel on Antiretroviral Therapy and Medical Management of HIV-Infected Children. Guidelines for the use of antiretroviral agents in pediatric HIV infection. 2010. Available from: <http://aidsinfo.nih.gov/ContentFiles/PediatricGuidelines.pdf> (PDF). p. 20-2.

# Japanese Encephalitis Virus Vaccine



- ▶ An arboviral infection is transmitted by the Culex mosquito.
- ▶ Risk
  - ▶ Endemic in rural areas of Asia
  - ▶ Temperate regions April to November
  - ▶ All year round in tropical and subtropical areas
  - ▶ Transmission to travelers is low
  - ▶ Vaccine recommended for traveler's who will be in rural areas for a month or longer
- ▶ Vaccine
  - ▶ Ixiaro®- licensed for persons 2 months and older
  - ▶ Associated with hypersensitivity reaction should be observe for at least 30 minutes and complete vaccine 10 days prior to travel

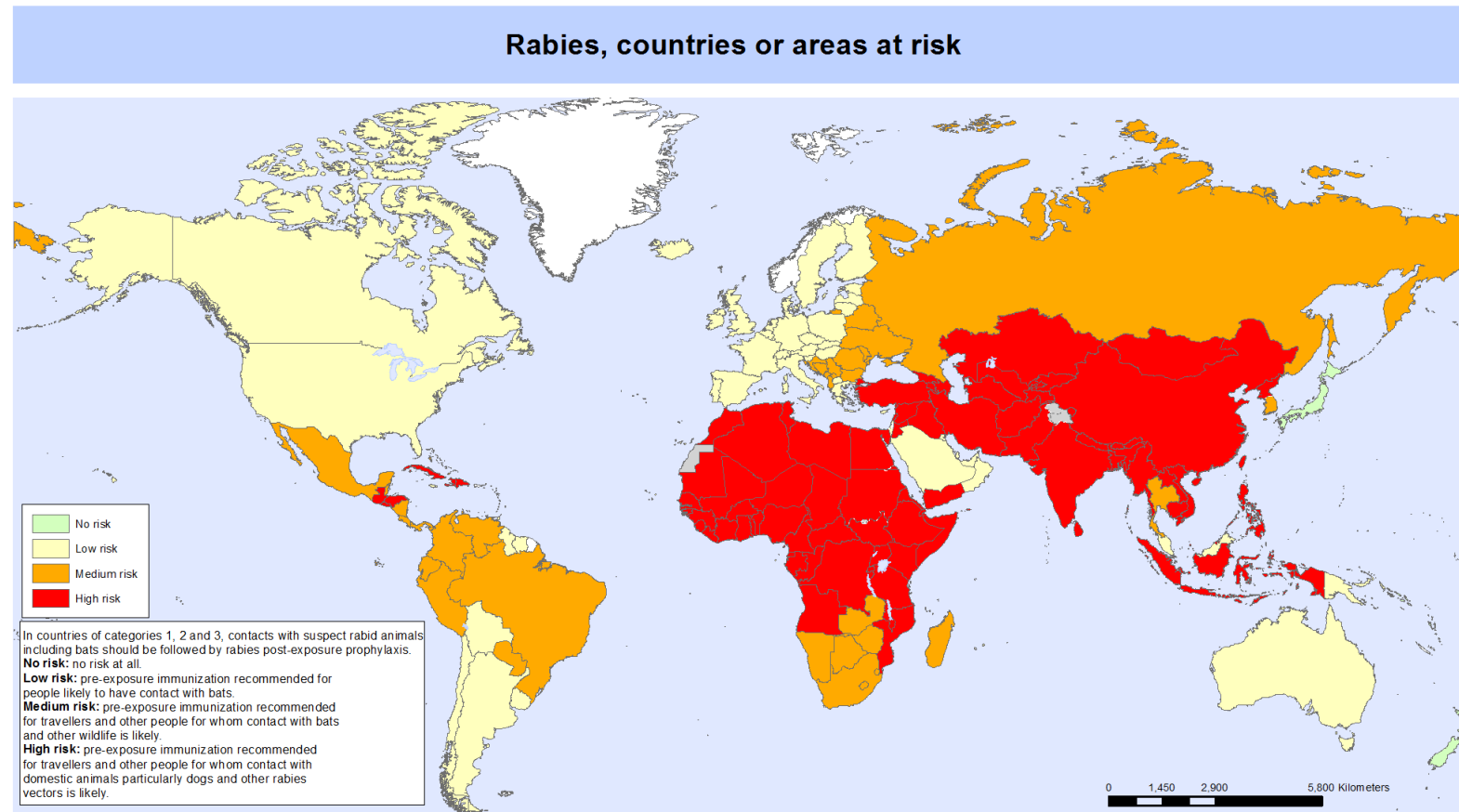
# JE Endemic Areas





- ▶ Pre-exposure vaccination
  - ▶ Not recommended for your average traveler related to manufacturer shortage.
- ▶ Risk
  - ▶ Endemic in Africa, Asia (India) and Latin America.
  - ▶ Risk to traveler is low.
  - ▶ Children have been recommended to receive pre-exposure b/c they interact with animals and do not report bites.
- ▶ Vaccine
  - ▶ 3 shots: 0, 7 and 21 or 28 days

# Rabies Map



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 and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: WHO Control of Neglected Tropical Diseases (NTD)  
 Map Production: Health Statistics and Information Systems (HSI)  
 World Health Organization



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## TB Meningitis – BCG Vaccine



- ▶ Not available in the USA.
- ▶ It is part of routine vaccination schedule in many countries.
- ▶ BCG prevents CNS TB infection.
- ▶ You need to instruct parent that they may need this vaccine while living in the country.
- ▶ Recommend young infants and children who will be traveling/living in TB endemic countries.



- ▶ Leading cause of death among children under 5 years of age.
- ▶ Causing more than ½ billion infections a year and 1 million deaths a year.
- ▶ Infection is caused by Plasmodium species through the bite of an infected female Anopheles mosquito.
- ▶ At risk:
  - ▶ Young children
  - ▶ Pregnant women
- ▶ Vaccine
  - ▶ Not available

# Risk for Malaria in the Americas

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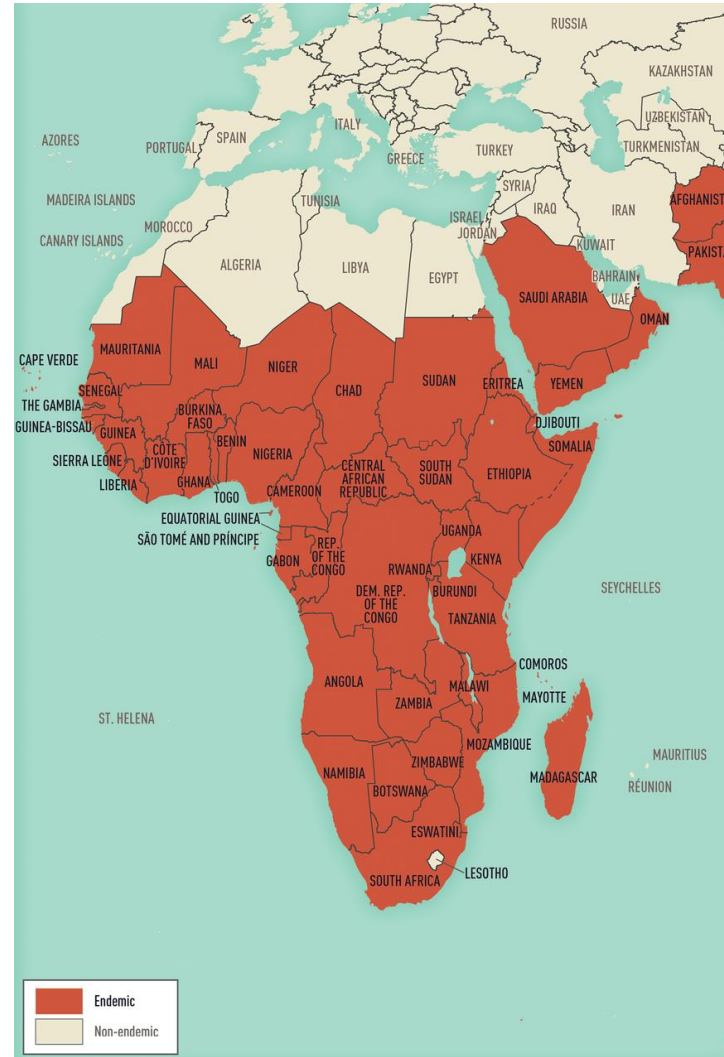
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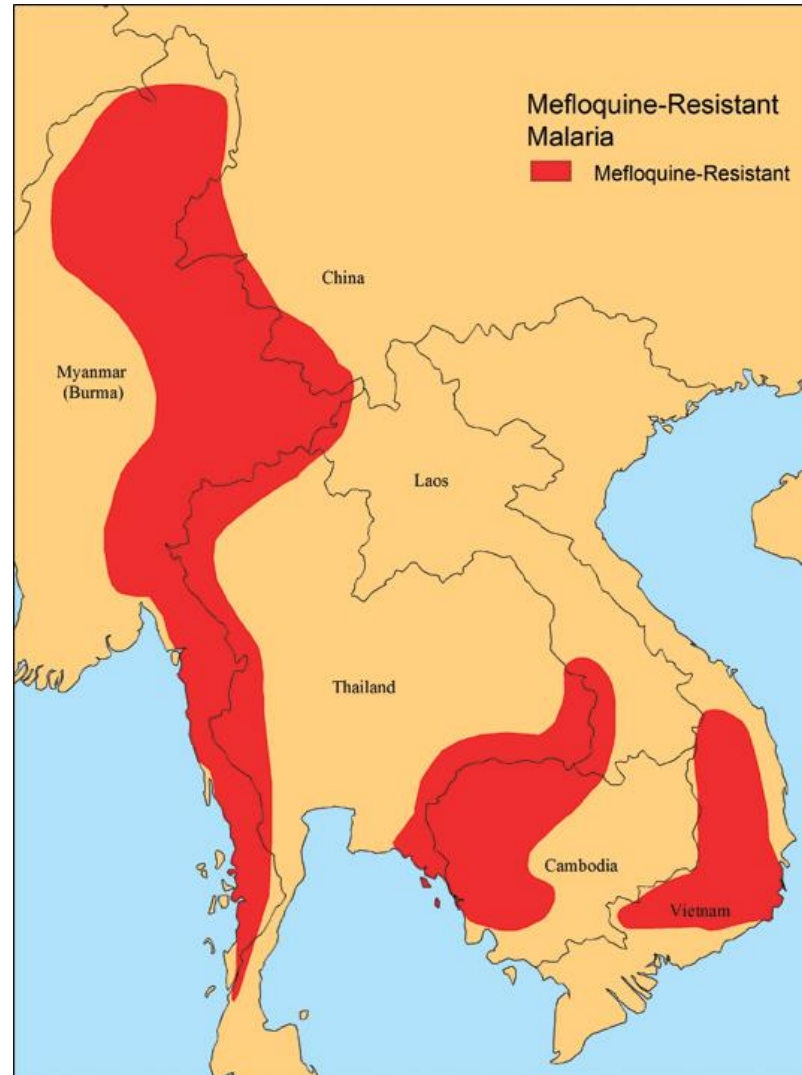




# Risk for Malaria in Africa and Asia



# Mefloquine-Resistant Malaria



# Malaria Medications



- ▶ May not be covered by insurance.
- ▶ Not all malaria medications are appropriate for all regions.
- ▶ Medications have side-effects.
- ▶ Need to know where patients are traveling and prescribe based the CDC recommendations.

# Dengue Fever in South America



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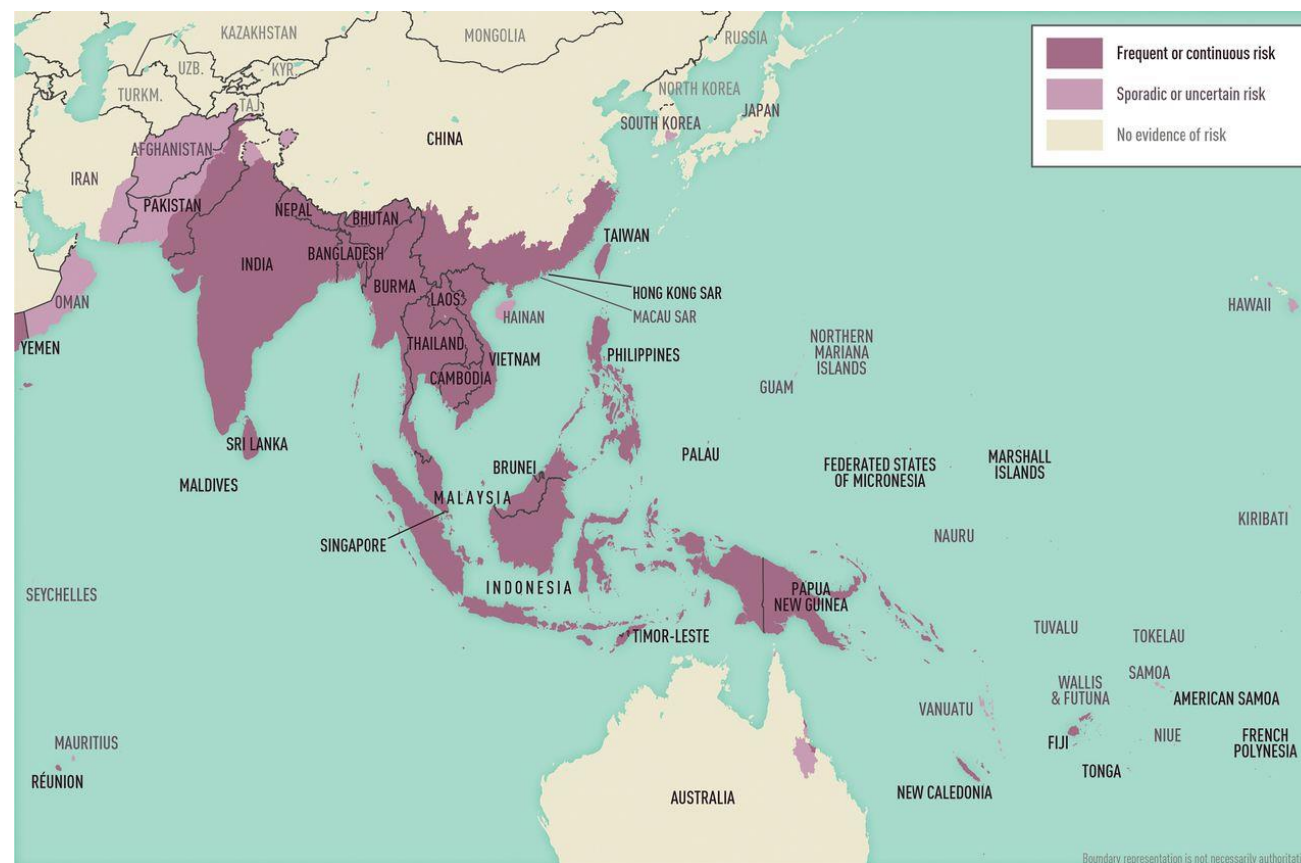
# Dengue Fever in Africa and Asia

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# Protective Measures



- ▶ DEET
  - ▶ Use at least 30% concentration
  - ▶ Can be use on infants older than 2 months of age
- ▶ PERMETHRIN
  - ▶ Insecticide that may be used to treat bed nets and clothing
- ▶ Clothing
  - ▶ Light colored clothing with long sleeves and pants

# Precautions for Use of Diethyltoluamide (DEET)



- ▶ Use repellents containing > 30% DEET only
- ▶ Apply sparingly to exposed skin
- ▶ Apply only to intact skin
- ▶ Apply to face by wiping, avoid eyes and mouth
- ▶ Do not spray directly on face
- ▶ Wash off with soap and water when coming indoors
- ▶ Do not inhale or ingest repellent
- ▶ Do not apply on hands or other areas that are likely to come in contact with the eyes or mouth
- ▶ Do not allow children under 10 years to apply DEET themselves
- ▶ Apply to your own hands then apply to the child
- ▶ Do not use on children less than 2 months of age

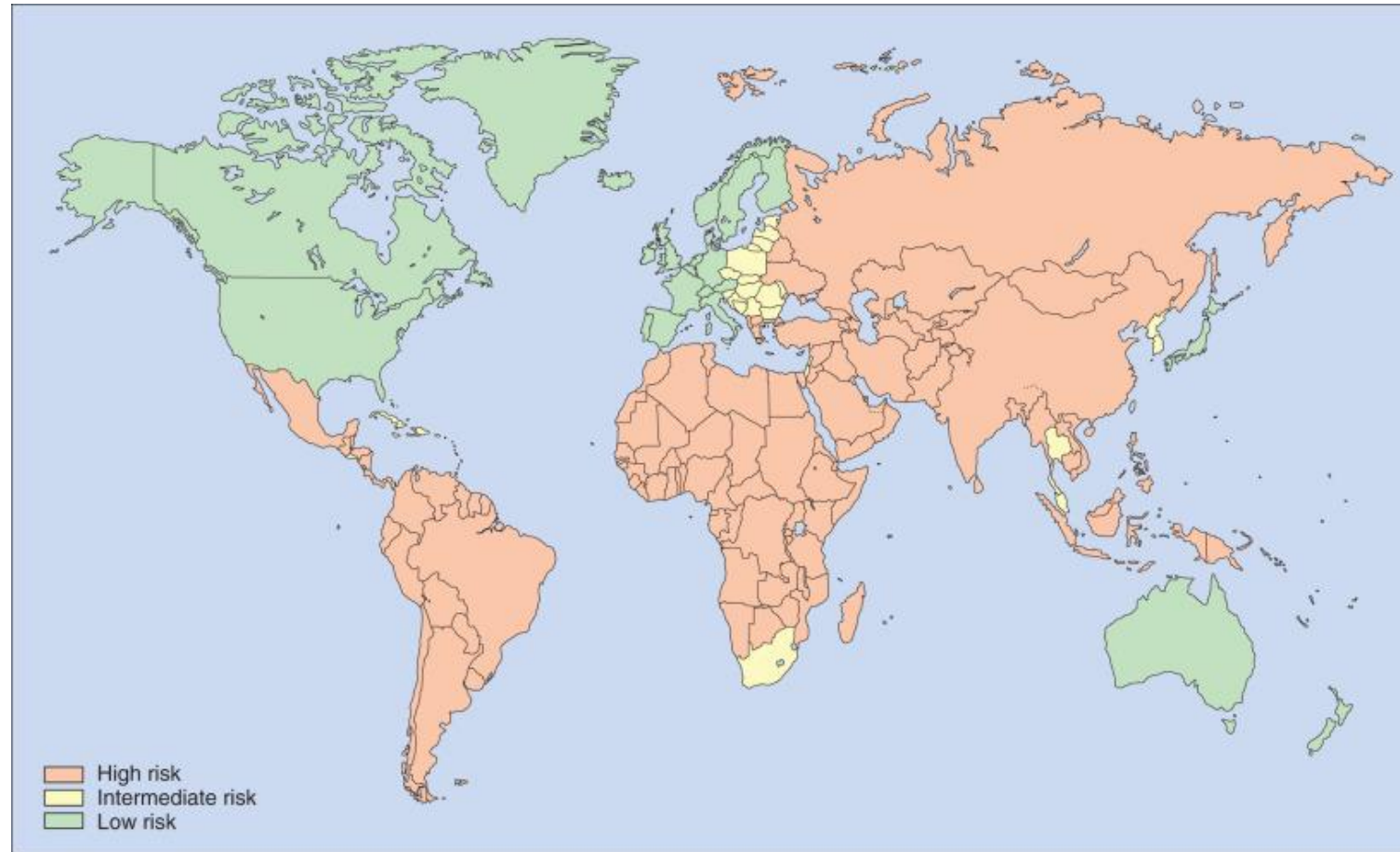
# Traveler's Diarrhea

- ▶ Risks
  - ▶ Most common illness among traveler's
  - ▶ 9 to 40% of pediatric traveler's
- ▶ Etiology
  - ▶ E. Coli
  - ▶ Salmonella
  - ▶ Campylobacter
  - ▶ Shigella





# Traveler's Diarrhea



# Traveler's Diarrhea



- ▶ Oral Rehydration
- ▶ Antibiotics
  - ▶ Azithromycin
    - ◆ If prescribing as a liquid make sure to have the med dispensed as a powder b/c once mixed only good for 2 weeks
- ▶ Zinc
  - ▶ Found to decrease duration
  - ▶ Dose
- ▶ If traveler's diarrhea does not respond to a course of antimicrobial therapy, medical attention should be sought.

# Prevention of Traveler's Diarrhea



## DO

- Eat only thoroughly cooked food served hot
- Peel fruit
- Drink only bottled, carbonated, boiled, chemically treated, or filtered water
- Prepare all beverages and ice cubes with boiled or bottled water
- Wash hands before eating or preparing foods
- Continue breastfeeding throughout travel period

## DO NOT

- Eat raw vegetables or unpeeled fruit
- Eat raw seafood or shellfish or undercooked meat
- Eat food from street vendors
- Drink tap water
- Consume milk or dairy products unless labeled as pasteurized or irradiated

*If you cannot*

*BOIL IT*

*PEEL IT*

*OR COOK IT*

*DO NOT EAT IT*

”

# Travel Notifications

- ▶ Notifications from CDC that informs travelers and clinicians about current health issues in different destinations that could impact a traveler's health
  - ▶ Disease outbreaks
  - ▶ Special events or gatherings
  - ▶ Natural disasters



Warning Level 3

Alert Level 2

Watch Level 1



- ▶ Personal prescription medications in their original containers Antimalarial medications, if applicable
- ▶ Over-the-counter antidiarrheal medication (e.g., bismuth subsalicylate, loperamide)
- ▶ Antibiotic for self-treatment of moderate to severe diarrhea
- ▶ Antihistamine
- ▶ Decongestant, alone or in combination with antihistamine
- ▶ Anti-motion sickness medication
- ▶ Acetaminophen, aspirin, ibuprofen, or other medication for pain or fever
- ▶ Mild laxative
- ▶ Cough suppressant/expectorant
- ▶ Throat lozenges
- ▶ Antacid
- ▶ Antifungal and antibacterial ointments or creams
- ▶ 1% hydrocortisone cream
- ▶ Epinephrine auto-injector (e.g., EpiPen), especially if history of severe allergic reaction. Also available in smaller-dose package for children

# Traveling with Medications



- ▶ Each country has their own laws about which medications travelers can bring.
- ▶ Check with the destination country's embassy to check which medications are authorized
  - ▶ Travelers may need to bring a medical certificate from their provider
- ▶ Copies of all prescriptions should be carried, including the generic names for medications, and a note from the prescribing physician on letterhead stationery for controlled substances and injectable medications



- ▶ Insect repellent containing DEET (up to 50%)
- ▶ Sunscreen (preferably SPF 15 or greater)
- ▶ Aloe gel for sunburns
- ▶ Digital thermometer
- ▶ Oral rehydration solution packets
- ▶ Basic first-aid items (adhesive bandages, gauze, ace wrap, antiseptic, tweezers, scissors, cotton-tipped applicators)
- ▶ Antibacterial hand wipes or alcohol-based hand sanitizer containing at least 60% alcohol (1)
- ▶ Moleskin for blisters
- ▶ Lubricating eye drops
- ▶ First aid quick reference card
- ▶ Other items that may be useful in certain circumstances
- ▶ Mild sedative (e.g., zolpidem) or other sleep aid
- ▶ Anti-anxiety medication
- ▶ High-altitude preventive medication
- ▶ Water purification tablets
- ▶ Commercial suture/syringe kits (to be used by local health-care provider. These items will also require a letter from the prescribing physician on letterhead stationery.)
- ▶ Latex condoms
- ▶ Address and phone numbers of area hospitals or clinics



# Traveler's Insurance

- ▶ Trip cancelation insurance
- ▶ Travel health insurance
- ▶ Medical evacuation insurance
- ▶ <https://wwwnc.cdc.gov/travel/page/insurance>



# Smart Traveler Enrollment Program (STEP)



- ▶ Smart Traveler Enrollment Program (STEP) - free service provided by the U.S. Government to U.S. citizens who are traveling to, or living in, a foreign country
- ▶ STEP allows you to enter information about your upcoming trip abroad so that the Department of State can better assist you in an emergency
- ▶ STEP also allows Americans residing abroad to get routine information from the nearest U.S. embassy or consulate

# Smart Traveler Enrollment Program (STEP)

- ▶ Security/Safety
  - ▶ Smart Traveler – <http://travel.state.gov/>
  - ▶ To Enroll: <https://step.state.gov/step/>



## Other Helpful Resources

- ▶ CDC: <https://wwwnc.cdc.gov/travel/>
- ▶ Yellow book: <https://wwwnc.cdc.gov/travel/page/yellowbook-home>
- ▶ Travax.com



# References

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- [www.travax.com](http://www.travax.com)
- [www.istm.org](http://www.istm.org)
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**THANKS!**

## Upcoming Webinars



- ▶ CCDPH & AHC Hepatitis B Webinar Series: Reducing the Risk of Hepatitis B – Perinatal Hepatitis B Webinar
  - ▶ Monday May 22<sup>nd</sup> from 12:00 PM – 1:00 PM
- ▶ Implicit Bias Awareness Training for Pediatricians
  - ▶ Thursday May 25<sup>th</sup> from 10:00 AM – 11:00 AM
- ▶ Illinois Vaccinates Against COVID-19 In-Person Bootcamp
  - ▶ Friday June 16<sup>th</sup> from 8:30 AM – 2:00 PM
- ▶ Back to School, Back to Vaccine Basics
  - ▶ Tuesday June 20<sup>th</sup> from 12:00 PM – 1:00 PM

**Register at [illinoisaap.org/events](https://illinoisaap.org/events)**