

Leaving on a Jet Plane

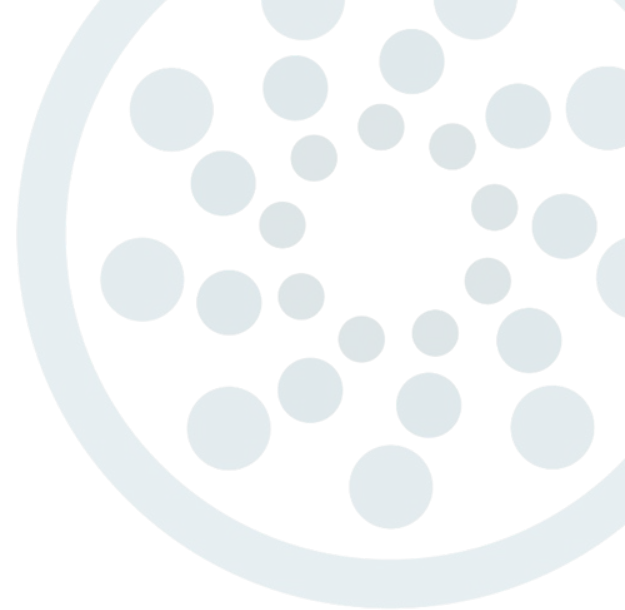
Protecting your patients during travel

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2025 Wyoming Immunization Conference



Overview

- Why is this topic important?
- Components of a pre-travel consultation
- Travel vaccines
 - Routine vaccines
 - Travel-specific vaccines
- Last-minute travelers
- Resources



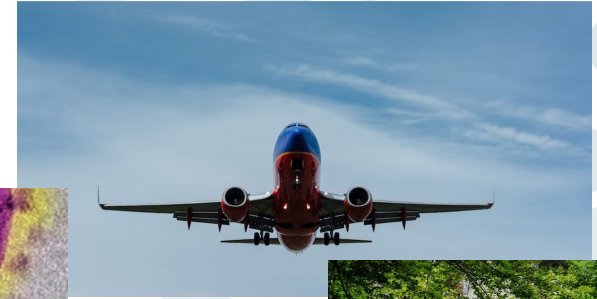
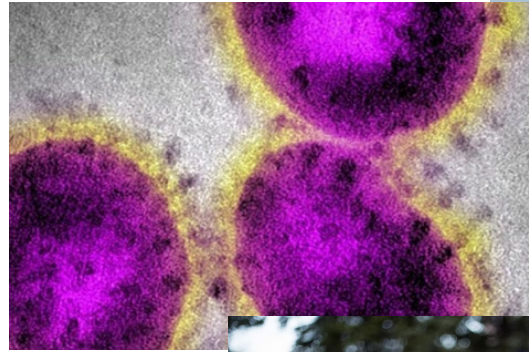
Why care?

“Travelers are an epidemiologically important population because of their mobility, their potential for exposure to diseases outside their home country, and the possibility that they may serve as a conduit for disease from one country to another.”

CDC, 2020

Why is travel medicine important?

- Global society
- Increased travel
- Emerging pathogens
- Climate change
- Changing habitat
- Antibiotic resistance

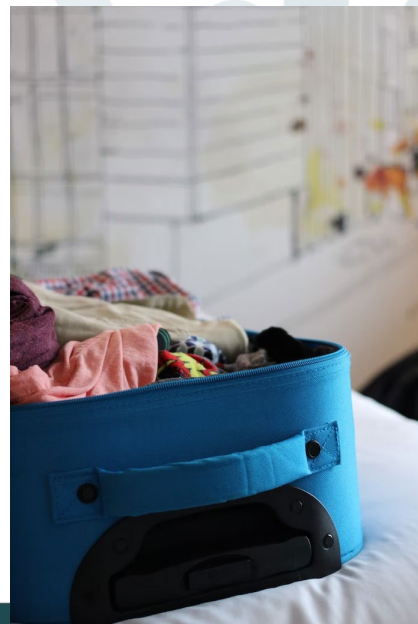


Many diseases rarely or never seen in the United States are still common worldwide!!



The scope of international travel

- 1.4 billion worldwide international tourist arrivals in 2024
- In 2022, U.S. residents made nearly 81 million trips with at least 1 night spent outside of the U.S.
- Many different travel reasons:
 - Tourism
 - Business
 - Education
 - Research
 - Visiting friends and family
 - Mission work
 - International disaster and humanitarian response
 - Medical tourism



Wyoming travel

- 4.7 million visitors to Yellowstone National Park in 2024
- 8.8 million overnight visits to Wyoming in 2024



Pre -Travel Consult

You're going where and doing what?!



Pre-travel consult

- Routinely ask about travel on all patients during all encounters
 - This preliminary screening helps direct patients to seek appropriate pre-travel consults
- Travel vaccines and consults are not just for traveling to [insert your favorite developing nation here]
 - Vaccines and other travel medicine counseling may be needed for “standard” trips to places like Mexico and Europe
 - Thanks to recent domestic outbreaks and cases of measles and polio, attention was brought to domestic travel as well
- Only 41% of U.S. travelers receive a pre-travel consultation
 - Only 18% who were visiting friends or family

Pre-travel consult components

- Risk assessment of the traveler
 - Trip details
 - Health background
- Communicate the risks
- Provide risk management measures
 - Vaccinations
 - Medications
 - Educational materials

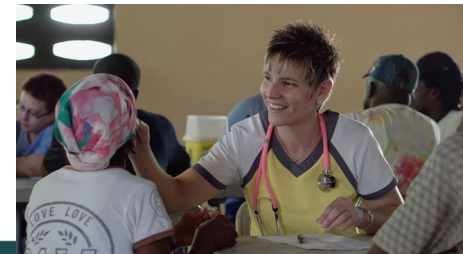
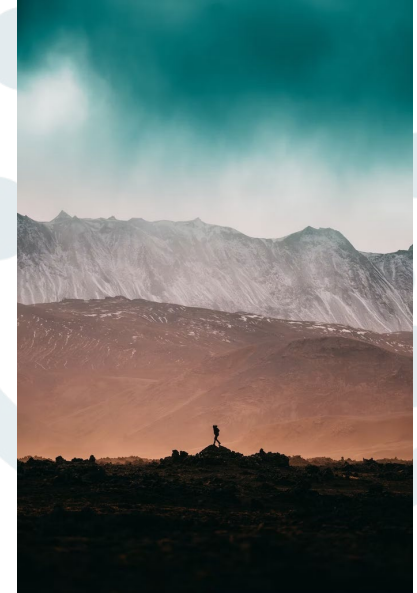


Trip details

- Itinerary
 - Countries and specific regions
 - Including the order of countries if visiting more than one, including layovers
 - Rural or urban areas
- Timing
 - Trip duration
 - Season of travel
 - Remember the seasons are “flipped” in the Southern Hemisphere
 - Time to departure
 - Ideally, pre-travel consults should take place at least 1 month in advance of departure

Trip details

- Reason for travel
 - Tourism
 - Business
 - Visiting friends or relatives
 - Heritage travel
 - Volunteer, missionary, or aid work
 - Research or education
 - Adventure
 - Pilgrimage
 - Adoption
 - Medical tourism



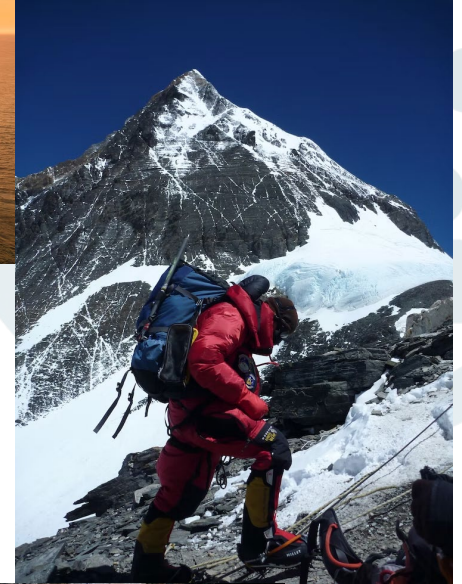
Trip details

- Travel style
 - Independent vs. packaged tour
 - Likelihood of “adventurous eating”
 - Traveler risk tolerance
 - General hygiene standards at the destination
 - Modes of transportation
 - Accommodation at the destination



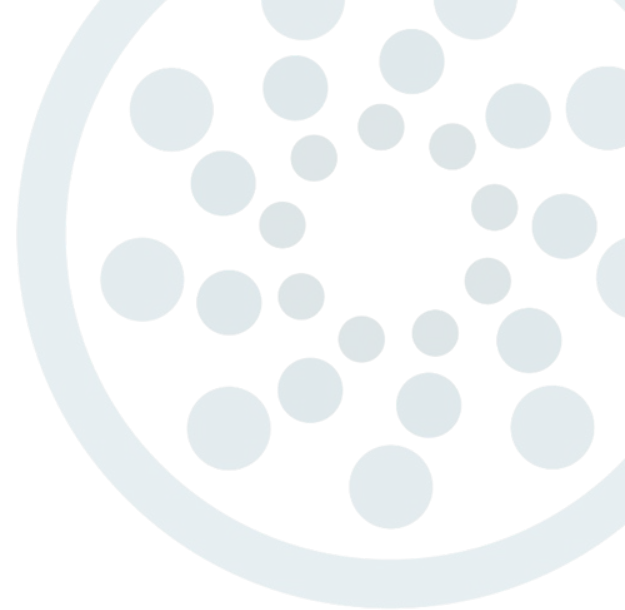
Trip details

- Special activities
 - Disaster relief
 - Medical care (providing or receiving)
 - High altitude
 - Diving
 - Cruise ship
 - Water exposure
 - Cycling
 - Extreme sports
 - Spelunking
 - Interactions with animals
 - Anticipated sexual encounters



Health background

- Past medical history
 - Age
 - Sex
 - Underlying medical conditions
 - Allergies
 - Medications
- Special medical conditions
 - Pregnancy
 - Severe allergies
 - Recent surgeries



Health background

- Immunization history
 - Receipt of routine and travel vaccines
- Prior travel experience
 - Malaria chemoprophylaxis
 - High altitude experience
 - Illnesses related to prior travel



Communicate the risk

- Two-way exchange of information between the clinician and the traveler
- Discuss
 - Potential health hazards at the destination(s)
 - Effectiveness of preventive measures
- Traveler's perception of and tolerance for risk can vary widely

Manage risk

- Administer recommended vaccines
- Malaria prophylaxis
- Bring copies of medical records and current medications
- Plan for treatment/mitigation of conditions like asthma
- Obtain travel insurance
- How to find reputable medical facilities at the destination
- Medical ID jewelry and cards
- Translations of allergies into the local language



Travel vaccinations

- Considerations
 - Is there sufficient time before travel to complete a vaccine series?
 - Pay attention to vaccines for which immunity may have waned over time
 - Td/Tdap
 - Recent immunocompromising conditions
 - Hematopoietic stem cell transplants
 - Chemotherapy
 - Other immunosuppressive medications
 - Future travel plans in the next 1-2 years to justify receiving certain vaccines
 - Rabies and Japanese encephalitis vaccines due to cost
 - Insurance reimbursement and costs

Questions?



Routine Immunizations



Routine immunizations

- It is recommended that all travelers are up to date with all routine immunizations for which they are eligible according to the ACIP Recommended Immunization Schedule
 - Children, adults, and everyone in between!
- This includes the annual flu shot

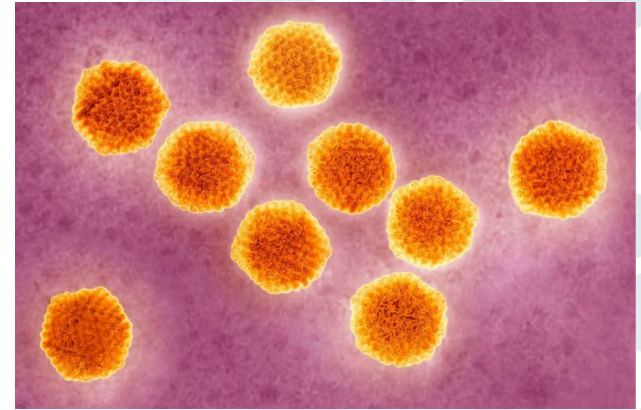
Routine immunizations

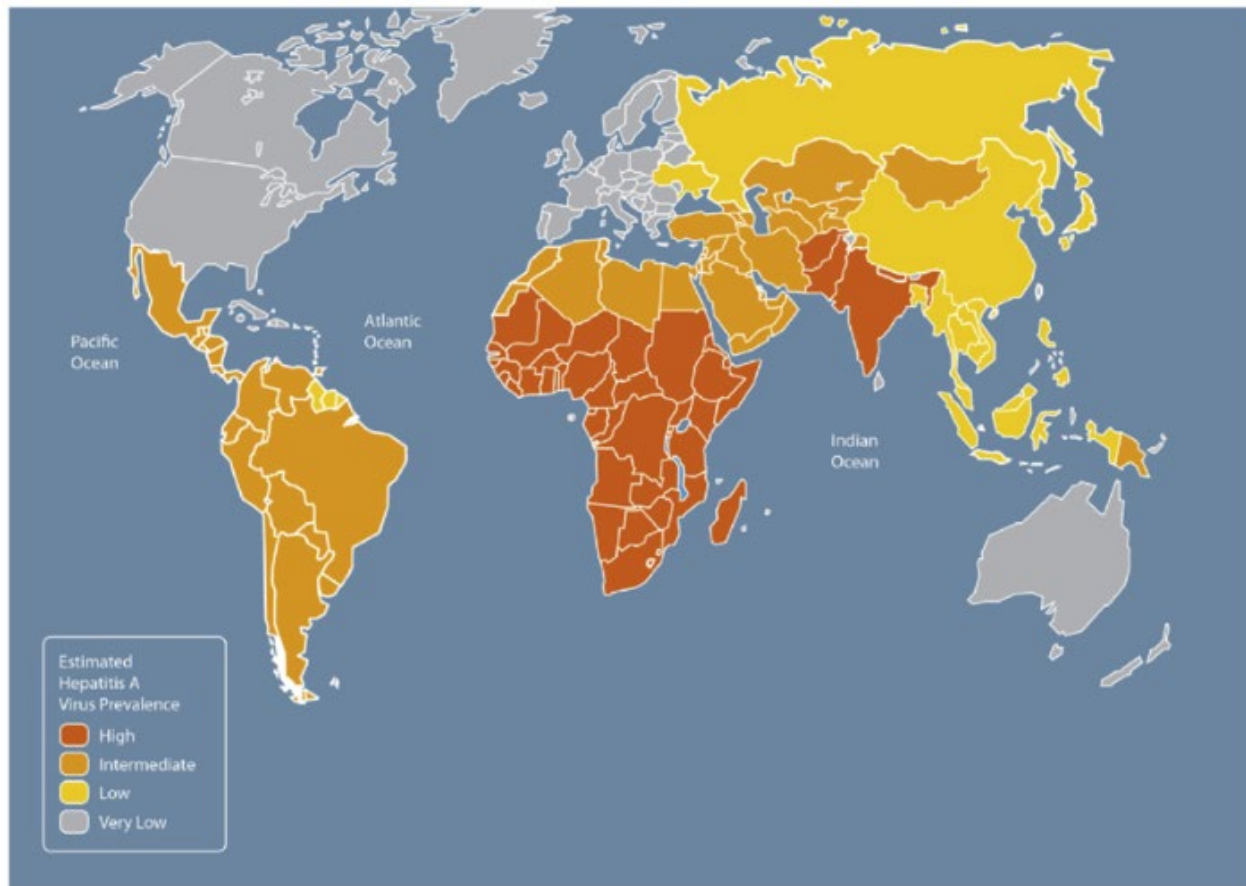
- COVID-19
- *Haemophilus influenzae* type b (Hib)
- **Hepatitis A**
- **Hepatitis B**
- Herpes zoster (shingles)
- Human papillomavirus (HPV)
- **Influenza**
- **Measles, mumps, rubella (MMR)**

- **Meningococcal**
- Pneumococcal
- **Polio**
- Rotavirus
- Respiratory syncytial virus (RSV)
- Tetanus, diphtheria, pertussis (DTaP, Tdap)
- Varicella

Hepatitis A

- Viral liver infection
- Fecal-oral transmission
 - Person-to-person contact, contaminated food and water
- Common in areas with inadequate sanitation and limited access to clean water
- Endemic in parts of Africa, Asia, Central & South America, Eastern Europe
- All susceptible people traveling for any purpose, frequency, and duration to countries with high or intermediate endemicity should be vaccinated

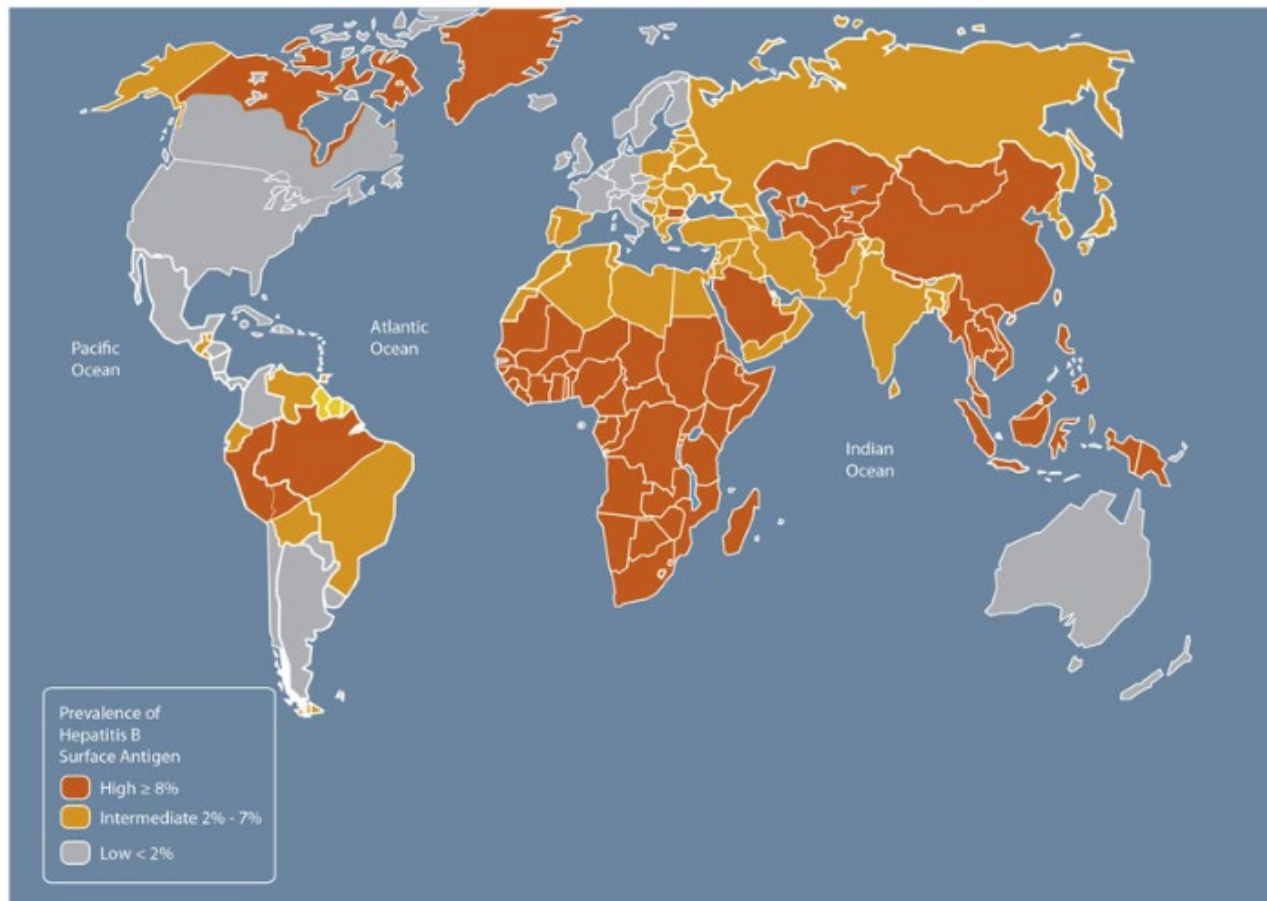




Prevalence of HAV by country. Footnote: Source: Adapted from Centers for Disease Control and Prevention. CDC Health Information for International Travel 2014. New York: Oxford University Press; 2014.

Hepatitis B

- Viral infection
- Spread through contact with bodily fluids
- Recommended for travelers visiting countries where HBsAg+ prevalence is >20%
 - Asia, Africa, South America, and the Caribbean
- May be considered for all travelers depending upon behavioral risk and potential for exposure as determined by the provider and traveler
 - Seeking medical or dental procedures
 - Tattoos and piercings
 - Acupuncture
 - Sexual activity



Prevalence of HBV by country. Footnote: Source: Adapted from Centers for Disease Control and Prevention. CDC Health Information for International Travel 2014. New York: Oxford University Press; 2014.

Influenza

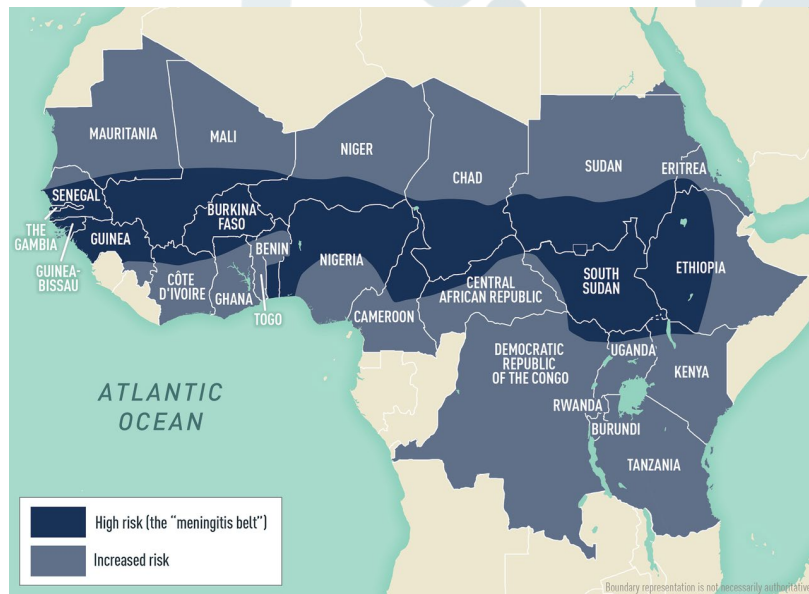
- Southern Hemisphere's flu season typically runs from April to September
- Year-round transmission may occur in tropical areas
- Outbreaks have occurred on cruise ships
- Novel viruses can be transmitted to travelers visiting areas with the circulation of these viruses

Measles, mumps, and rubella (MMR)

- Viral respiratory illnesses
- Infants 6-11 months old
 - 1 dose of MMR may be given before travel
 - This dose does not count as the first dose in the routine childhood vaccination series
- 12 months or older with no evidence of immunity
 - 2 doses of MMR given 28 days apart
- 12 months or older who have documentation of 1 valid dose
 - 1 additional dose before travel, at least 28 days after the previous dose
- In 2009-2014, 53% of non-immune MMR-eligible travelers were not vaccinated during their pre-travel health consultation

Meningococcal ACWY

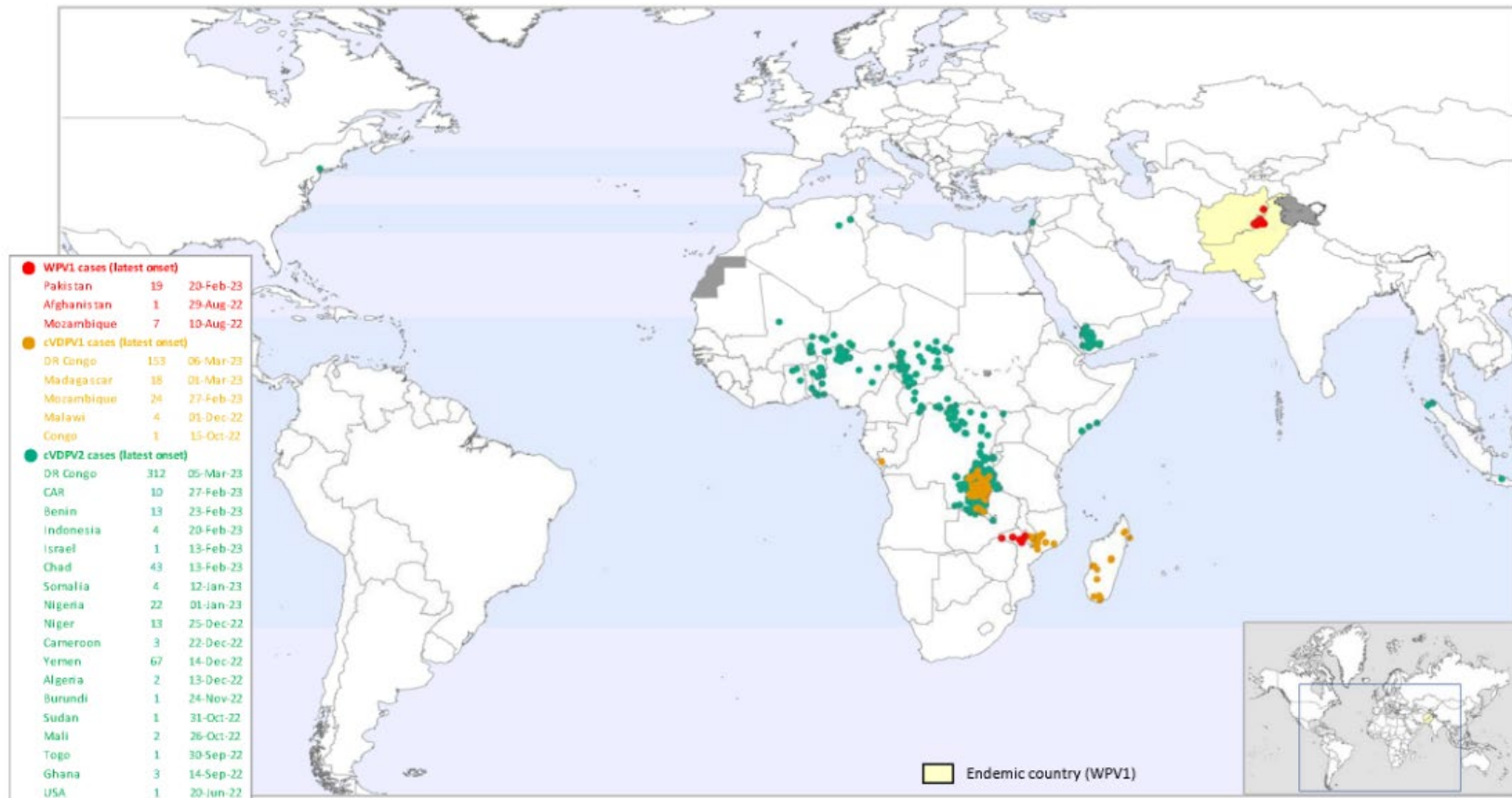
- Disease caused by the bacterium *Neisseria meningitidis*
- Meningitis Belt during the dry season (December-June)
- Hajj or Umrah pilgrimage requirement
 - Required for entry into Saudi Arabia for these travel reasons
 - At least 10 days and no more than 3 years before arrival for the polysaccharide vaccine and no more than 8 years before arrival for the conjugate vaccine



Polio

- Viral illness spreads through fecal-oral contact
- Single, lifetime booster dose for adults traveling to certain countries
- Unvaccinated travelers and those with unknown vaccination status should complete the routine series
- Temporary recommendations in place for vaccination in countries with wild or vaccine-derived poliovirus circulation may impact entry/exit

Global WPV1 & cVDPV Cases¹, Previous 12 Months²



¹Excludes viruses detected from environmental surveillance; ²Onset of paralysis: 26 Apr. 2022 to 25 Apr. 2023

Data in WHO HQ as of 25 Apr. 2023

Questions?

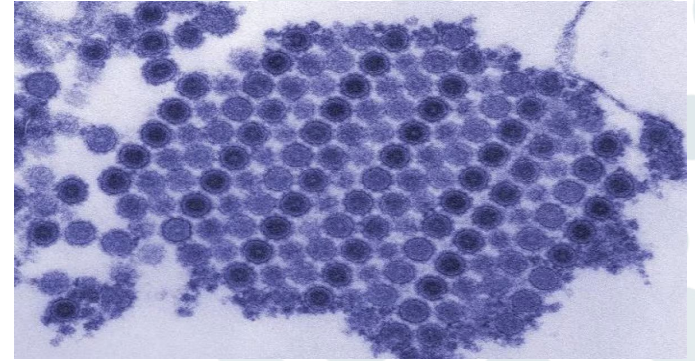


Travel Vaccinations



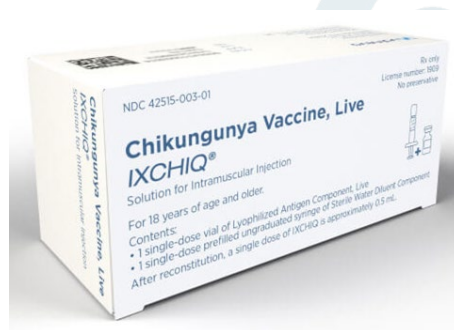
Chikungunya

- Viral illness transmitted via the bite of an infected *Aedes* mosquito
 - Maternal-fetal transmission has been documented
- Found in tropical and subtropical regions
 - Africa, the Americas (including the continental U.S.), Asia, Europe, and islands in the Indian and Pacific Oceans
- Risk to travelers is greatest in areas experiencing ongoing epidemics
- Disease is often characterized by the sudden onset of high fever and joint pains



Chikungunya vaccine

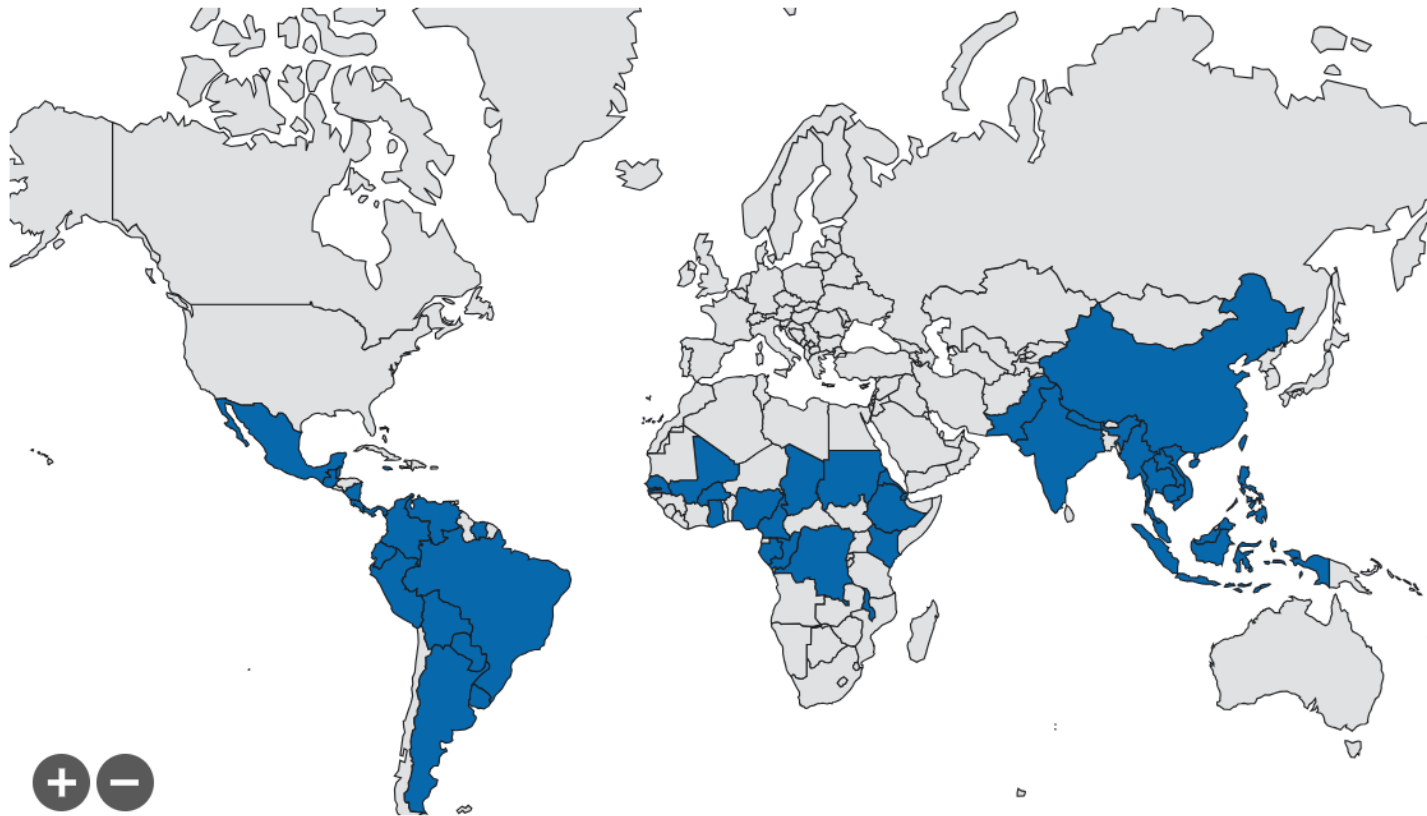
- IXCHIQ (CHIK-LA, Valneva)
 - Live, attenuated
 - Single, 0.5mL dose IM
 - Licensed for adults 18 years and older
- Vimkunya (CHIK-VLP, Bavarian Nordic)
 - Inactivated
 - Single, 0.8mL dose IM
 - Licensed for 12 years and older



Chikungunya vaccine recommendations

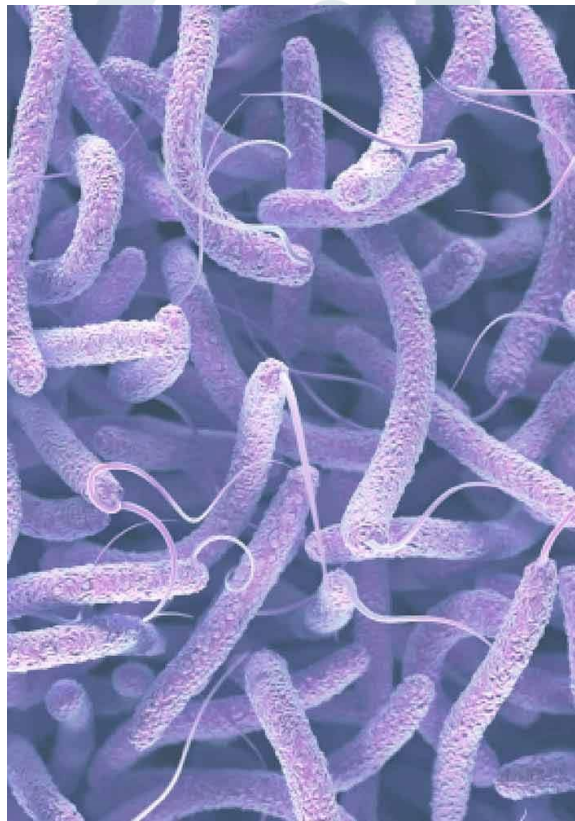
- IXCHIQ
 - Recommended for persons aged 18 years and older traveling to a country or territory where there is a chikungunya outbreak
 - May be considered for persons 18 years and older traveling to a country or territory without an outbreak but with elevated risk if planning travel for an extended period of time, e.g, 6 months or more
 - Currently not recommended for use in those 60 years and older
- Vimkunya
 - Recommended for persons aged 12 years and older traveling to a country or territory where there is a chikungunya outbreak
 - May be considered for persons 12 years and older traveling to a country or territory without an outbreak but with elevated risk if planning travel for an extended period of time, e.g, 6 months or more

Countries with evidence of chikungunya virus transmission to humans during last 5 years



Cholera

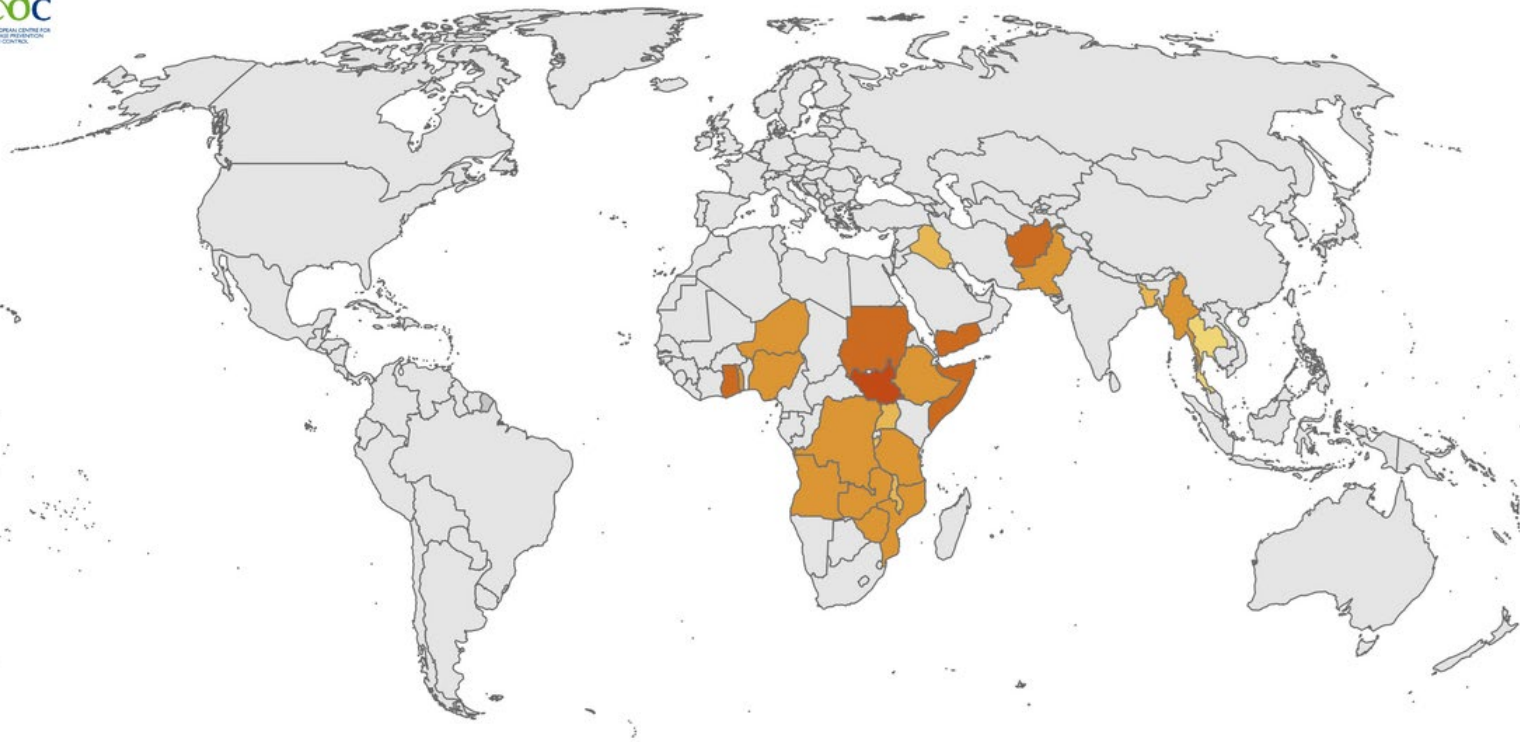
- Bacterial diarrheal illness caused by *Vibrio cholerae*
- Fecal-oral transmission
 - Contaminated water, fish, and shellfish
- Endemic primarily in Africa and Asia
- Travelers who consistently observe safe food, water, sanitation, and handwashing recommendations while in countries affected by cholera have virtually no risk of acquiring cholera



Cholera vaccine

- Vaxchora (Bavarian Nordic)
 - Single-dose, live oral vaccine
 - Powdered components are mixed with 100 mL of purified bottled water
 - Licensed 2-64 years
 - Recommended for travelers to areas of active cholera transmission
 - Administer at least 10 days before travel
 - No food or water 60 minutes before or after vaccine administration
 - Duration of protection is at least 3-6 months





Notification rate per 100 000 persons



Note: Data refer to cases reported in the last 3 months. Administrative boundaries: © EuroGeographics
The boundaries and names shown on this map do not imply official endorsement or acceptance by the European Union. ECDC. Map produced on 21 February 2025

Japanese encephalitis (JE)



- Viral infection
- Transmitted through mosquito bites
- Occurs throughout most of Asia and parts of the western Pacific
 - Rural agricultural areas
- Itinerary review is necessary before vaccination
 - Travel location, duration, activities, accommodations, and seasonal patterns of disease
 - ACIP recommends the vaccine for:
 - People moving to a JE-endemic area
 - Travelers visiting for ≥ 1 month in a JE-endemic area
 - Frequent travelers to endemic areas
 - Short-term travelers (< 1 month) based on duration, season, location, activities, and accommodations

JE vaccine

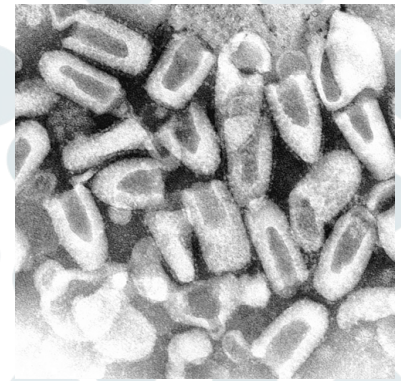
- Ixiaro (Valneva)
 - Inactivated, 0.5mL IM
 - Licensed for ≥ 2 months
 - 2 months-17 years and ≥ 65 years
 - 0, 28 days 2-dose series
 - Booster ≥ 1 year after primary series if needed
 - 18-64 years
 - 0, 7-28 days 2-dose series
 - Booster ≥ 1 year after primary series if needed





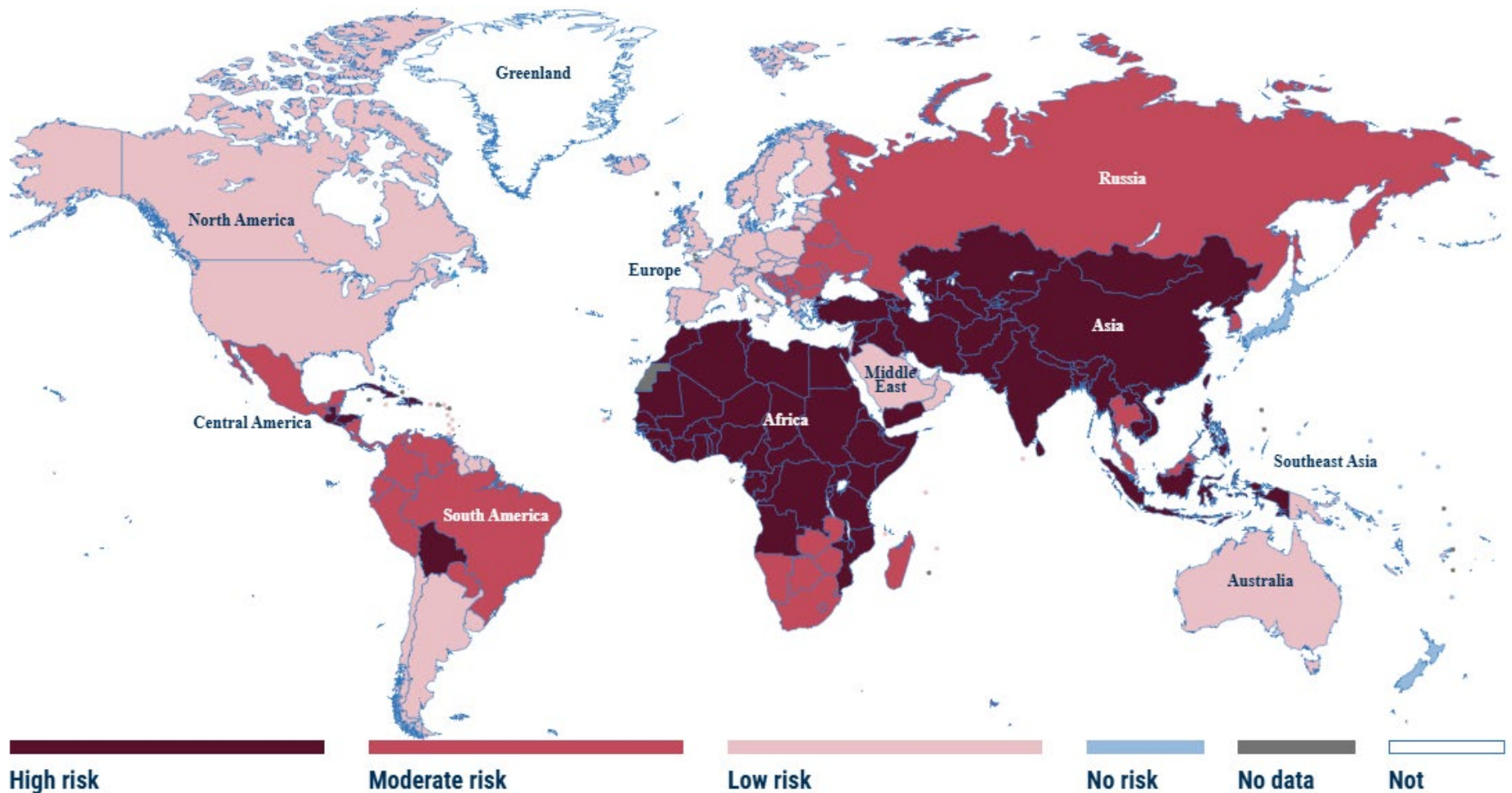
Rabies

- Fatal viral infection
- Transmitted through saliva from the bite of a rabid animal
- Prevention
 - Education about the risk and need to avoid bites from mammals
 - Petting all the dogs is not a smart idea, as canine rabies vaccination is not common outside of the U.S.
 - Bat bites anywhere in the world are a cause of concern and an indication to consider prophylaxis
 - Plan for how to obtain post-exposure prophylaxis
 - Medical travel evacuation insurance
- Vaccination is recommended for
 - Travel to geographical regions with rabies virus reservoirs, particularly where rabies virus is endemic in dog populations
 - Planned contact with wild or domestic animals
 - Rural or remote travel with limited healthcare access



Rabies vaccination

- Pre-exposure vaccination
 - Imovax (Sanofi) and RabAvert (Bavarian Nordic)
 - IM injection
 - 2 doses given 7 days apart
 - <3 years of potential for high-risk exposure
 - No booster indicated
 - ≥3 years of potential for high-risk exposure
 - Check titer 1-3 years after primary 2-dose series
 - If titer <0.5 IU/mL, then given booster dose
 - Or... booster no sooner than day 21 and no later than 3 years after 2-dose primary series



Tick -borne encephalitis (TBE)



- The virus spreads through the bite of an infected *Ixodidae* tick
 - Rarely through the consumption of unpasteurized dairy products
- Found in parts of western and northern Europe, through northern and eastern Asia
- Most infections are asymptomatic, but can cause aseptic meningitis, encephalitis, or meningoencephalomyelitis
- Vaccination
 - Recommended for persons who are moving or traveling to a TBE-endemic area
 - Key factors
 - Traveling during warmer spring and summer months
 - Certain recreational activities (such as hiking, camping, hunting, and fishing) in tick habitats
 - Working in outdoor settings where there is increased risk of coming into contact with ticks (e.g., forestry workers, farmers, military personnel, fieldwork)
 - Staying for longer periods or repeated travel to endemic areas

TBE vaccine

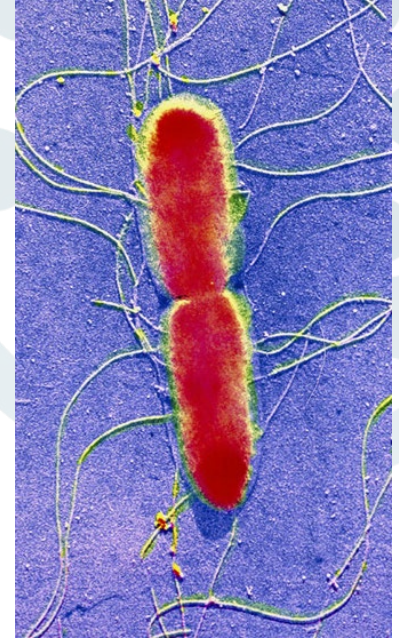
- TicoVac (Pfizer)
 - Inactivated, IM injection
 - Licensed for those 1 year and older
 - ≥16 years old
 - 0.5mL dose
 - 3-dose series at 0, 14 days-3 months (after dose 1), and 5-12 months (after dose 2)
 - 1-15 years old
 - 0.25mL dose
 - Same as above, except dose 2 is given 1-3 months after dose 1
 - Booster at least 3 years after primary 3-dose series, if needed





Typhoid

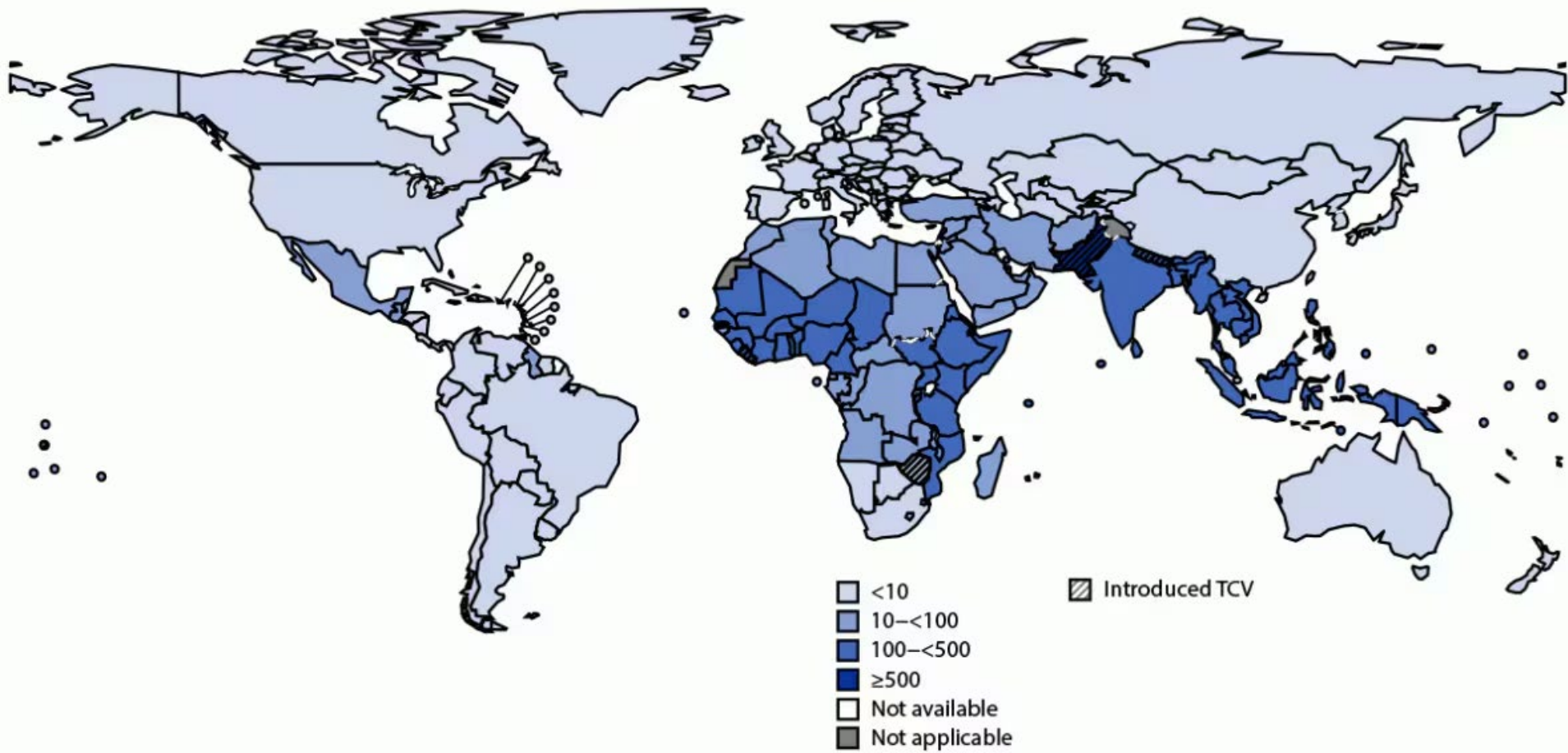
- Bacterial illness caused by *Salmonella enterica* typhi
- Fecal-oral transmission
- High-risk regions include Southeast Asia, Eastern Mediterranean, and Africa
- Lower risk regions include South America, East Asia, and the Caribbean
- Antimicrobial resistance is increasingly problematic
- Travelers staying with friends and family are at a higher risk



Typhoid vaccine

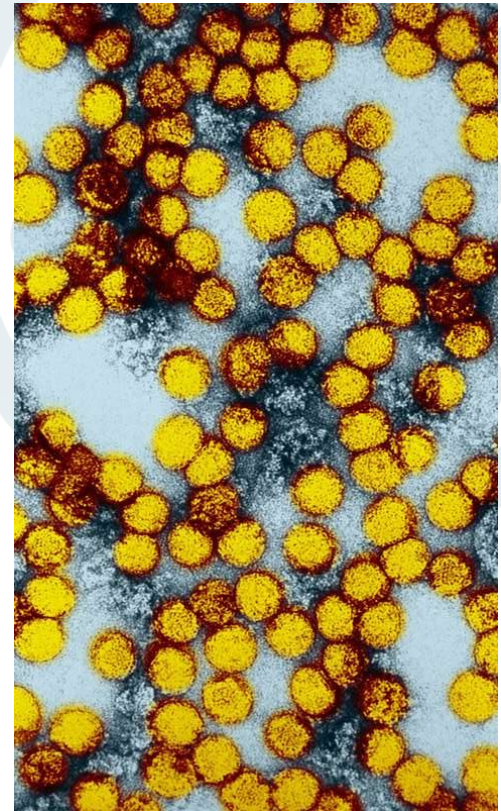
- Available vaccines have an efficacy of 50-80%
- Typhim Vi (Sanofi)
 - IM injection
 - ≥ 2 years
 - Booster every 2 years, if needed
- Vivotif (Bavarian Nordic)
 - Oral capsules
 - 4 capsules taken every other day at home
 - ≥ 6 years
 - Booster every 5 years, if needed





Yellow Fever

- Viral *Flavivirus* infection
- Transmitted via the bite of an infected *Aedes* mosquito
- Endemic in sub-Saharan Africa and tropical South America
- In those who develop symptomatic illness, 12% progress to a more serious form of the disease, characterized by hemorrhagic symptoms, jaundice, and eventually shock and organ failure
 - Case-fatality rate for severe cases is 30-60%
- Vaccination
 - Requirement for entry into certain countries
 - All travelers, or
 - Those coming from a country with a risk of transmission (including airport layovers)
 - Recommended (but not required) for some countries

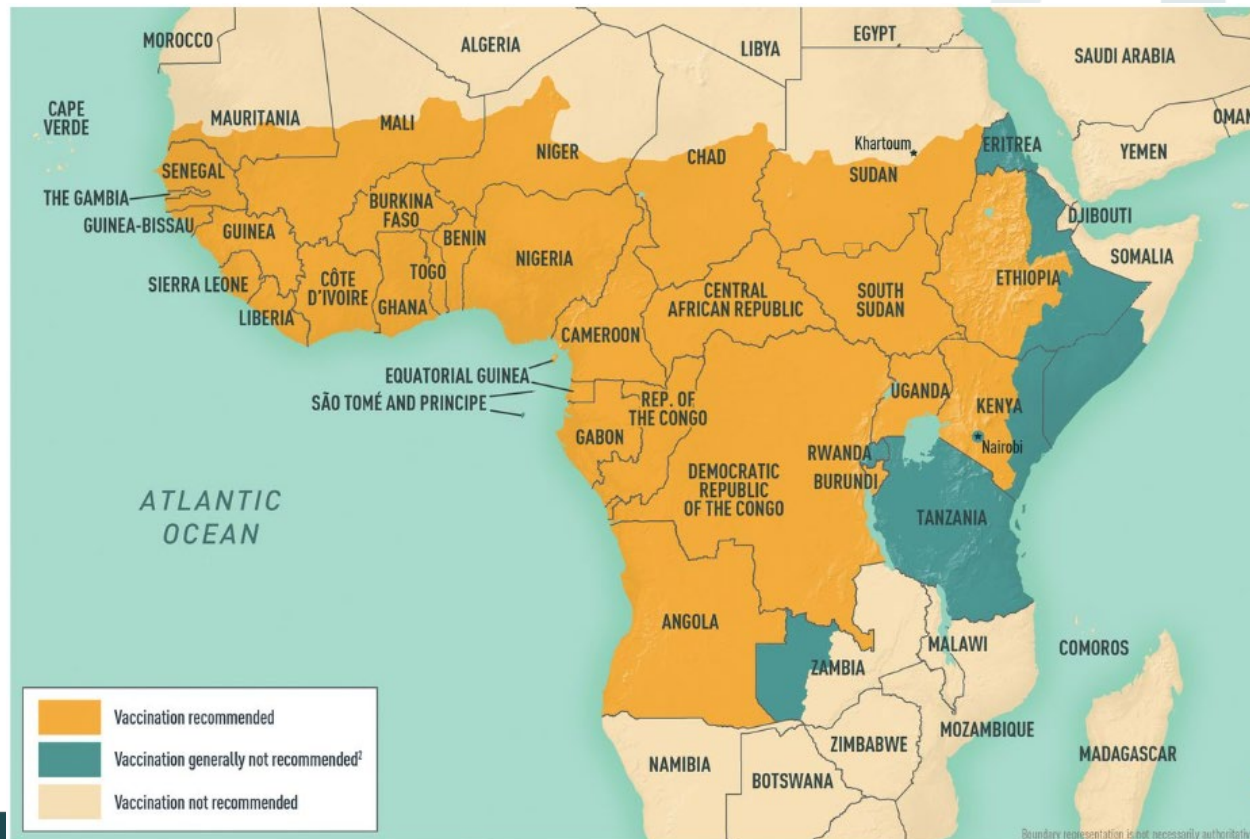


Yellow Fever vaccine

- YF-VAX (Sanofi)
 - Live, attenuated
 - Subcutaneous administration
 - Licensed for those ≥ 9 months
 - 1 lifetime dose is recommended
 - Available only at clinics enrolled with the Wyoming Yellow Fever Vaccine Program



Yellow Fever - Africa



Yellow Fever - South America



Entry requirements

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

Footnotes

[show / hide](#)

¹ Current as of January 2023. Country requirements for YF vaccination are subject to change at any time; check with the destination country's embassy or consulate before departure.

International Certificate of Vaccination (ICVP)

INTERNATIONAL CERTIFICATE OF VACCINATION OR PROPHYLAXIS
Certificat international de vaccination ou de prophylaxie

This is to certify that ^① Jane Mary Doe ^② 22 March 1960 F United States
 Nous certifions que (name - nom) (date of birth - née) (sexe - de sexe) (nationality - et de nationalité)

[passport number] whose signature follows ^③ Jane Mary Doe
 (national identification document, if applicable - document d'identification nationale, le cas échéant) dont la signature suit

has on the date indicated been vaccinated or received prophylaxis against ^④ Yellow Fever in accordance with the International Health Regulations.
 a été vaccinée/ ou a reçu une prophylaxie à la date indiquée (name of disease or condition - nom de la maladie ou de l'affection) conformément au Règlement sanitaire international.

Vaccine or prophylaxis Vaccin ou agent prophylactique	Date	Signature and professional status of supervising clinician Signature et titre du professionnel de santé responsable	Manufacturer and batch no. of vaccine or prophylaxis Fabricant du vaccin ou de l'agent prophylactique et numéro du lot	Certificate valid from: until: Certificat valable à partir du : jusqu'au :	Official stamp of the administering center Cachet officiel du centre habilité
^④ Yellow Fever	^⑤ 15 June 2018	^⑥ John M. Smith, MD	[Batch (or lot) #]	^⑦ 25 June 2018; life of person vaccinated	[⑧]



Logistics of travel vaccines

- “But we don’t carry them!”
 - That is okay!
 - Know where to refer to in your region
 - Reach out to the Immunization Unit if unsure
- Cost
 - Some providers will have patients pre-pay and then will order in vaccines needed
 - Common with rabies, JE, and TBE vaccines
 - IPV is only available in a multi-dose vial
- Insurance reimbursement
 - Typically, commercial insurance will not pay for travel consultation costs (visit fees, vaccines, etc.)
 - Many clinics will not bill insurance and require out-of-pocket payment

Questions?



**“So I leave in 3 days
for...”**

Last minute travelers & immunizations

Last minute travelers & immunizations

- Routine vaccines
 - If not up to date, provide first or additional doses of vaccine
- Recommended travel vaccines
 - Hep A and polio: single doses will initiate some protection if the full series cannot be completed before travel
 - Hep B
 - Consider utilizing accelerated schedules for EnergixB or Twinrix
 - Consider Heplisav-B for adults, which has a 0, 1 month schedule
 - Japanese encephalitis
 - Travelers who cannot complete the series >1 week before travel should be counseled to adhere rigorously to mosquito precautions
 - Rabies
 - Those receiving incomplete series who are then exposed to rabies should receive the same post-exposure treatment as an unimmunized person

Last minute travelers & immunizations

- Required travel vaccines
 - Yellow Fever
 - Certificates are valid 10 days after vaccine administration
 - It may be necessary to rearrange the order of travel or reschedule the trip
 - Can be denied at the border entry if the country has a yellow fever vaccination requirement
 - MenACWY for Hajj/Umrah
 - Saudi Arabia will not issue visas without proof of receiving the MenACWY vaccine at least 10 days before arriving
 - Polio
 - Certain countries require departing travelers to show proof of polio vaccination if they have been in the country >4 weeks
 - This should not impact last-minute travelers, but it may be easier to obtain the needed booster dose before departing from the U.S.

Resources

CDC Travelers' Health Website

- cdc.gov/travel
 - Travel advisories/alerts
 - Destination information
 - Disease directory
 - Clinic database
 - Resources for travelers and clinicians
 - Yellow Book

CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Travelers' Health

Happy Holidays

Holiday Travel
No matter your destination, learn tips that can help you have a healthy and safe holiday travel season.
[Learn more](#)

Destinations

Where are you going?
-- Select One --
[Go](#)
[View all destinations](#)

Travelers

[Find a Clinic](#)
[Advice for Travelers](#)
[Disease Directory](#)
[Frequently Asked Questions](#)

Highlights

- [Cholera Information for Health Care Professionals](#)
- [COVID-19 Travel Information](#)
- [Travel Industry Resources](#)

[More](#)

Travel Health Notices

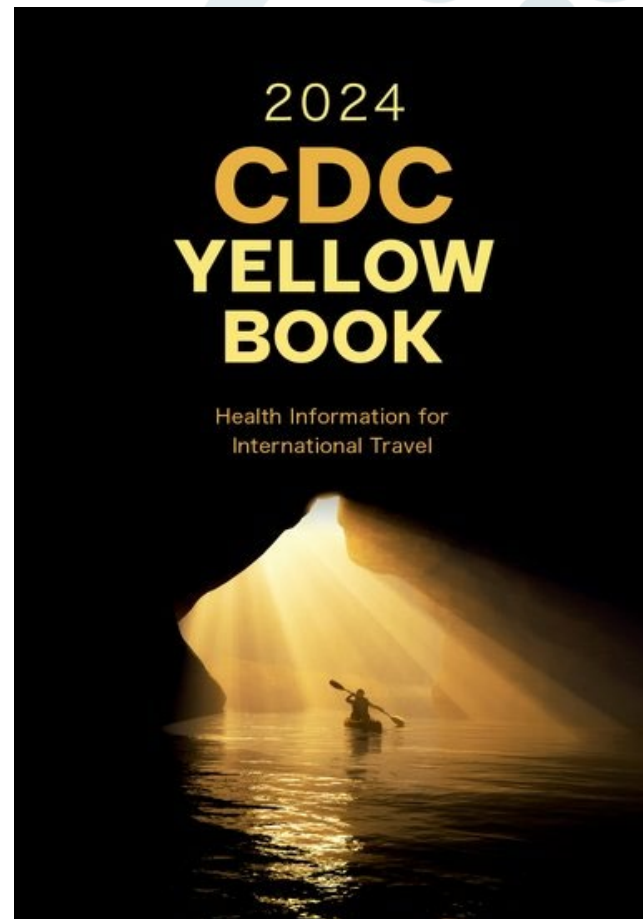
See the full list of [Travel Health Notices](#), including:

Warning Level 3, Avoid Nonessential Travel

[Health Infrastructure Breakdown in Venezuela](#)
September 30, 2021

CDC Yellow Book

- *CDC Health Information for International Travel*
- Updated every two years
- U.S. government's most current travel health guidelines
- Available:
 - Online at cdc.gov/travel
 - Major online booksellers



Pre-Travel Providers' Rapid Evaluation Portal

- <https://gten.travel/prep/prep>
- Free clinical tool to guide travel medicine recommendations

MASSACHUSETTS GENERAL HOSPITAL
Global TravEpiNet
A National Consortium of Travel Health Providers

Pre-Travel Providers' Rapid Evaluation Portal (Pre-Travel PREP)

Welcome to Pre-travel PREP! Pre-Travel PREP is a free clinical tool that guides you through preparing a US traveler for a safe and healthy international trip. It was developed to act as an interactive [Yellow Book \(Health Information for International Travel\)](#), and its output is based on the recommendations of the [US Centers for Disease Control and Prevention](#). PREP is continuously updated as new recommendations arise. Its development is supported by the Massachusetts General Hospital and the CDC.

1 Provider information

Please provide information about yourself:

* Indicates a required question

Which of the following best describes you? *

Which of the following best describes your type of practice? *

Please provide your US ZIP code (use "99999" if not in US): *

If you do not practice in the U.S., please select your country:

☐ Use a cookie to store the previous answers

2 Traveler information

Please provide information about the traveler:

How old is the traveler? *

years (for children < 1 year, please enter age in months: months)

What is the traveler's sex? *

☐ Male ☐ Female

Where is the traveler going? *

Please indicate if the traveler fits into any of the following categories (select all that apply):

☐ Returning home to visit family or friends (VFR)

☐ Study abroad / student traveler

☐ Interventionist aid or health care worker

Your friendly neighborhood Nurse Consultant

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Questions?





Thank you!

