Travel Medicine in the Age of COVID

September 8, 2023

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Virginia Mason Franciscan Health™

Disclosure Statement:

No relevant financial relationships with ineligible companies to disclose.

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Objectives

1. Familiarize with risk for travelers in various circumstances and how to discuss with the traveler
2. Develop recommendations for traveler's pre-trip planning and preparations
3. Identify resources for country-specific requirements with regard to COVID testing, how to access COVID testing and treatment in the US and abroad, how to obtain appropriate medical treatment for serious illness while away from home
4. Consider special needs of child travelers

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Travel Risk Assessment

- Itinerary
  - Countries and specific regions, including order of countries if > 1 country
  - Outbreaks at destination
  - Rural or urban destinations
- Timing
  - Season of travel
  - Time to departure
  - Trip duration

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Travel Risk Assessment

Reason for travel

- Adoption
- Adventure
- Business
- Education or research
- Medical tourism (seeking health care)
- Pilgrimage
- Tourism
- Visiting friends and relatives
- Volunteer, missionary or aid work

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Travel Risk Assessment

Travel style

- Accommodations (ex. Camping/tent, dormitory, guest house, hostel/budget hotel, local home or host family, tourist/luxury hotel)
- “Adventurous” eating
- Level of hygiene at destination
- Modes of transportation
- Traveler risk tolerance
- Travel with children

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Immunizations

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Vaccinations

Routine vaccination

- Tdap
- MMR
- Influenza
- Hepatitis A and B
- Polio
- Meningococcal
- HPV
- VZV
- Pneumococcal

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Estimated incidence per month of vaccine preventable diseases in lower-income countries among nonimmune Western travelers

Influenza: 1% (1/100)

Animal bite with rabies risk, latent tuberculosis infection: 0.1-1% (1/1000-1/100)

Typhoid in South Asia, Measles, Pertussis, Hepatitis A: 0.01-0.1% (1/1000-1/10,000)

Tick borne encephalitis in rural Baltics, hepatitis B, typhoid in Africa and south America, Active tuberculosis 0.001-0.01% (1/10,000-1/100,000)

Typhoid in Caribbean and Central America 0.0001-0.001% (1/100,000-1/million)

Japanese encephalitis (1/million)

Meningococcal disease, poliomyelitis, cholera, yellow fever (1 in 1-10 million)

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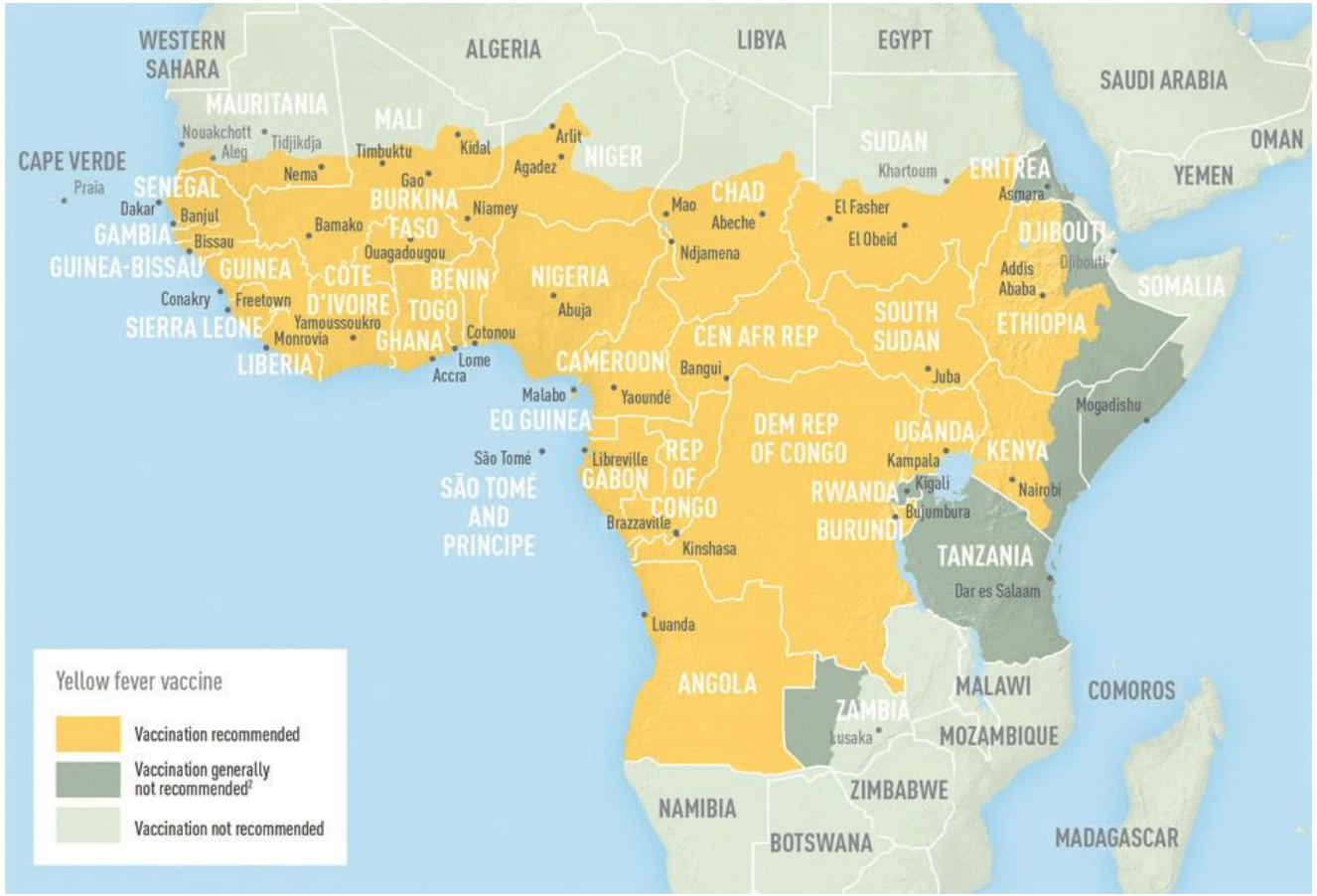
Yellow fever



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https://www.cdc.gov/yellowfever/maps/index.html

Yellow Fever Vaccine

- Entry requirements for proof of vaccination under the International Health Regulations
- Recommended for all travelers ≥ 9 months old going to areas with YF risk
- 1 dose of YF vaccine provides long-lasting protection
  - Booster
    - Pregnant when receiving initial dose
    - Hematopoietic stem cell transplant after receiving vaccine
    - Infected with HIV

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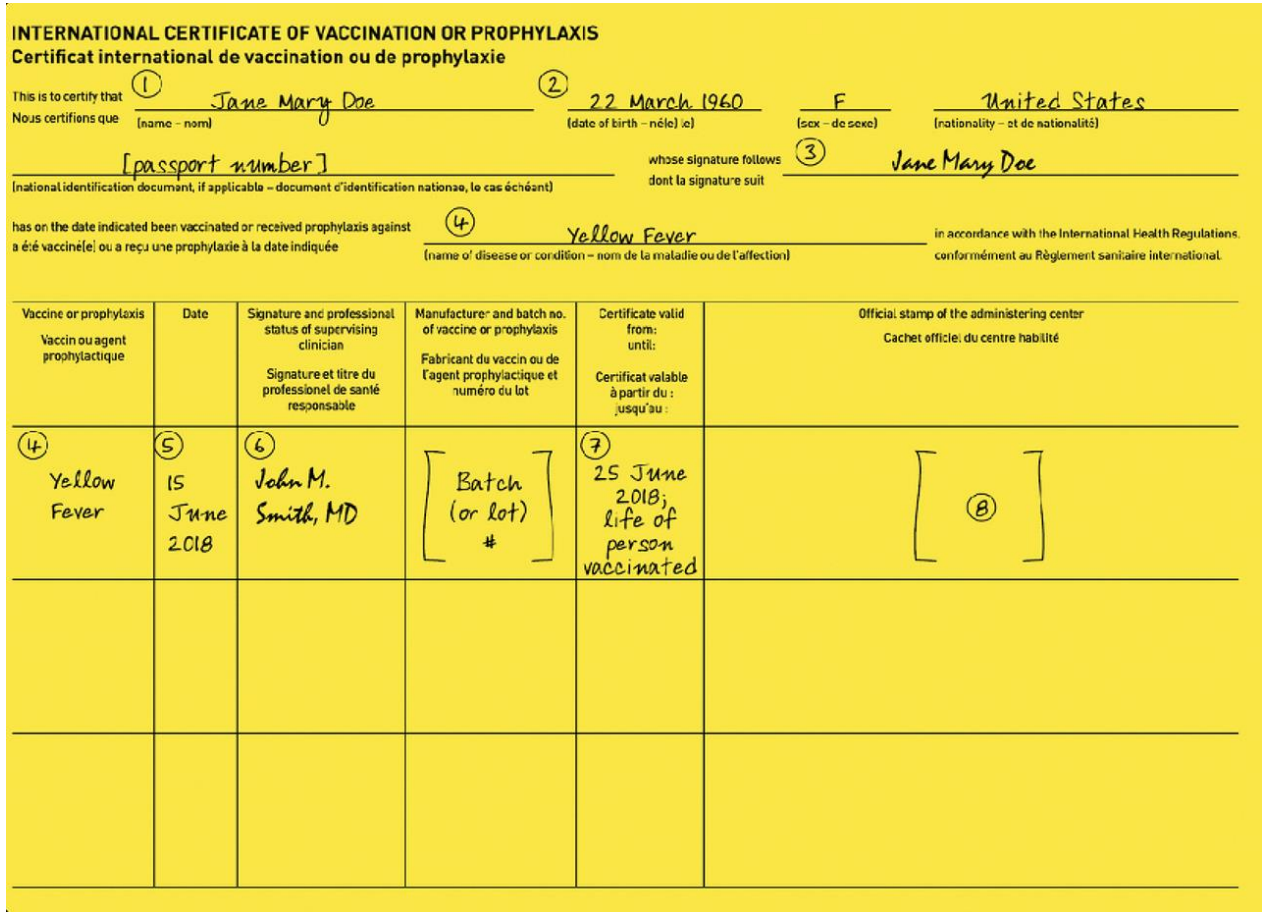
Yellow Fever Card



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

This is to certify that (1) Jane Mary Doe (name – nom)
Nous certifions que

(2) 22 March 1960 (date of birth – née) (o)
F (sex – de sexe)
United States (nationality – et de nationalité)

[passport number] (national identification document, if applicable – document d'identification nationae, le cas échéant)

whose signature follows (3) Jane Mary Doe
dont la signature suit

has on the date indicated been vaccinated or received prophylaxis against (4) Yellow Fever (name of disease or condition – nom de la maladie ou de l'affection)
a été vaccinée) ou a reçu une prophylaxie à la date indiquée

in accordance with the International Health Regulations.
conformément au Règlement sanitaire international.

Vaccine or prophylaxis Vaccin ou agent prophylactique	Date	Signature and professional status of supervising clinician Signature et titre du professionel 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)]

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Yellow fever vaccine-associated neurologic disease

- Acute disseminated encephalomyelitis, Guillain-Barre syndrome, meningoencephalitis or cranial nerve palsies
- Onset 2-56 days following vaccination
- Rarely fatal
- 0.8 per 100,000 doses administered (2.2 per 100,000 doses administered in age ≥60 years

Yellow fever vaccine-associated viscerotropic disease

- Severe illness similar to yellow fever disease
- Multiorgan failure with case fatality rate of 48%
- Median onset 4 days after vaccination (1-18 days)
- 0.3 cases per 100,000 doses of vaccine
- 1.2 cases per 100,000 doses for age ≥ 60

Yellow fever vaccine contraindications

- Age ≤ 6 months
- Allergy to vaccine component (chicken protein, eggs, egg products, gelatin)
- HIV infection (symptomatic) or CD4 <200/mL (or <15% of total lymphocytes)
- Primary immunodeficiencies
- Immunosuppressive and immunomodulatory therapies
- Malignant neoplasms
- Thymus disorder associated with abnormal immune cell function
- Transplantation

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Yellow fever vaccine precautions

- Age 6-8 months
- Age ≥ 60 years
- Breastfeeding
- HIV infection (asymptomatic) and CD4 T lymphocyte counts 200-499/mL (or 15-24% of total lymphocytes)
- Pregnancy

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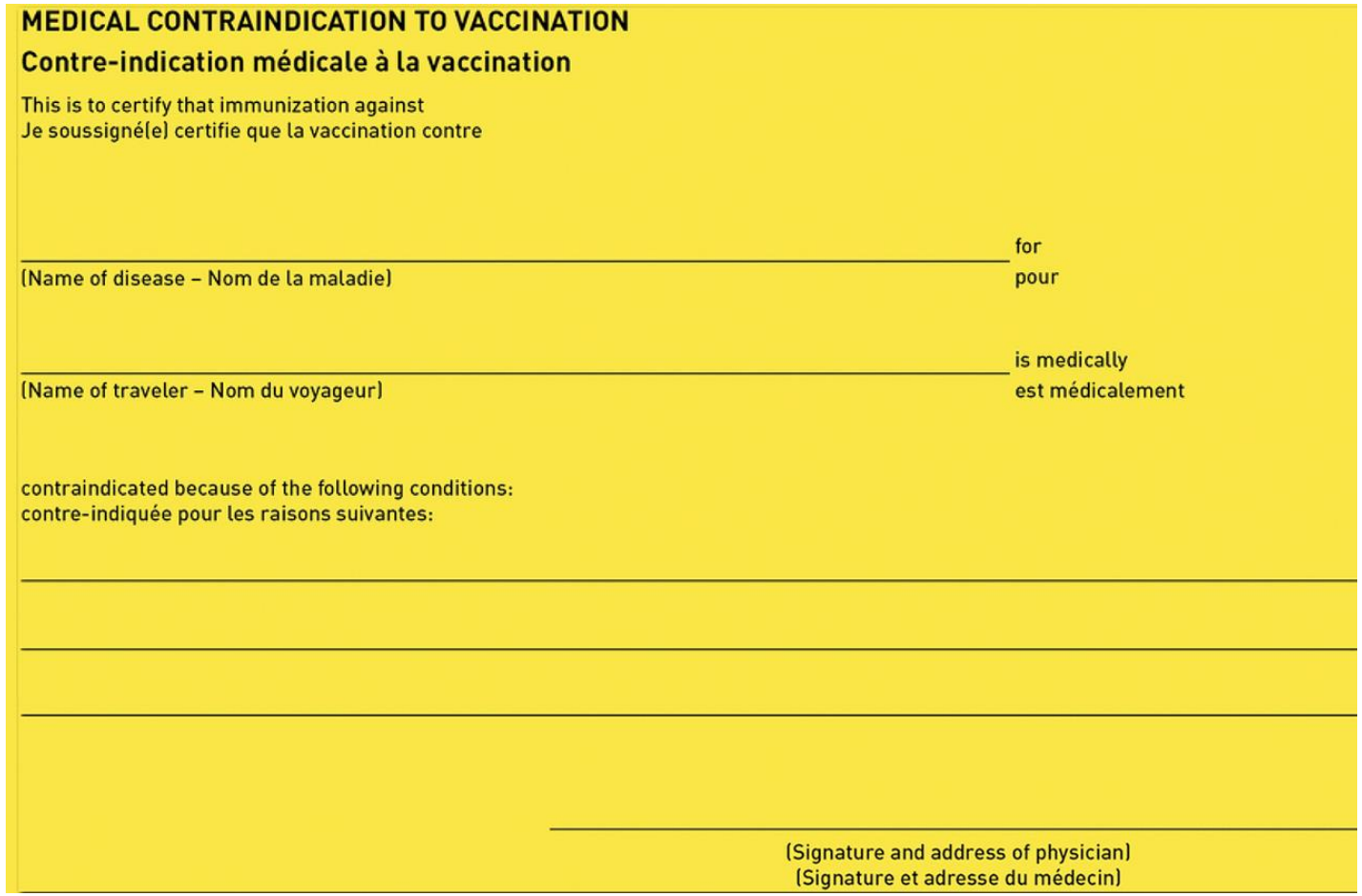
Medical Contraindication to Vaccination



MEDICAL CONTRAINDICATION TO VACCINATION

Contre-indication médicale à la vaccination

This is to certify that immunization against
Je soussigné(e) certifie que la vaccination contre

_____ for
(Name of disease – Nom de la maladie) pour

_____ is medically
(Name of traveler – Nom du voyageur) est médicalement

contraindicated because of the following conditions:
contre-indiquée pour les raisons suivantes:

_____

_____

_____

_____
(Signature and address of physician)
(Signature et adresse du médecin)

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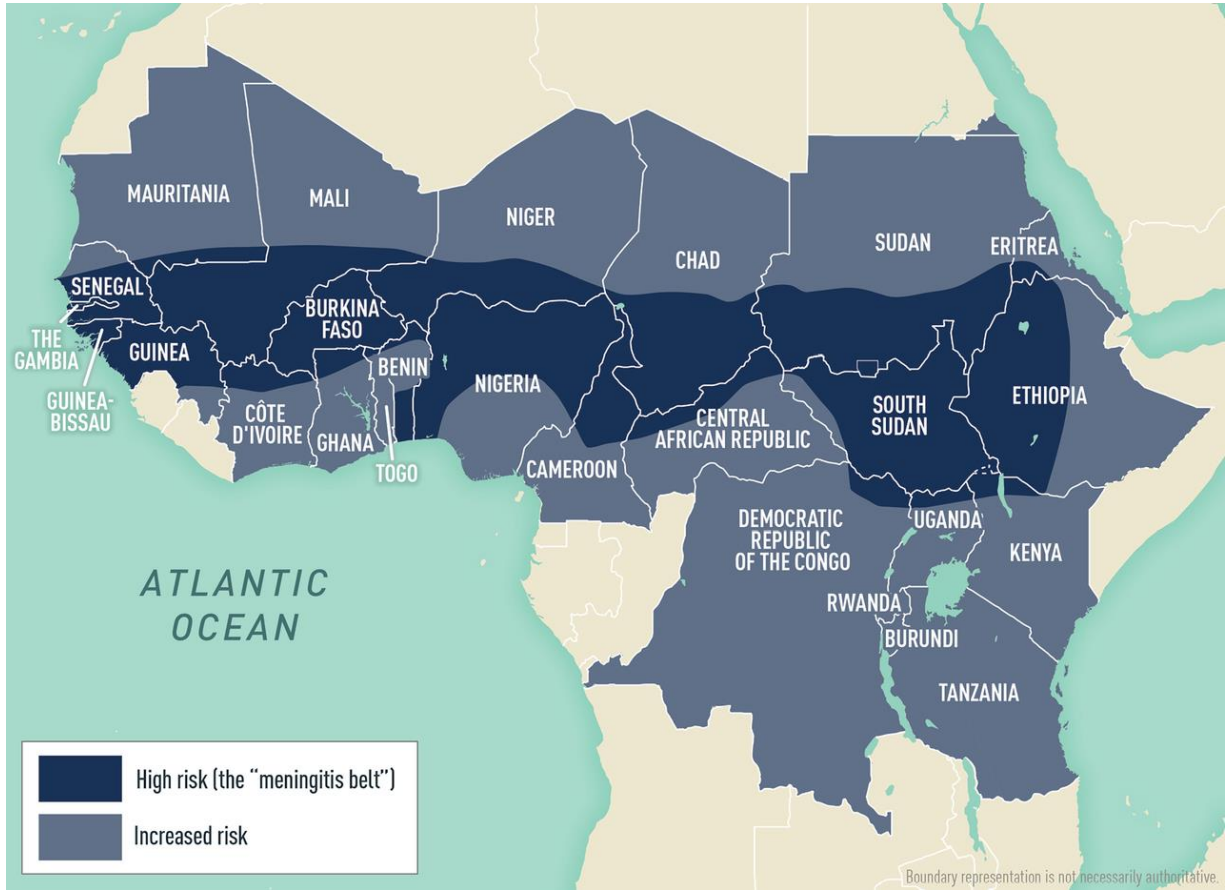
https://wwwnc.cdc.gov/travel/yellowbook/2024/infections-diseases/yellow-fever

Meningococcal vaccine



- Most risk during dry season:
  December to June
- Quadrivalent conjugate vaccine

- Saudi Arabia require polysaccharide vaccine for travelers making the Umrah or Hajj pilgrimage 10 days and ≤ 3 years before arrival

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https://wwwnc.cdc.gov/travel/yellowbook/2024/infections-diseases/meningococcal-disease

Typhoid vaccine

- Oral, live attenuated vaccine for age 6 and above, every 5 years if needed
  - 1 capsule every other day for 4 doses
  - Complete 1 week before travel
  - Refrigerate capsules
  - Complete 1 week before travel
  - No antibiotics for 72 hours after completion
- IM polysaccharide vaccine for age 2 and older evey 2 years if needed
- 50-80% effective

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2024 CDC Yellow Book

Japanese encephalitis

Mosquito borne illness

<1 case per million travelers

2 shot series:
Day 0, 7-28 days for 18-64 years
Booster considered after 1 year of vaccine

https://www.cdc.gov/japaneseencephalitis/maps/index.html

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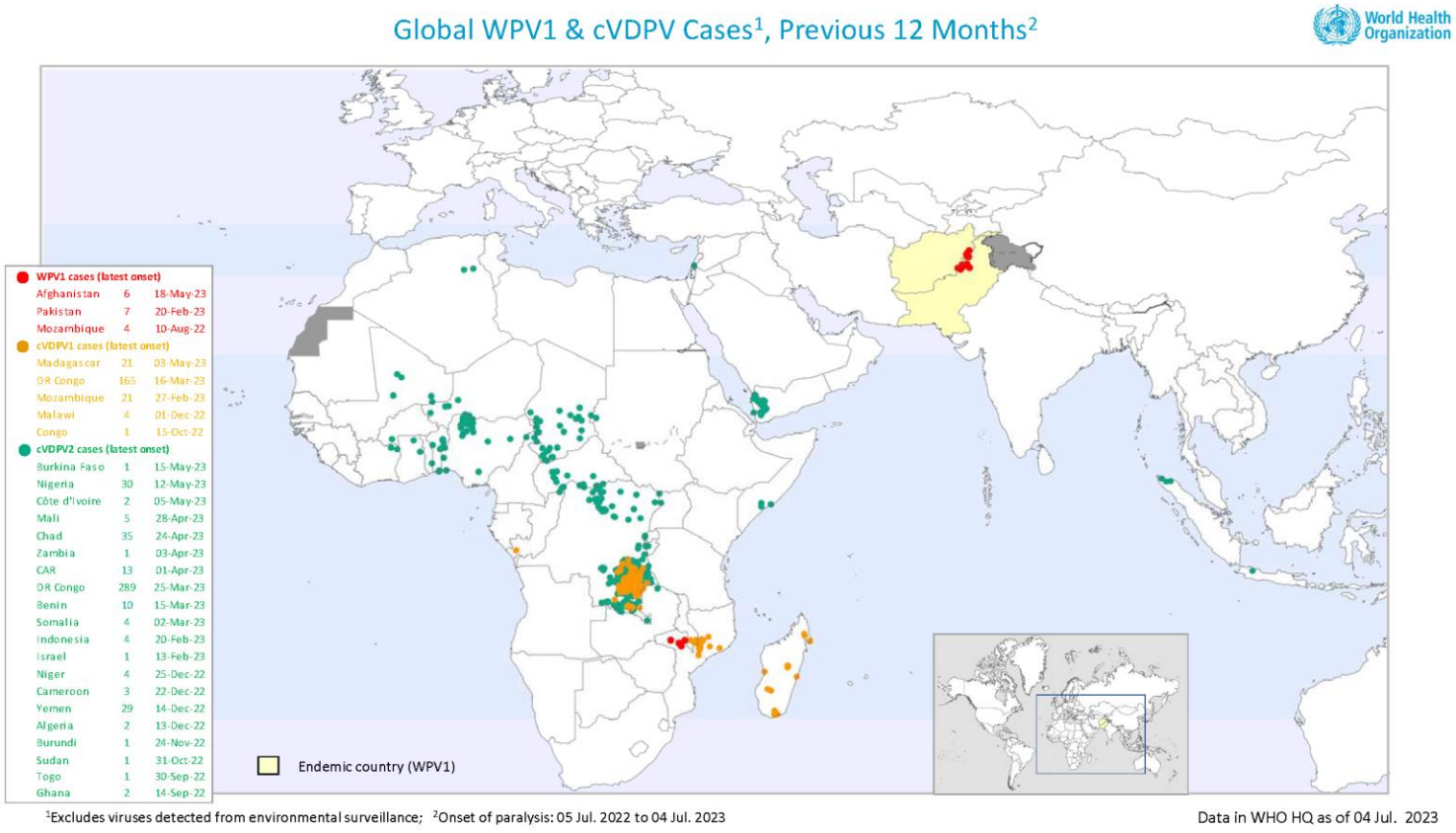
Polio



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https://polioeradication.org/polio-today/polio-now/

Hepatitis A

Most common vaccine-preventable infections acquired during travel

2 shot series: 0, >6 months

Boosters not recommended

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Rabies

Fatal, acute progressive encephalomyelitis

All mammals are susceptible: Mainly dogs and bats

Vaccine schedule

Preexposure prophylaxis: 0, 7 days (no longer 21-28 days for travelers)

If bitten or scratched, clean the wound with copious amounts of soap and water, povidone iodine or other products with virucidal activity.

Preexposure vaccine: Vaccines at Day 0 and 3

No preexposure vaccine:

Rabies immunoglobulins and vaccines at (0, 3, 7, 14) 28 if immunocompromised

Tick Borne Encephalitis

Western and northern Europe, extending to northern and eastern Asia

Spring and summer months

Indications

- Adventurous eaters
- Expatriates living in endemic area
- Travelers participating in outdoor activities in forested areas

https://www.cdc.gov/tick-borne-encephalitis/geographic-distribution/index.html

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Tick Borne Encephalitis Vaccine

Approved in August 2021

3 shot series for adults 16 and older

- Day 0, 14 days to 3 months, 5-12 months
- 4th dose could be given at least 3 years after completion of primary series

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Malaria prevention

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Malaria Prophylaxis

A: Awareness of Risk

B: Bite Prevention

C: Chemoprophylaxis

D: Diagnosis-early detection

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Awareness of Risk

Traveler Categories at Greatest Risk for Exposure and Infection

- Children
- Long-term travelers and expatriates
- Pregnant travelers
- Travel to Sub-Saharan Africa
- No use of chemoprophylaxis
- Travelers visiting friends and relatives in areas with malaria

https://wwwnc.cdc.gov/travel/yellowbook/2024/infections-diseases/malaria

Locally Acquired Malaria Cases Identified in the United States

Print

Distributed via the CDC Health Alert Network
June 26, 2023, 5:00 PM ET
CDCHAN-00494

Summary

The Centers for Disease Control and Prevention (CDC) is issuing this Health Alert Network (HAN) Health Advisory to share information and notify clinicians, public health authorities, and the public about—

1. Identification of locally acquired malaria cases (*P. vivax*) in two U.S. states (Florida [4] and Texas [1]) within the last 2 months,
2. Concern for a potential rise in imported malaria cases associated with increased international travel in summer 2023, and
3. Need to plan for rapid access to IV artesunate, which is the first-line treatment for severe malaria in the United States.

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https://emergency.cdc.gov/han/2023/han00494.asp

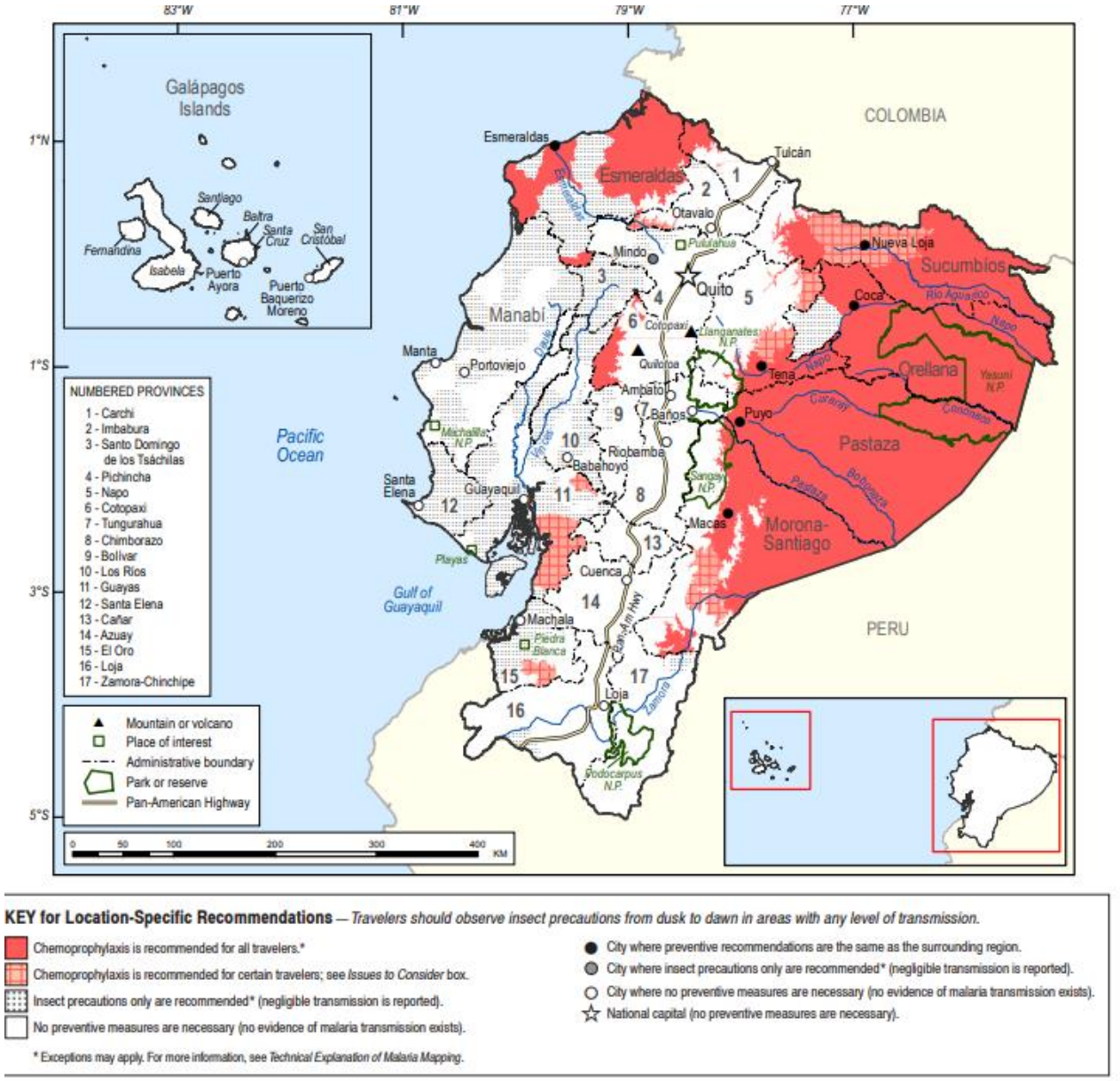
Ecuador: CDC Yellow Book

- Areas <1500 m (5000 feet) elevation in the provinces of Carchi, Cotopaxi, Esmeraldas, Morona-Santiago, Orellana, Pastaza and Sucumbios
- Rare cases <1500m (5000 feet) in all other provinces
- No malaria transmission in the cities of Guayaquil or Quito (the capital)
- No malaria transmission on the Galapagos Islands

https://wwwnc.cdc.gov/travel/yellowbook/2024/preparing/yellow-fever-vaccine-malaria-prevention-by-country/ecuador#seldyfm1118

Ecuador

Travax



KEY for Location-Specific Recommendations — *Travelers should observe insect precautions from dusk to dawn in areas with any level of transmission.*

- Chemoprophylaxis is recommended for all travelers.*
- Chemoprophylaxis is recommended for certain travelers; see *Issues to Consider* box.
- Insect precautions only are recommended* (negligible transmission is reported).
- No preventive measures are necessary (no evidence of malaria transmission exists).

* Exceptions may apply. For more information, see *Technical Explanation of Malaria Mapping*.

- City where preventive recommendations are the same as the surrounding region.
- City where insect precautions only are recommended* (negligible transmission is reported).
- City where no preventive measures are necessary (no evidence of malaria transmission exists).
- National capital (no preventive measures are necessary).

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https://www.shoreland.com/downloads/pdf/ecuador-malaria-map_sample.pdf

Bite Avoidance Measures (Bite Prevention)

Sustained-release or controlled release formulation of DEET (20-50%) or Picardin (>20%)

Reapply often and when outdoors

Apply sunscreen prior to skin repellents

Wear long sleeve shirts, long pants and socks

Use permethrin treated clothing

Check for ticks

Sleep under long-lasting insecticide treated bed nets

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Chemoprophylaxis

Atovaquone-proguanil

Doxycycline

Chloroquine/hydroxychloroquine

Mefloquine

Tafenoquine

Primaquine

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Atovaquone-proguanil

Worldwide use

1 tab daily 1-2 days prior to travel, during travel then 7 days after travel

Highly effective and well tolerated

Take with food to minimize GI side effect

Bitter taste

Contraindicated when CrCl <30

Doxycycline

Worldwide use

Take 100mg daily: 1-2 days prior to travel, during travel and 28 days post travel

Covers rickettsial infection and leptospirosis

Least expensive

Good for long term travelers

Side effect profile: nausea, photosensitivity, esophagitis

Not during pregnancy or breast feeding

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Chloroquine and hydroxychloroquine

Only for Central America and Caribbean due to resistance

Dose weekly: 1-2 weeks pretravel, during travel and 4 weeks post travel

500mg weekly for chloroquine; 400mg weekly for hydroxychloroquine

Safe in pregnancy and with breast feeding

Avoid in liver disease, psoriasis and retinal disease

Mefloquine

Some resistant areas in Southeast Asia

Weekly dose: 1-2 weeks pretravel, during travel and 4 weeks post travel

Not for history of depression, psychosis, seizures, prolonged QT

May be used during pregnancy and breast feeding

Tafenoquine

FDA approved in July 2018

Needs G6PD testing

200mg daily x 3 days before trip, 200mg weekly then 1 dose after return

Only for >18 years old

Not during pregnancy

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Traveler’s diarrhea

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Travelers’ diarrhea

- 30-70% of travelers during 2 week period depending on destination and season of travel
- “boil it, cook it, peel it or forget it”
- Poor hygiene practices in local restaurants and underlying hygiene and sanitation infrastructure deficiencies are largest contributor
- Bacterial : 80-90%; virus: 5-15%; protozoal pathogens seen in long-term travelers

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Food and Water Precautions

- Avoid salads, uncooked vegetables, raw unpeeled fruits and unpasteurized fruit juices
- Food of animal origin including meat and eggs should be cooked thoroughly
- Least risk: fully cooked foods that are served hot and foods that travelers carefully prepare themselves
- Wash hands frequently
- Avoid tap water as well as ice made from tap water

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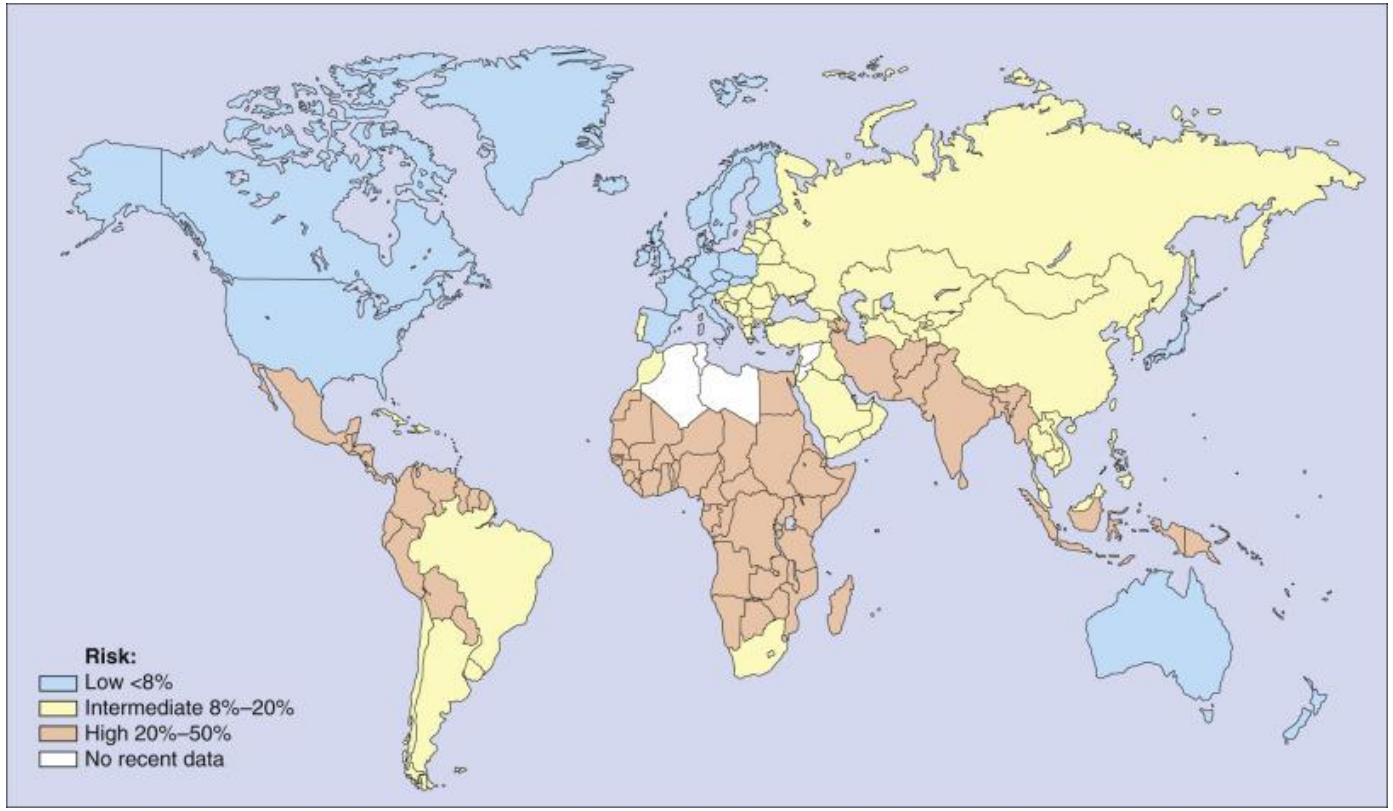
https://wwwnc.cdc.gov/travel/yellowbook/2024/preparing/food-and-water-precautions

Incidence rate of travelers' diarrhea



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Treatment

- Mild diarrhea: Tolerable, not distressing, does not interfere with planned activity: Antibiotic not recommended; consider bismuth subsalicylate or loperamide
- Moderate diarrhea: Distressing or interferes with planned activities

  Antibiotics can be used for treatment (Azithromycin, fluoroquinolones or rifaximin); Consider loperamide for use as monotherapy

2024 CDC Yellow Book

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Treatment

Severe Diarrhea: Incapacitating or completely prevents planned activities, all dysentery is considered severe

- Antibiotics advised: Azithromycin preferred; fluoroquinolones or rifaximin can be used for non-dysenteric diarrhea
- Antimotility agents not recommended as monotherapy for bloody diarrhea or diarrhea with fever

2024 CDC Yellow Book

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COVID

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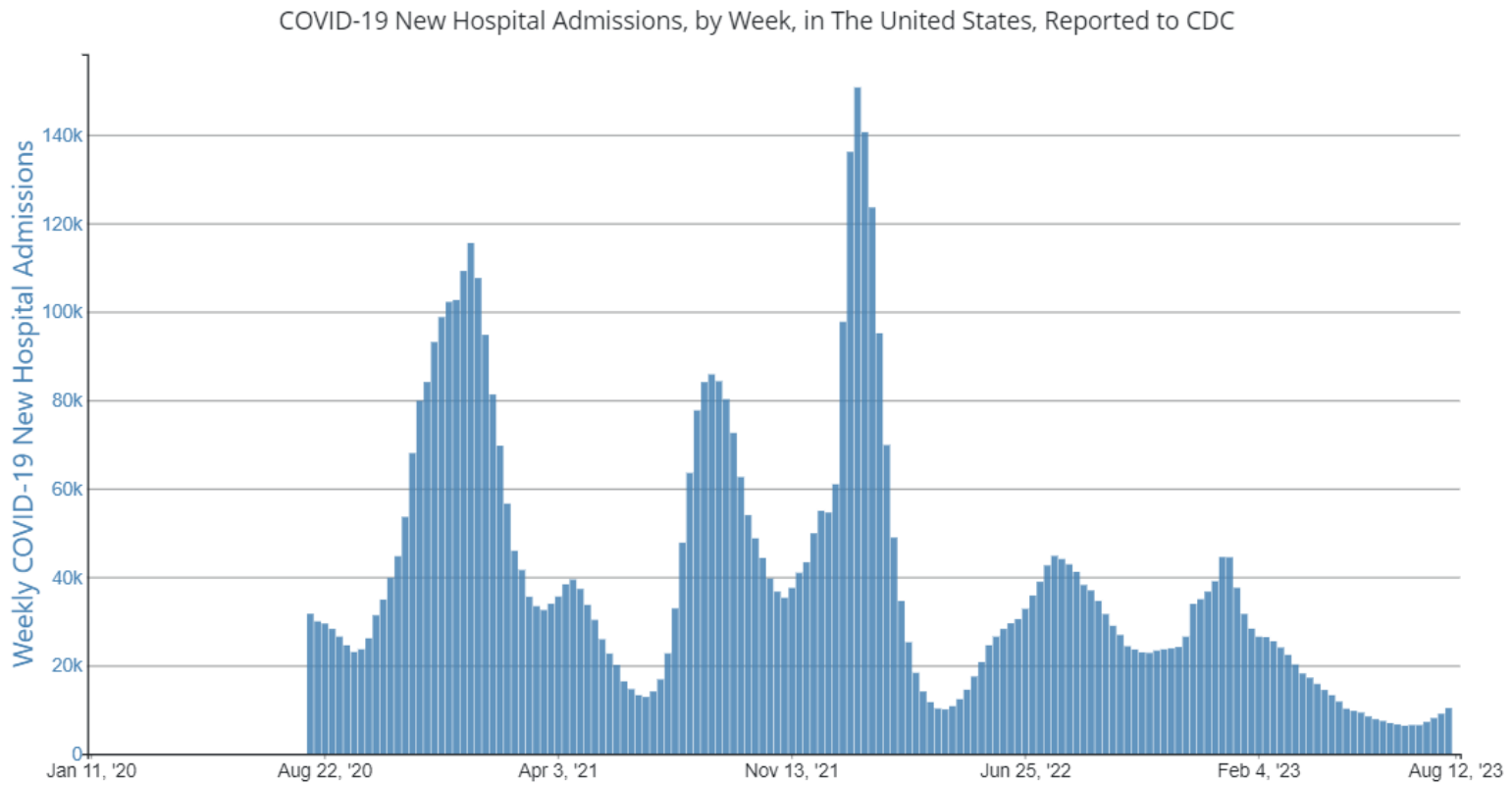
COVID-19 New Hospital Admissions by week



Centers for Disease Control and Prevention. COVID Data Tracker. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2023, August 19. https://covid.cdc.gov/covid-data-tracker

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COVID Variants

- Omicron EG.5 (Eris)
  - Most dominant subvariant (20.6% as of 3rd week of August)
  - One mutation in spike protein: potential for evading immunity acquired after infection or vaccination
- Moderna announced preliminary clinical trial data confirm that updated vaccine for fall 2023 showed significant boost in neutralizing antibodies against EG.5. and FL1.5.1 variants (8/17/2023)

https://investors.modernatx.com/news/news-details/2023/Moderna-Clinical-Trial-Data-Confirm-Its-Updated-COVID-19-Vaccine-Generates-Robust-Immune-Response-in-Humans-Against-Widely-Circulating-Variants/default.aspx

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COVID-19

Make sure vaccination is up to date

Risk factors of traveler for severe disease

Check COVID-19 status in visiting country

Bring test kits

Nirmatrevir and ritonavir?

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Traveling with children

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Vaccines

Vaccines: Routine and Travel vaccines

Age restrictions on vaccines

Minimum ages in the US

Yellow fever: 9 months

Hepatitis A 6 months

Typhoid: Injectable 2 years

Oral: 6 years

Influenza 6 months

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Refusal of recommended travel-related vaccines among U.S. International travelers in Global TravEpiNet

J Travel Med 2017 Jan;24(1); taw075

23,768 travelers eligible for at least one vaccine from July 2012 to June 2014

25% refused one or more vaccines

Providers documented reason for refusing vaccine

1. Cost concerns
2. Safety concerns
3. Not concerned with the illness

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Reason for refusing vaccines among travellers in the GTEN study population

Vaccines	Reason traveler refused vaccine		
	Not concerned with illness	Concerned with vaccine safety	Concerned with vaccine cost
Influenza	2851 (81%)	526(15%)	150(4%)
Meningococcal	1744 (78%)	311(14%)	177(8%)
Typhoid	1230 (73%)	171(10%)	289(17%)
Hepatitis A	1169 (73%)	245(15%)	184 (12%)
Tetanus	1140 (76%)	257 (17%)	101 (7%)
Polio	1098 (80%)	181 (13%)	88 (6%)
Rabies	3340 (78%)	421 (10%)	517 (12%)
Yellow fever	612 (67%)	225 (25%)	80 (9%)
Japanese encephalitis	460 (60%)	35 (5%)	266 (35%)

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J Travel Med 2017 Jan;24(1); taw075

Other tips

- Medications: provide liquid when possible
- Safety: bring car seats
- Medical kit: COVID test kit
  - Medical card with age, weight, medical history, allergies, blood type
  - Immunization records
  - OTC meds
    - Acetaminophen/ibuprofen, antihistamines
    - 1% hydrocortisone cream, antibacterial, antifungal ointment
    - Cough suppressant
    - Bismuth subsalicylate, loperamide

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Non-infectious counseling

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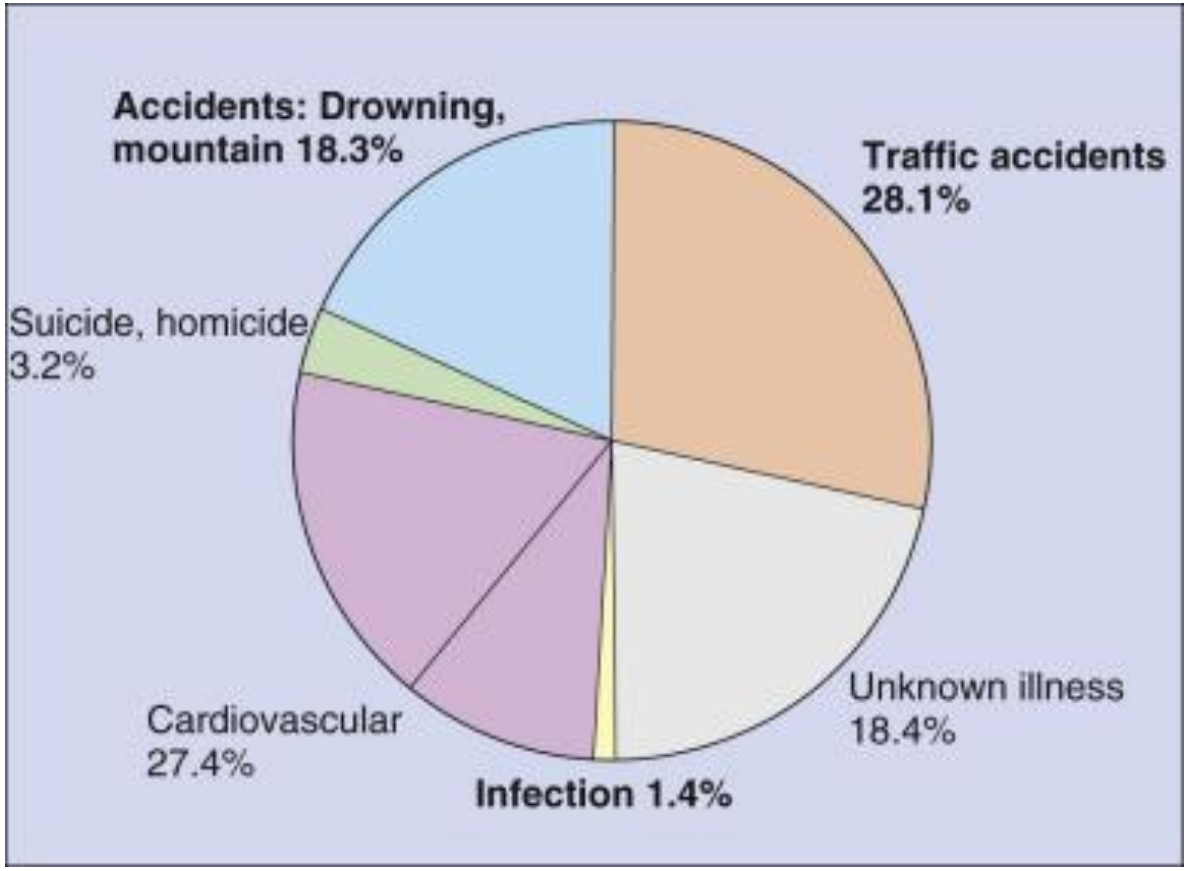
Fatalities among French abroad 2001-2004



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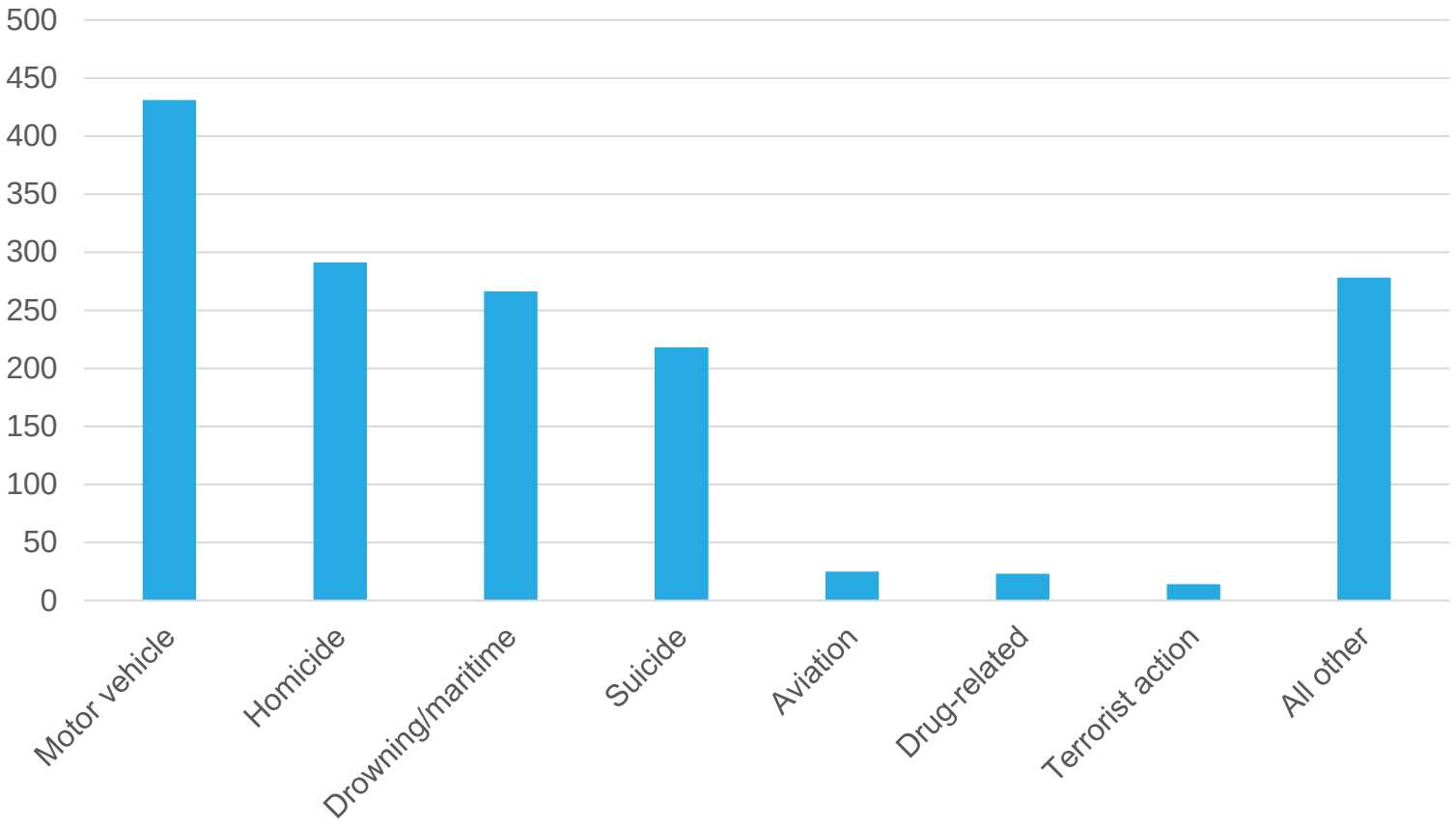
Leading cause of injury death for US citizens in foreign countries, 2016 &2017



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https://wwwnc.cdc.gov/travel/yellowbook/2024/environmental-hazards-risks/injury-and-trauma

Estimated incidence per month of vaccine preventable diseases in lower-income countries among nonimmune Western travelers

Influenza: 1% (1/100)

Animal bite with rabies risk, latent tuberculosis infection: 0.1-1% (1/1000-1/100)

Typhoid in South Asia, Measles, Pertussis, Hepatitis A: 0.01-0.1% (1/1000-1/10,000)

Tick borne encephalitis in rural Baltics, hepatitis B, typhoid in Africa and south America, Active tuberculosis 0.001-0.01% (1/10,000-1/100,000)

Typhoid in Caribbean and Central America 0.0001-0.001% (1/100,000-1/million)

Japanese encephalitis (1/million)

Rabies, meningococcal disease, poliomyelitis, cholera, yellow fever (1 in 1-10 million)

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Health Care Abroad

Medicare, Medicaid and most health insurance plans do not cover international medical care

- Travel insurance: lost baggage and trip cancellation
- Supplemental travel health and medical evacuation insurance

US Department of State (travel.state.gov/content/travel/en/international-travel/before-you-go/your-health-abroad/insurance-providers-overseas.html.)

International Association for Medical Assistance to Travelers (www.iamat.org)

US Travel Insurance Association (www.ustia.org)

American Association of Retired Persons (www.aarp.org)

https://wwwnc.cdc.gov/travel/yellowbook/2024/health-care-abroad/insurance

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Take Home points

- Review vaccines: Routine and travel vaccines
- Malaria prevention with medications/insect precaution
- Food/water precaution and travelers' diarrhea
- Non-infectious disease risk
- Medical kit
- Look into travel / medical evacuation insurance

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