



## Recommended Vaccines and Precautions

- **Hepatitis A**
  - Recommended for most travelers
- **Typhoid**
  - Recommended for most travelers
  - Visiting smaller cities, towns
  - Adventurous eating
- **Travelers' Diarrhea Precautions**
  - Recommended for all travelers
- **Mosquito Avoidance Precautions**
  - **Dengue Fever**
  - Mosquitoes biting day and night
  - Indoors and Outdoors

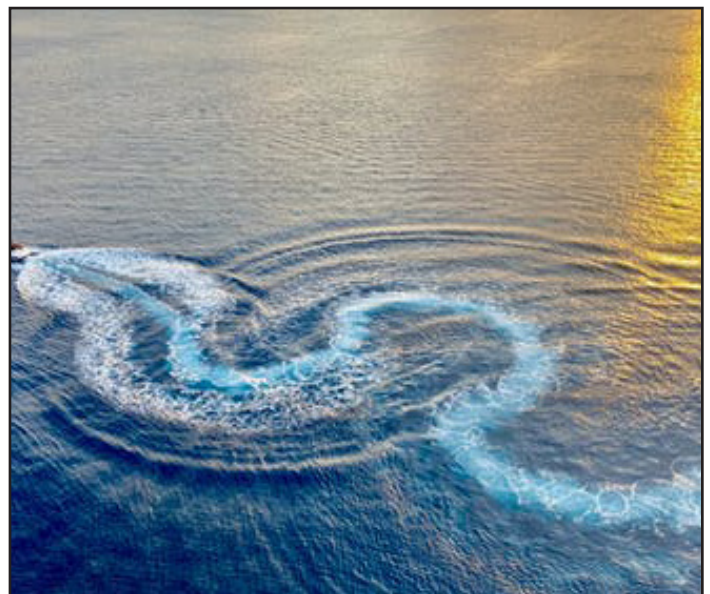


## Vaccines to Consider

- **Hepatitis B**
  - Recommended for those exposed to blood, body fluids or sexual contact
  - Exposed through medical treatment
- **Measles**
  - Infants 1 dose before travel
  - People 12 months or older with no evidence of immunity
  - People 12 months or older with 1 dose and no evidence of immunity; take 1 dose
- **Rabies**
  - Travelers' in contact with bats outdoors
  - Camping, hiking, biking, caverns

## Other Considerations

- **Influenza**
  - Yearly Flu Vaccine
  - COVID-19 Precautions





## Typhoid Fever

- Intense, life threatening illness
- Common in most non-industrialized regions

### Risk

- Off usual tourist routes; visiting family/friends
- Highest rate Indian subcontinent
- Food vendors (adventurous eaters)

### Symptoms

- High fever, weakness, stomach pain
- Sometimes rash of flat, rose-colored spots
- Complications such as intestinal bleeding

### Vaccine Prevention

- Oral vaccine, 4 doses
  - \* Refrigerate/complete 7-10 days before leave
  - \* 6 years and older
  - \* Booster every 5 years
  - \* Live vaccine; no if pregnant or immunocompromised
  - \* No antibiotics within 72 hours
- Injectable vaccine
  - \* Complete at least 14 days before exposure
  - \* Booster every 2 years
  - \* 50-80% effective
  - \* 2 years and older

### Antibiotic Treatment

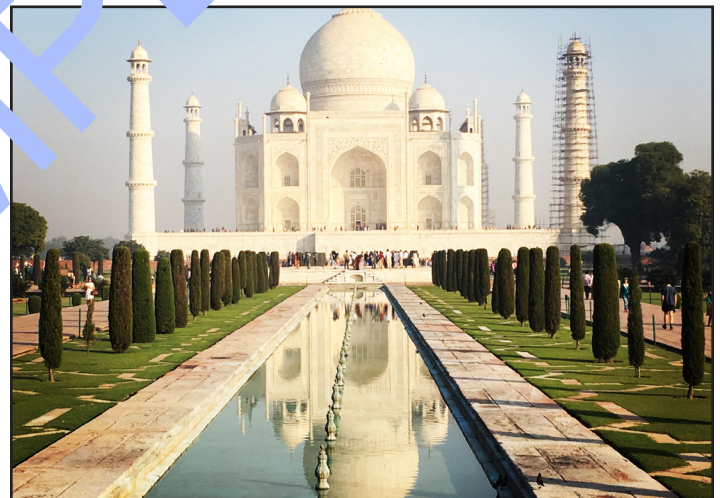
- Ciprofloxacin (some resistance India)
- Ceftriaxone antibiotic injection
- Shortens illness and risk of death

## Hepatitis A

- Common virus related to cleanliness/sanitation
- Preventable with vaccine
- Vaccine is 2 dose series (6 months after first)
- 1 dose = 95-100% protection; 2nd dose for long-term

## Polio

- Outbreaks in Afghanistan, Nigeria and Pakistan
- Precaution
- Adults should receive a dose of inactivated polio vaccine (IPV) if traveling to an outbreak area



## Environmental Contact Diseases

### Various worm/infections from fresh water

- Don't walk barefoot
- Don't swim in fresh water (saltwater okay)

### Tetanus

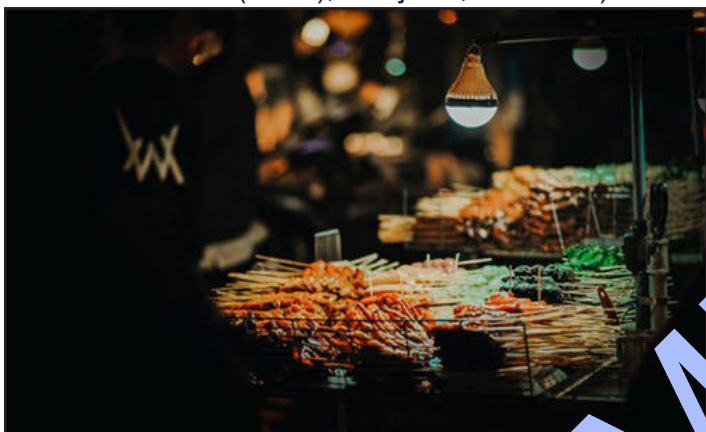
- Globally found in soil
- Update TDAP (tetanus, diphtheria and acellular pertussis) vaccine
- Every 10 years



### Water Precautions

#### Food and Beverage Selection

- **Low risk foods:** hot food, dry foods, peeled fruit, high sugar content, bottled carbonated water, sealed bottled water, boiled or treated with iodine and chlorine
- **High risk foods (to AVOID):** moist food and room temperature, fruits that cannot be peeled, milk, buffet foods, hot sauces on table, tap water, bottled water with no seal, food from street vendor, avoid foods washed or diluted with water (salad), fruit juice, ice cubes)



#### Water Disinfecting

- Boiling for 1 minute; slowly cool
- Two Step Process Best
- Purifiers and Filters
  - Filters do not remove bacteria and virus
  - Filter+halogenation (iodine+chlorine); 2-step
  - No iodine if pregnant
  - Vitamin C improves taste
- UV Radiation
  - Portable battery-operated units
  - Filtration + UV radiation; 2 step process

### Travelers' Diarrhea

- Most common condition
- Affects 30-70% travelers
- Symptoms from mild cramping to urgent loose stools to severe abdominal pain, fever, vomiting and bloody diarrhea

#### Risks

- **Low risk:** US, Canada, Australia, New Zealand, Japan, Northern/Western Europe
- **Intermediate risk:** Eastern Europe, South Africa, some Caribbean islands
- **High risk:** Most of Asia, Middle East, Africa, Mexico, Central/South America
- Backpackers, travelers in adventure tours
- Immunocompromised

#### What Causes It?

- Bacteria: 80-90%
- Virus and Protozoa: 10-20%

#### Treatment

##### Mild:

- loperamide (antimotility, symptomatic relief); OTC
- bismuth subsalicylate; need larger amounts

##### Moderate/Severe:

- azithromycin 1 gm x 1; or 500 mg x 3 days (antibiotic)
- hydrate
- +/- loperamide and bismuth subsalicylate
- Can be self-limiting 3-7 days (bacterial); 2-3 days (viral)
- Seek medical help if longer or bloody stools or fever
- Giardiasis (parasite)
  - backpackers and adventure travel
  - metronidazole or tinidazole will treat

#### Prevention Treatment

- Short term travelers at high risk
- Azithromycin, rifaximin as potential antibiotic options
  - resistance concerns some areas
- Bismuth subsalicylate
  - 2 ounces (60 ml) of liquid or 2 chewable tablets 4 times daily
  - Can cause black tongue/ stools
  - Contains aspirin so watch toxicity
- Hydration
  - Replace electrolytes (sports drink)
  - Use potable water
  - Avoid sweetened sodas (may make worse)



# Diseases Caused by Mosquitoes

## Mosquito Avoidance Precautions

- \* General avoidance
  - \* Air-conditioned lodging, netting, screen doors, insecticide sprays
- \* Insect proof clothing
  - \* Long-sleeved shirts, long pants, hats, tuck shirts in, pants tucked into socks, insecticide (permethrin) applied to clothing
- \* Where are you going?
  - \* Urban (cities) different exposure than rural (countryside)
- \* Insect repellants
  - DEET 25-55%
  - \* Best repellant
  - \* Can damage plastics
  - \* Picaridin
  - \* As effective as DEET
  - \* Biopesticides
  - \* Oil of lemon eucalyptus; shorter duration
- \* Factors affecting protection
  - \* Moisture (sweating, swimming)
  - \* Duration (must reapply)
    - \* Avoid sunscreen and repellent combos
    - \* Apply sunscreen first, then insecticide
  - \* Apply only to exposed areas
  - \* Do not spray into face, mouth, ears, eyes (spray hands and apply)
  - \* When return to indoors; wash off
  - \* Children < 2 months use clothing barriers
  - \* No lemon oil eucalyptus on children < 3yrs
- \* Permethrin
  - Treat clothing and gear
  - Sprayed or soaked for 24-48 hours
  - Does not damage clothing (odorless)
  - Works on flies, mosquitoes and ticks
  - Can wash clothes multiple times
  - Commercially available in clothing

## Malaria

- \* 1 million deaths annually
- \* Transmitted by mosquito
- \* Emergency treatment with atovaquone/proguanil
- \* Assess risk
- \* Region visited
- \* Sleeping arrangements
- \* Highest risk visiting friends and relatives

## Medication Prevention

- Medication before, during and after travel to malaria area
- Resistance patterns/considerations for selection

### Atovaquone-proguanil

- *Pros:* good for last minute travelers/shorter trips (take 1-2 days before, while there and 7 days after), daily medication, well tolerated
- *Cons:* Cannot be used by pregnant women/ breastfeeding/ children < 5 kg, cannot be taken by people with renal impairment, may cause stomach pain

### Chloroquine

- *Pros:* taken weekly, good for long trips, can be used in all trimesters when pregnant
- *Cons:* resistant areas, must take for 4 weeks after trip, start 1-2 weeks before trip, take with food, may cause dizziness, headache

### Doxycycline

- *Pros:* good for last minute (start 1-2 days before trip), less expensive
- *Cons:* cannot be used if pregnant or less than 8 years old, must take for 4 weeks after return, sun sensitivity, stomach upset

### Mefloquine

- *Pros:* Weekly medication, good for long trips, can be used during pregnancy
- *Cons:* resistance, cannot be used in patients w/ psychiatric conditions or seizure disorders, not good for persons w/ cardiac conduction issues, not good for last minute (must take 2 wks before trip), must take for 4 wks after trip

### Tafenoquine

- *Pros:* good for all resistance areas; start 3 days prior to travel and then take once weekly and continue for 1 dose after leaving area; well tolerated
- *Cons:* not used for pregnant women; not for children under 16 years old; women of child-bearing age should use effective contraception during and for 3 months after last dose; should not use with G6PD deficiency; do not use with current or past psychiatric disorders; give with food



# Diseases Caused by Mosquitoes

## Dengue Fever

- Virus transmitted by mosquitoes
- 50 million cases a year
- Can be in populated urban areas
- Common in Southeast Asia (Thailand), India, Pacific Islands, Caribbean
- Leading cause of fever illness and hospitalization among travelers returning from the tropics
- Mosquito Avoidance Precautions best prevention
- Symptoms
  - First infection usually mild
  - Next infection more severe
  - Defined
    - Fever illness with 2 or more of the following: headache, eye pain, muscle aches, joint pain, rash, bleeding or blood loss
    - Rash appears when fever stops, lasts 2-4 days
    - Symptoms can appear 2 weeks after bitten
- Treatment
  - Acetaminophen for fever (not aspirin or ibuprofen - chance for bleeding); max 3-4 grams/day
  - Hydration
  - Dengue Vaccine (Dengvaxia) approved for children 9-16 years old who live in dengue common areas with confirmed virus
    - 3 doses each 6 months apart
    - Used for potential subsequent severe infections



Chikungunya

- Virus transmitted by mosquitoes
- Bites during day and night; indoors and outdoors
- Often live around city buildings
- Symptoms
  - Fever and joint pain
  - Sometimes headache, muscle pain, joint swelling or rash
- Prevention
  - Mosquito Avoidance Precautions
- Treatment
  - Acetaminophen for fever; max 3-4 grams/day
  - Hydration
  - Rest

## Zika

- Virus transmitted by mosquitoes primarily
- Non-mosquito transfer
  - Mother-fetus
  - Sexual
    - Men use condoms
  - Blood transfusion
  - Laboratory exposure
- Symptoms
  - Rash in 90%
  - Arthritis like joint pain
  - Eye infection or eye pain
  - Muscle aches
  - Nausea/vomiting
  - Birth defect association
    - Microcephaly (small head)
- Prevention
  - Mosquito Avoidance Precautions
- Supportive treatment
  - Fluids - hydration
  - Treat symptoms
    - Fever and pain
    - Acetaminophen maximum 3-4 grams/day
    - Avoid aspirin and ibuprofen



## Yellow Fever

- Virus occurs in liver transmitted by mosquitoes (day biters)
- Sub-Saharan Africa and tropical South America
- 200,000 cases; 30,000 deaths annually
- First symptoms: flu-like
  - Headache, backache, muscle fatigue, nausea, vomiting
  - Most improve
  - 15% serious
  - 20-50% fatal
- Prevention
  - Mosquito Avoidance Precautions
  - Vaccine: 9 years or older may receive
    - Some countries require for entry
    - Only given at Yellow Fever Vaccination Centers
      - Receive approved certificate; must have proof for some countries (Africa, Central/South America)
      - Must receive at least 10 days before visit; must have approved stamp
      - Contact state health department for sites
      - Waiver can be issued; waiver cannot be personal/religious, must contact embassy or consulate
      - Check if going from endemic country to required country, might need vaccine/certificate to enter
      - Temporary Depletion of vaccine; May need to use Stamnil available in limited clinics
    - One dose per lifetime
      - Some countries still require 1 dose every 10 years;
      - CDC recommends repeat vaccination for:
        - Pregnancy
        - Stem cell transplant
        - HIV
        - Travelers with intense exposure
    - Live vaccine
      - Do not give: if less than 6 months, age, egg allergy, fever illness, thymus disease
      - Precaution: 60 years or older, pregnant, nursing, immunosuppression
      - Adverse effects: fever, headache, muscle aches may last 5-10 days



## Japanese Encephalitis

- Virus transmitted by mosquitoes
- Need extensive rural (farming) outdoor evening exposure
  - Rice fields and flooding
- Rare in travelers
- Clinical features
  - May not have many symptoms
  - May take up to 2 weeks to present anything
  - Death in 20-30% with encephalitis (brain swelling)
  - If survive, 30-50% have significant neurological issues
- Vaccine approved - Ixiaro
  - 17 years or older (0.5 ml)
  - Children 2 months-2 years (0.25 ml)
  - 2 dose series at 0 and 28 days
  - Must complete 1 week before travel
- Recommended if travel for more than 1 month with extensive outdoor activity during mosquito season



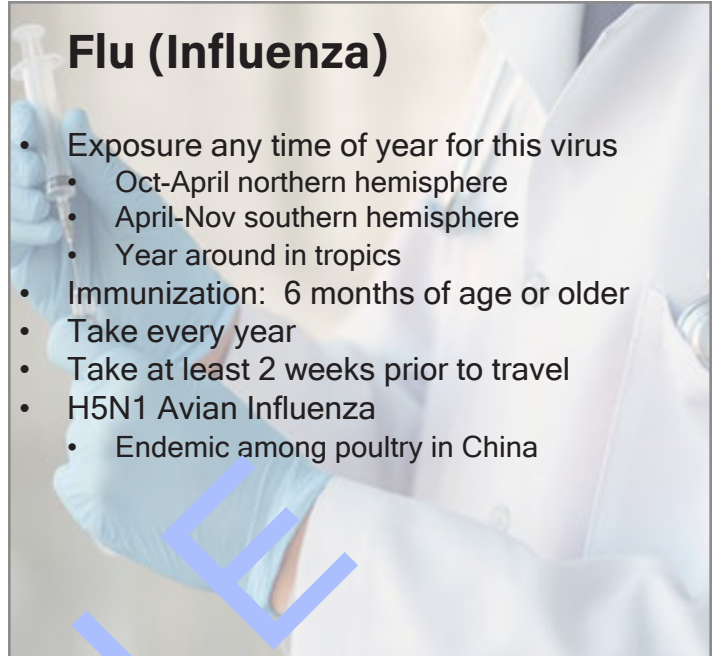
## Measles

- Highly contagious virus spread by respiratory droplets
- Travelers without immunity at risk
- Lapses in immunization rates increases cases
  - Children affected
  - 345,000 deaths annually
- Vaccine (MMR-Mumps, Measles, Rubella):
  - 2 doses (0 and after 28 days) adults
  - Traveling children unvaccinated: dose 1 at day 0; then can give dose 2 at 28 days (earliest)
- If previous disease or vaccination (2 doses), can take booster



## Flu (Influenza)

- Exposure any time of year for this virus
  - Oct-April northern hemisphere
  - April-Nov southern hemisphere
  - Year around in tropics
- Immunization: 6 months of age or older
- Take every year
- Take at least 2 weeks prior to travel
- H5N1 Avian Influenza
  - Endemic among poultry in China



## Hepatitis B

- \* virus transmitted through blood or sex
- \* Vaccine used for:
  - \* High risk area visiting
  - \* Health care workers
  - \* Sexual contact
  - \* Tattoos
  - \* Injuries/transfusions
  - \* Diabetes (19-59 years old)
  - \* Unvaccinated children less than 19 years
- \* Dosing Schedule
  - \* Unvaccinated person, 3 dose series
  - \* 0, 1-2 and 6 months
  - \* 1 or 2 doses provides some protection

## Hand, Foot and Mouth Disease

- \* Contagious disease caused by virus
- \* Distributed worldwide but outbreaks in Asia
- \* Usually affects children 5 years or under
- \* Symptoms
  - Fever, painful blister-like sores in mouth and rash that looks like blisters
  - Mild with usual recovery in 7-10 days





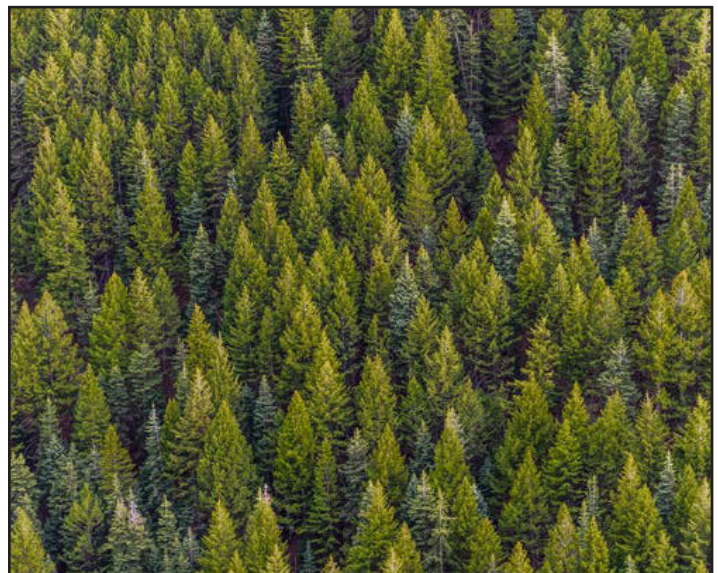
## Rabies

- Virus found in some animals
- Transmission from bite or scratch from rapid animal
  - Dogs, bats, cats, raccoons, opossums, skunks, foxes, jackals, mongoose
- Fatal viral disease
  - Starts with flu-like illness
  - Progress to severe neurological issues and death
  - Survival is rare
- Risk to travelers
  - Highest in activities such as camping or caving with exposure to wild or stray animals
  - High risk in rural (farming) areas with greater than 24 hours distance to medical services
  - Veterinary and animal workers at risk
  - Children at increased risk
- Prevention
  - Animal avoidance
  - Vaccine (Imovax, RabAvert)
    - 3 injection series (days 0,7,21 or 28)
- Recommendation for taking vaccine
  - Based on prevalence in area visiting
  - Activities doing
  - How long are you staying
  - Veterinarians, animal handlers, cavers, missionaries, field biologists
- Post-Exposure
  - Evaluate an animal bite/scratch medically within 2 days
  - If received the vaccine, get 2 boosters on days 0 and 3 after exposure
  - If did not receive vaccine, inject rabies immune globulin AND series of 4 injections of vaccine over 14 days



## Tickborne Encephalitis

- \* Virus Spread by tick bites
- \* May also contract from unpasteurized dairy products
- \* Risk only in small areas in Europe and Asia, mostly Russia
- \* Most cases in forested areas < 2500 ft (750 m)
- \* April - November most common; peaks in early and late summer
- \* Higher Risk activities and outdoor occupations
  - \* Camping, hiking, fishing, bicycling
- \* Prevention
  - \* Insect repellent - DEET 20% or more
  - \* Cover exposed skin
  - \* Permethrin treated clothing
  - \* Check for ticks
- \* Vaccine Available in Germany







## Sun Protection

- \* Sunburn risk
  - \* Closer to equator
  - \* 10 am - 4 pm greatest risk
  - \* Reflection from snow, sand, water
  - \* Travelers taking sun sensitive medications
- \* Prevention
  - \* Sun protective clothing
    - \* Hats, clothing, sunglasses, umbrella
  - Sunscreens and sunblock
  - \* UVA and UVB lotions



## High Altitude Illness

- Cold, low humidity, increased UV radiation, hypoxia
- Hypoxia can occur in destinations higher than 8000 ft (2500 m)
- **Acute Mountain Sickness**
  - Most common affecting 25% sleeping above 8000 ft
  - Occurs within 12 hours of arrival
  - Symptoms: headache, fatigue, loss of appetite, nausea/vomiting
  - Can resolve in 24-72 hours
  - Can progress if ascent continued
- **High Altitude Cerebral Edema**
  - Rare/severe progression of Acute Mountain Sickness
  - Symptoms: profound tiredness, drowsiness, confusion
  - Treatment: descend immediately
  - Death can occur within 24 hours if do not descend

## Jet Lag

- Disruption of sleep-wake cycle
- Among those who travel rapidly across 3 or greater time zones
  - More common traveling eastward
- Strategies to prevent Jet Lag
  - Begin shifting times for waking and going to bed before travel
    - Going east, get up earlier, bed earlier
    - Going west, get up later, bed later
  - Exposure to bright light
    - In evening when traveling west
    - In morning when traveling east
  - Exercise, healthy food, adequate rest, stay hydrated
- Treating Jet Lag
  - Melatonin (OTC) at bedtime
  - Short-acting hypnotics for sleep
    - Zolpidem, alprazolam, lorazepam (all Rx)
    - Watch interaction with alcohol
  - Hangover effect
  - Caffeine in the morning

## High Altitude Pulmonary Edema

- Can occur alone or along with Acute Mountain Sickness or High Altitude Cerebral Edema
- Initial symptom: increased breathlessness on exertion
- Progresses to: breathlessness at rest with weakness and cough, then pink frothy sputum
- Treatment: oxygen and/or immediate descent
- **Medications to prevent/treat**
  - Acetazolamide 125mg to 250mg started 1 day before ascent and continued until at least 2 days at highest altitude
    - Watch sulfa allergy
- **Other tips to acclimatization**
  - Ascend gradually
    - Do not go from low altitude to higher than 9000 ft sleeping altitude in 1 day
    - Above 9000 ft do not go higher than 1600 ft/day
    - Extra day for every 3300 ft
    - First 48 hours avoid alcohol and limit exercise
    - Have high-altitude exposure within 30 days prior to trip



## Travel Deaths

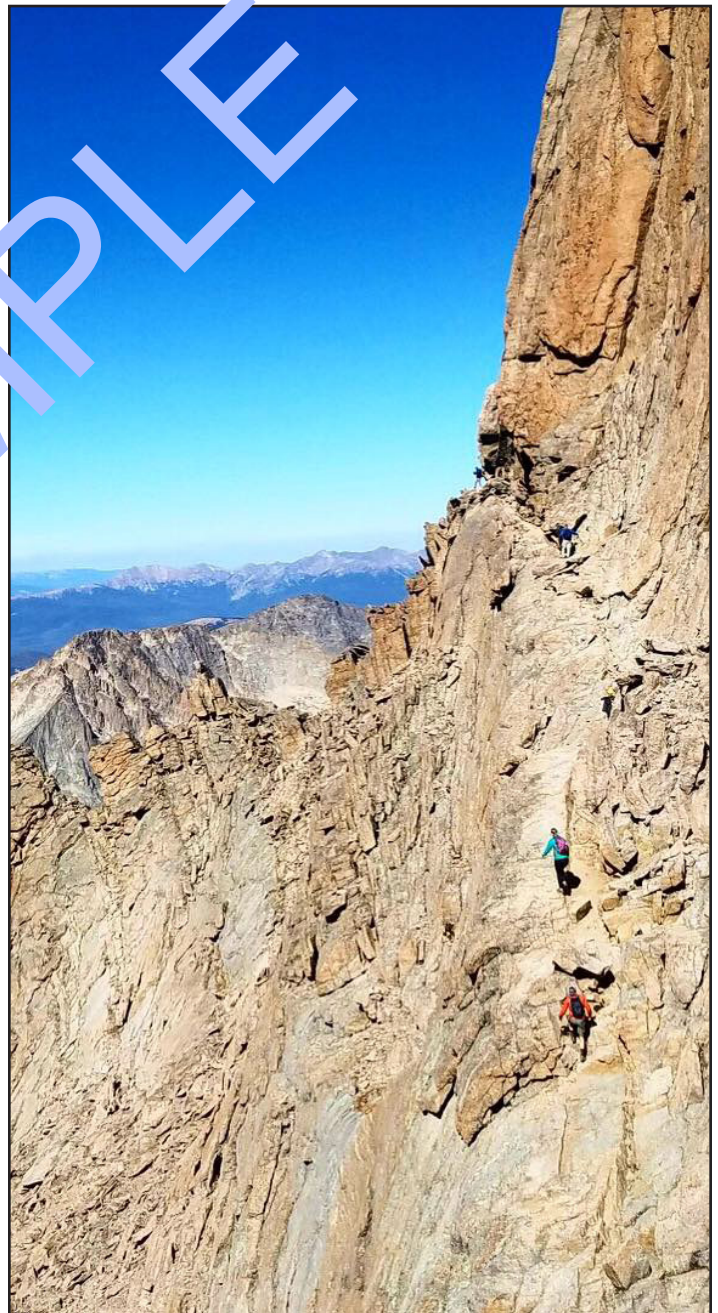
- More likely to die from injury than infection (10 times)
- Road travel accidents leading cause of death for travelers (32%)
  - Unfamiliar with area, language barriers, poor roads, risk-taking, no seatbelts
- Homicides 18%
  - Violence
  - US travelers can be targets
  - Travel with companion
  - Watch alcohol consumption
- Drowning 14%
  - Leading cause for US travelers where water recreation is major activity
  - Boating hazards
  - Alcohol consumption
  - Scuba diving risks
    - Ear barotrauma most common injury
    - Decompression illness
  - Wait 24 hours after dive before flying

## High Risk Activities

- \* Adventures
  - \* mountain climbing
  - \* whitewater rafting
  - \* kayaking
- \* Inadequate trauma care
- \* Medical facilities issues

## Motion Sickness

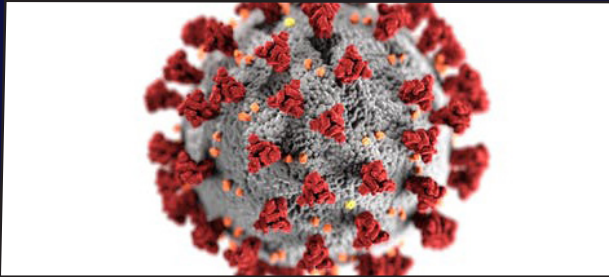
- \* More common
  - \* Children 2-12 years old
  - \* Women, especially pregnant, menstruating or on hormones
  - \* Migraine sufferers
- \* Prevention best option
  - \* Antihistamines
    - \* Meclizine (OTC), dimenhydrinate (OTC), promethazine (Rx)
    - \* Start 1 hour before needed
    - \* Can cause drowsiness, fatigue
  - \* Scopolamine patch (Rx)
    - \* Dry mouth, blurred vision, drowsiness
    - \* Start 4 hours before needed; lasts 72 hours
  - \* Good for cruise ships voyages
  - \* Ondansetron (Rx)
    - \* Used to stop nausea
    - \* Tablet or sublingual (under the tongue)
    - \* Quick acting





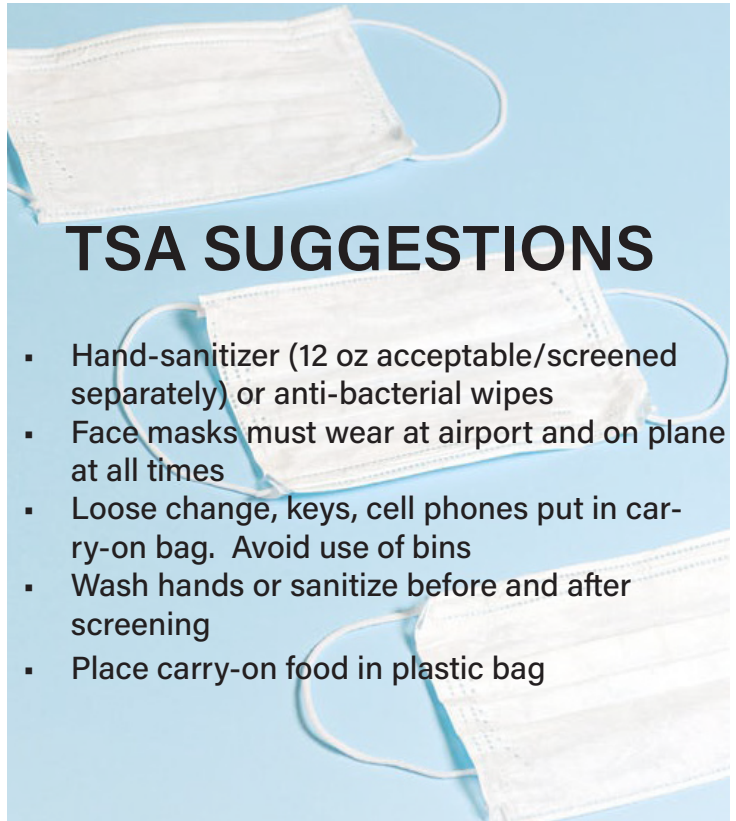
Travel Health Today

# COVID-19 CORONAVIRUS



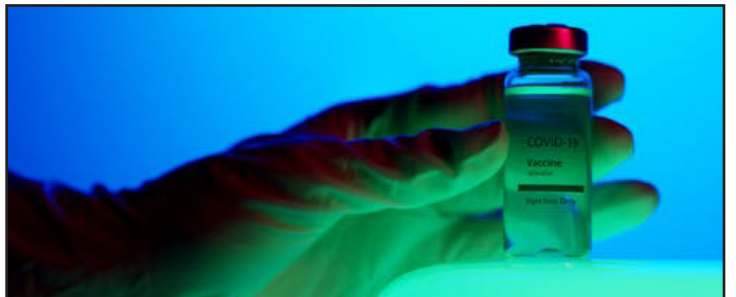
## Traveler Protection

- Use mobile device for check-in/boarding pass
- Avoid touching your eyes, nose or mouth with unwashed hands
- Wash your hands often with soap and water for 20 seconds
- Use alcohol-based hand sanitizer that contains at least 60% alcohol
- Avoid traveling if you are sick
- Wear a mask in public through airport and on plane
- Use sanitized wipes on seat, tray table and armrest
- Check as much baggage as possible
- Try to keep socially distant in airport and stay 6 feet away from others.
- Know the travel restrictions of your destination country. Some require a (-) Covid-19 viral test along with vaccination status. Some of this may be required by your airline.
- All international travelers should check with their destination and home state/province to determine rules, monitor their health, and practice social distancing.



## TSA SUGGESTIONS

- Hand-sanitizer (12 oz acceptable/screened separately) or anti-bacterial wipes
- Face masks must wear at airport and on plane at all times
- Loose change, keys, cell phones put in carry-on bag. Avoid use of bins
- Wash hands or sanitize before and after screening
- Place carry-on food in plastic bag



## Vaccinate Before You Travel

Covid-19 vaccines will protect you against coronavirus and variants

Pfizer/BioNTech	<ul style="list-style-type: none"> <li>• 2 doses at least 3 weeks apart</li> <li>• Fully vaccinated 2 weeks after 2nd dose</li> </ul>
Moderna	<ul style="list-style-type: none"> <li>• 2 doses at least 4 weeks apart</li> <li>• Fully vaccinated 2 weeks after 2nd dose</li> </ul>
Johnson & Johnson	<ul style="list-style-type: none"> <li>• 1 dose</li> <li>• Fully vaccinated 2 weeks after dose</li> </ul>