Pre-travel Counseling for Children, Adolescents & Adults

Angela Myers MD, MPH, FAAP, FPIDS
Division Director, Pediatric Infectious Diseases
Associate Professor of Pediatrics
Children's Mercy, Kansas City
UMKC SOM

Children's Mercy KANSAS CITY

UMKC School of Medicine

BEST CHILDREN'S HOSPITALS U.S.News & WORLD REPORT RANKED IN 10 SPECIALTIES 2017-18

MAGNET RECOGNIZED AMERICAN NURSES CREDENTIALING CENTER

Disclosures

- Neither I nor any member of my immediate family has a financial relationship or interest with any proprietary entity producing health care goods or services related to the content of this CME activity
- My content will not include discussion of commercial products or services
- I do not intend to discuss an unapproved /investigative use of commercial products/devices

Children's Mercy KANSAS CITY

Learning Objectives

- Analyze the travel specific risks associated with the chosen country or region of travel
- Develop an immunization plan to ensure the patient has received all necessary and recommended vaccinations prior to travel
- Provide age specific travel counseling for a child who is traveling with their family
- Provide age specific travel counseling for an adolescent who is traveling alone or with a group

Children's Mercy KANSAS CITY

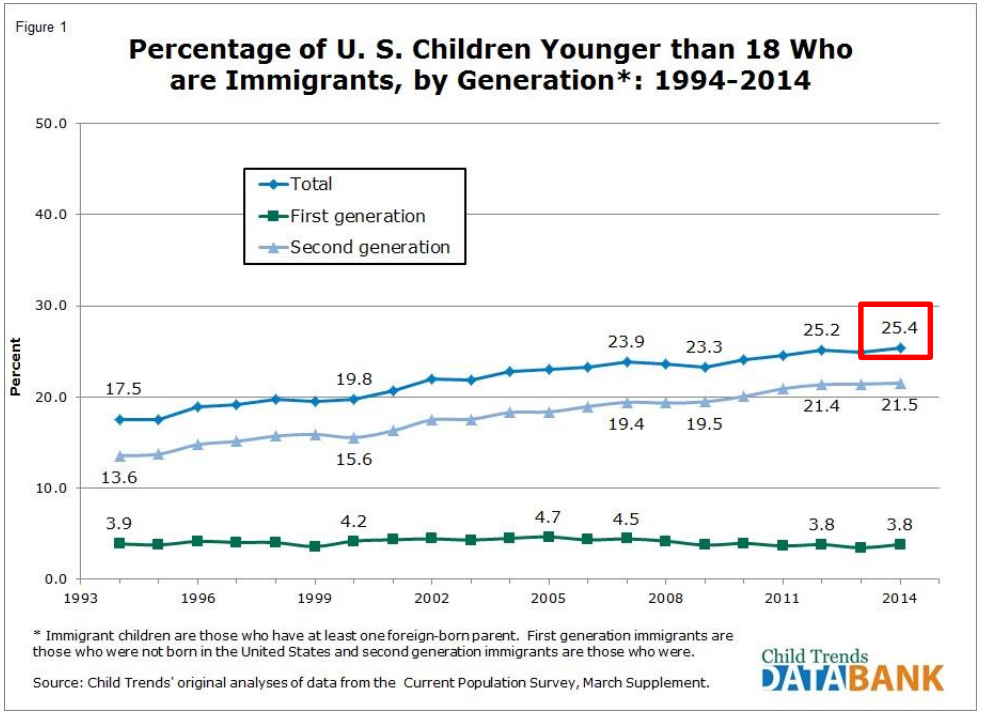
International Travel Increasing

- 1.2 billion in 2015
- Reasons for travel
  - Tourism 38%
  - Mission/volunteer/research/aid 24%
  - Visit Friends & Relatives 17%
  - Business 15%

MMWR Surveill Summ.2013 Jul 19;62:1-23.

Visiting Friends & Relatives

- Foreign born US population ~14%
- 26% of US population 1st or 2nd generation
- Highest morbidity from malaria and typhoid



https://www.childtrends.org/indicators/immigrant-children

Case 1

Ashley is a 19-year-old college student who is traveling with a group of friends to Peru, where they plan to stay in youth hostels, hike Machu Picchu, and visit the Incan ruins during summer break.

What general advice should you provide before her trip?

General Guidance

- PE avoidance (flights >4 hours)
  - Walk around every 2-3 hours
  - Stretch, compression socks
- Awareness of surroundings
  - Travel in groups; NEVER alone
- Transportation
  - Use registered taxis, avoid motor scooters & crowded buses

Animal Avoidance

- Never feed/pet a stray or wild animal
- If bitten or scratched by monkeys or stray dogs seek care immediately
  - Rabies vaccine & IG
- Evacuation insurance
  - Trauma and illness

High Altitude Travel

- Gradual ascent
  - Stay at 9,000 feet for a few days
  - Ascend no more than 1,600 feet/day
  - Plenty of fluids, no alcohol
  - Acetazolamide
- High altitude HACE
  - Confusion, loss of coordination, drowsiness
- High altitude pulmonary edema (HAPE)
  - Being out of breath, cough, weakness

Get to lower Ground!!!

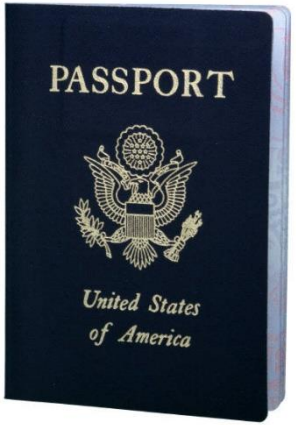
Adolescent Guidance

- Advise against a new sex partners while traveling
- Alcohol and Drugs
  - Easy access
  - Impair judgment
  - Do NOT accept anything from strangers
  - Stiffer penalties for possession
- Stick together!

Body Art

- Tattoo & piercing avoidance
  - Lack of regulations regarding equipment cleaning/sterilization
  - Risk of Hep B, Hep C & HIV
  - Risk of bacterial infection
- Black Henna tattoo avoidance
  - Skin reactions resulting in itching and pain
  - Scarring may occur

Passport Security



- Passport copies
  - Leave a copy at home with someone
  - Carry a copy with you
  - Lock passport in a safe
- Know where to find the phone number and general location of the American embassy
- Register your trip with the state department https://step.state.gov/step/

Smart Traveler Enrollment Program

Case 2

Neha and Samir are 5 & 9-year-old siblings who are traveling to India with their parents to attend a family wedding. They plan to be gone for 2 months and stay with relatives while there.

What advice should you provide regarding food and beverage precautions?

Food Born Illnesses

Food & Beverage Precautions

"Boil it, cook it, peel it or forget it"

Food No No's

- Street venders
- Leafy or uncooked vegetables
- Unpasteurized dairy products
- Raw or undercooked meat/fish
- Caution: buffets & sauces

What you should do

- Cater to foreigners
- Well cooked & hot
- Wash and peel yourself
- Breads, crackers & tortillas
- Canned foods

Beverage Precautions

What NOT to do:

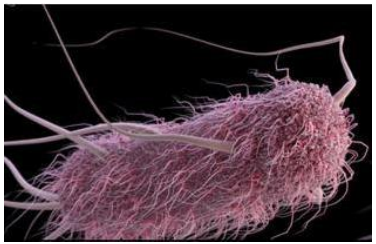
- Drink tap water or freshly squeezed juice
- Brush with tap water
- Use the ice

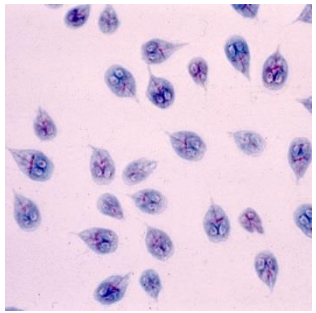
What to do:

- Bottled water & beverages
- Bottled must be sealed/dry
- Boil the water (1 min)
- Filter (0.2 micron)

Traveler's Diarrhea

- 40-60% travelers develop TD
  - 3 loose stools in 24 hours
  - Abrupt onset; lasts 3-4 days
- Transmission
  - Fecal-oral route
- Organisms
  - Bacteria: E. coli*, Campylobacter*, Shigella, Salmonella
  - Viruses: Norovirus
  - Protozoa: *Giardia*, *Cryptosporidium*, *E. histolytica*





TD Risk Factors

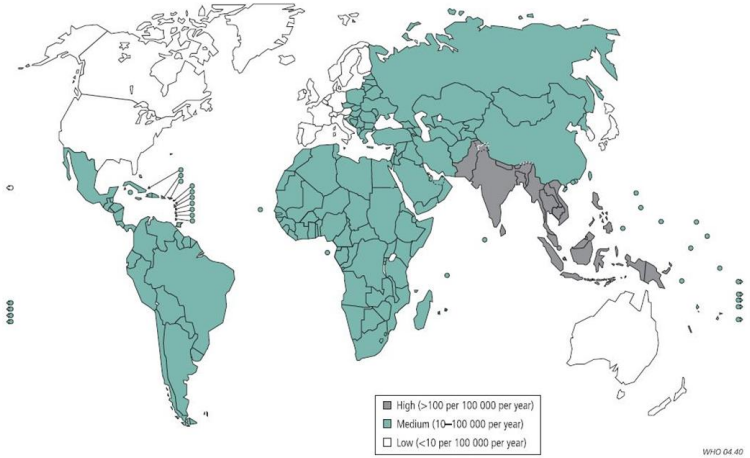
- Age
  - Toddlers
  - Adolescents
- Medical Issues
  - Immune suppression
  - Inflammatory bowel disease
  - Medications that decrease gastric acidity

Self Treatment

- Prevention
  - Pepto-Bismol® 2 tabs, 4 times daily
- Oral hydration
  - WHO approved ORS/ make your own
- Drug treatment
  - Antimotility medications (adults only)
  - Antibiotics – reserve for severe disease

Typhoid Fever

- Bacterial infection caused by *Salmonella typhi*
  - Fecal contamination of food and water
  - Person to person contact
- Symptoms develop over a month
  - Fatigue, headache, fever, abdominal pain, constipation
  - Rose spots & “pea soup” diarrhea late findings



Prevention

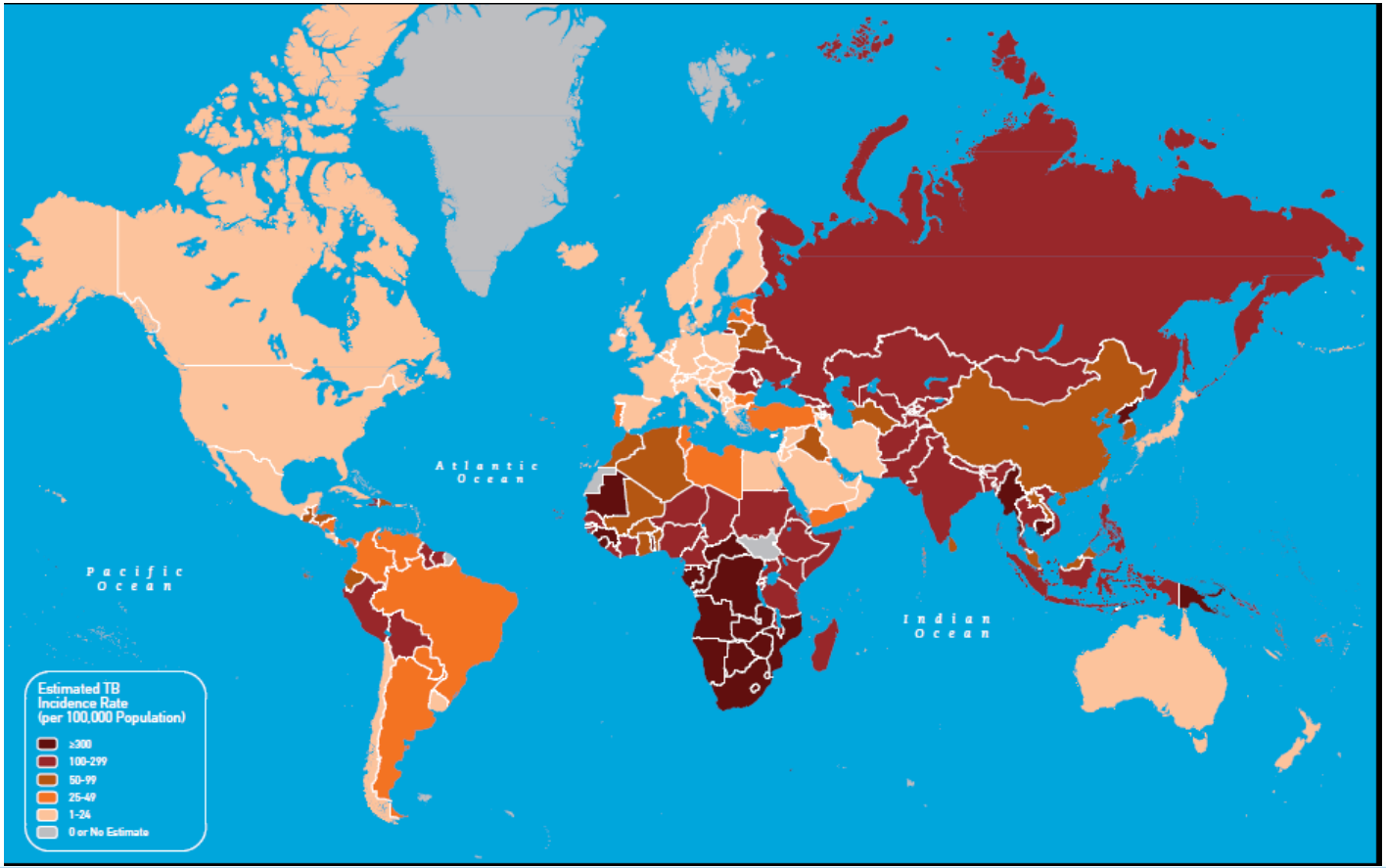
- Food and beverage precautions
- Vaccination not covered by insurance
  - Live oral vaccine – 5 years of protection
    - Must be ≥ 6yrs old
    - Intact GI tract & immune system
    - Avoid antibiotics
  - Injectable – 2 years of protection
    - Must be ≥ 2yr old

Case 2 cont.

The family also plans to travel around India using traditional modes of transportation including buses. Parents would like malaria prophylaxis for the kids (ages 5 and 9 yrs) as well.

What advice should you provide about TB and malaria prophylaxis?

Global TB Incidence



Tuberculosis

- Travel is a risk factor, but generally minimal
- Exceptions:
  - Extended stay travelers in an endemic country
  - Frequent or close contact in crowded places
  - Medical missionaries ≥1 month stay
- Pre-travel testing recommended
- TST or Quantiferon 8-10 weeks post return

Insect Precautions

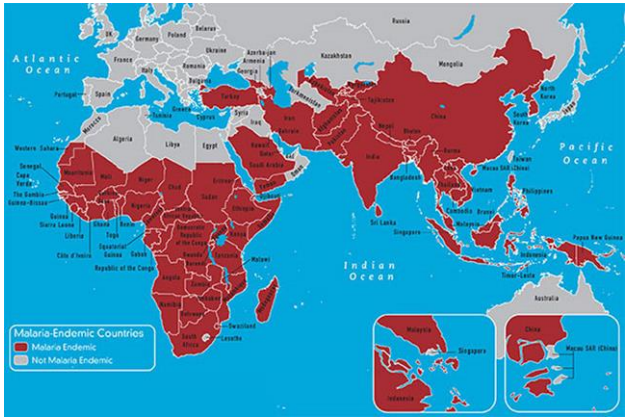
Children's Mercy
KANSAS CITY

Preventive Measures

- Long shirts and pants
- Insect repellants:
  - DEET, picardin, oil of lemon eucalyptus, products with IR3535
  - Higher concentration is better; must reapply every few hours
- Permethrin soaked clothes and bed nets
  - 6 weeks / 6 washings
- Sunscreen first; followed by repellent

Malaria epidemiology

- Malaria is present in over 100 countries
  - 350-500 million infections annually
- Transmitted by the *Anopheles* mosquito
  - Night feeders
- Infectious Agent
  - 4 species; *P. falciparum* is most serious & potentially lethal



Malaria - A Calculated Risk

- Relative risk in travelers
  - Highest: Africa and Oceania, South Asia & South America
  - Lower: Central America and other parts of Asia
- 1,700 reported cases in US annually
  - 10 fatalities
  - Most commonly *P. falciparum*
  - Mostly from sub-Saharan Africa; India highest country overall

Preventive Measures

- Mosquito avoidance
- Chemoprophylaxis
  - Taken before, during and after travel
    - Underlying medical conditions
    - Drug resistance
    - Side effects
    - Cost

Prophylaxis Options

- Atovaquone-Proguanil (Malarone)
  - + Short trips, last minute travelers
  - – $$$, not in setting of renal failure or pregnancy
- Mefloquine
  - + Long trips, inexpensive
  - – Psychotropic side effects, prolonged QT, black box warning
- Chloroquine
  - + Inexpensive, long trips, well tolerated
  - – Only use in certain countries due to resistance
- Doxycycline
  - + Short trips, inexpensive, replace acne meds
  - – Photosenstivity, esophagitis, vaginal yeast infections, age ≥8

Case 3

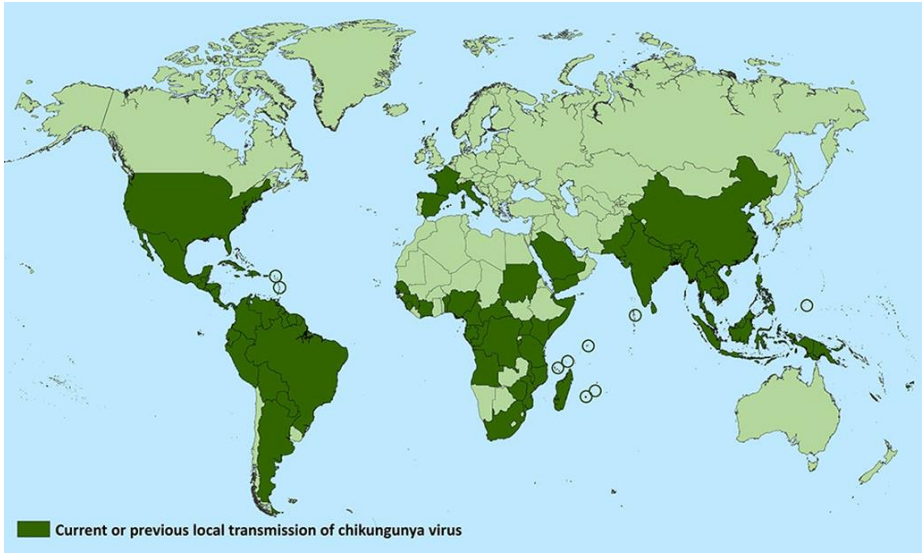
Emma and Jackson are 11 & 14 year old siblings who are traveling with their parents to Costa Rica for an ecotourism trip where they plan to zip line in the rainforest, kayak in a river estuary, and visit crocodiles and caimans.

They ask which mosquito born illnesses they should be aware of before their trip.

Chikungunya virus

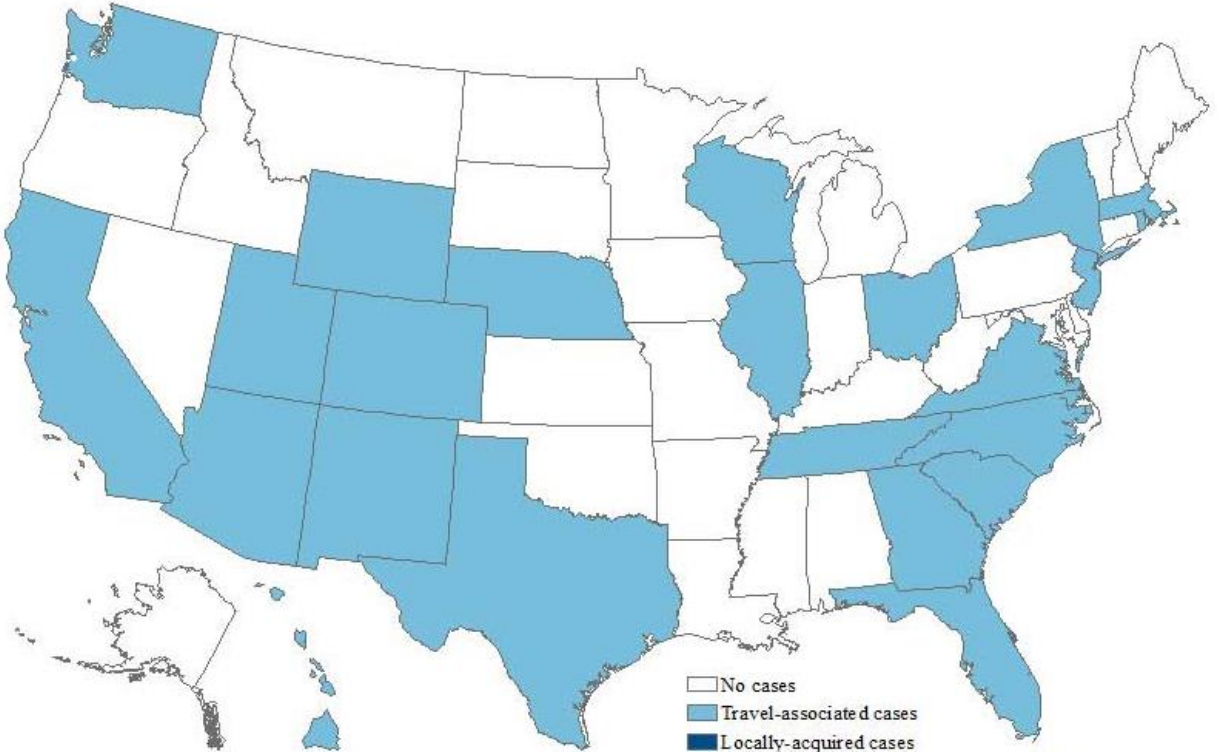
- Primarily transmitted by *Aedes* mosquito
- Sudden onset of high fever and joint pain
- Daytime biters

CDC



Reported countries and territories of cases as of Sept 17, 2019

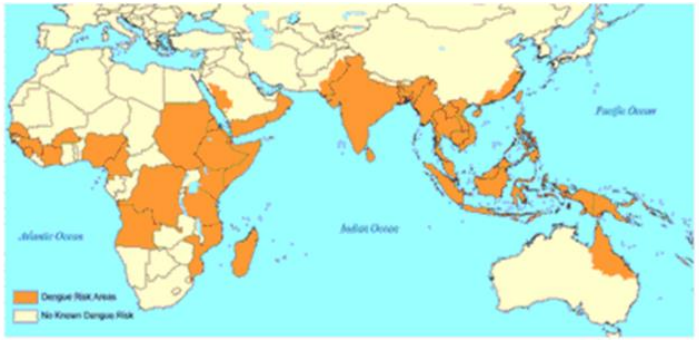
Chikungunya in US 2019 N=69



https://www.cdc.gov/chikungunya/geo/united-states-2019.html

Dengue Fever virus

- Transmitted by *Aedes sp.* mosquito
- Suburban and urban areas
- Daytime biters
- 4 different strains (1-4)
  - No long-term cross protection
  - Each subsequent infection is more severe



Dengue Epidemiology

- Short incubation period (4 days)
- Symptoms last ~7 days
- Milder disease 1st exposure/child
- Over 100 million cases per year
  - ½ are hemorrhagic fever
  - 22,000 deaths; mostly children

- High fever + 2 more:
  - Severe headache
  - Severe eye pain
  - Joint pain
  - Muscle/bone pain
  - Rash
  - Mild bleeding/bruising
  - Low WBC count

Case 4

Matt is a 21-year-old college junior who will be spending a semester in Southeast Asia as part of his international business bachelor's degree program. He also plans to travel around to some remote sites and camp during school breaks.

He asks if there are any specific vaccines he should have before traveling in Asia for several months?

Japanese Encephalitis Virus

- *Culex* mosquito; humans incidental hosts
- Nighttime biters; rural farming communities
- Most common vaccine preventable cause of encephalitis in Asia
- 1% develop symptoms:
  - Fever, headache, vomiting
  - Encephalopathy, weakness & movement disorders
- Up to 30% mortality rate
- Up to 50% long term neurologic sequelae

JE Virus Vaccine

- Risk is low ~1:1million for short stays
- Travel ≥1 month to endemic area in season
- 2 shot series; 2 mo to <18 yrs (28 days); ≥18-65 yrs (7 days)
  - Completed at least 1 week before travel
- Typical mild vaccine reactions
- Booster dose at 12 months if ongoing exposure

Cholera

Electron micrograph of *V. cholerae* courtesy of CDC

- Southeast Asia has the highest at-risk population
  - Poverty, crowding, widespread flooding
- Acute diarrheal illness, often mild or no symptoms
  - 10-15% develop severe disease leading to extreme dehydration
  - Renal failure & shock; death can be rapid
- Treatment leads to rapid recovery without long term effects
  - Rehydration most important; antibiotics adjunctive; zinc supplement 10-20 mg/day

Cholera Vaccine

- Single dose live oral vaccine approved 18-64 years
- Travel to area with transmission in past year or known to be endemic
- Reduces chance of severe diarrhea by 80% at 3 months after vaccine
  - Unknown protection beyond 6 months
- No antibiotics in previous 14 days

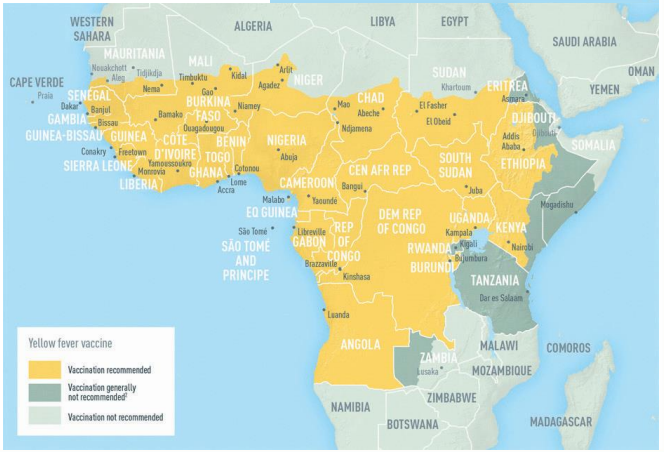
Case 5

The Jones family is traveling to Western Africa for mission work. They will stay for a year to help establish a primary and secondary school in Mali. They have 5-year-old twin girls. This is the first international trip for this family.

They ask what specific diseases they might need to worry about in that part of Africa?

Yellow Fever Virus

- Transmitted by *Aedes sp.* Mosquito
  - Same as Dengue and Chikungunya
  - Daytime biting mosquitoes
- Main reservoirs
  - Nonhuman primates and humans
- Occurs in two basic regions



Risk to Travelers

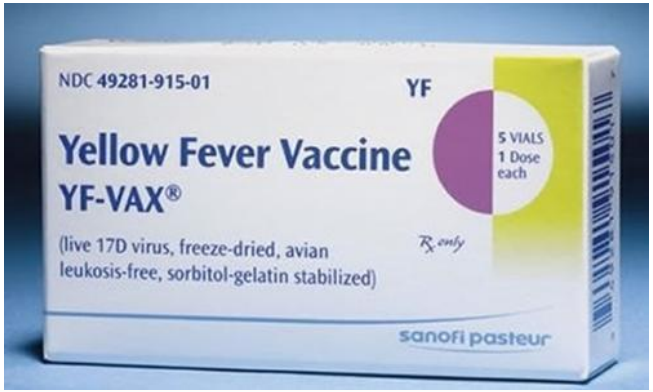
- Rural & urban transmission
- Season of travel
  - West Africa = July to October
  - South America = January to May
- Duration of exposure
- Activities while there

Yellow Fever Disease

- Short incubation (3-6 days)
- Initial symptoms:
  - fever, chills, head/backache, myalgia, prostration, N/V
- 15% progress:
  - Liver failure, hemorrhage, shock, organ failure
  - 20-50% mortality with renal/liver disease
- Brazil outbreak 2017-18

Yellow Fever Vaccine

- Live-attenuated viral vaccine
- Nearly 100% effective
- Recommended ≥ 9 months in at risk areas



Contraindications:

- Allergy to vaccine or eggs
- Age < 6 months
- Immune compromised

Precautions:

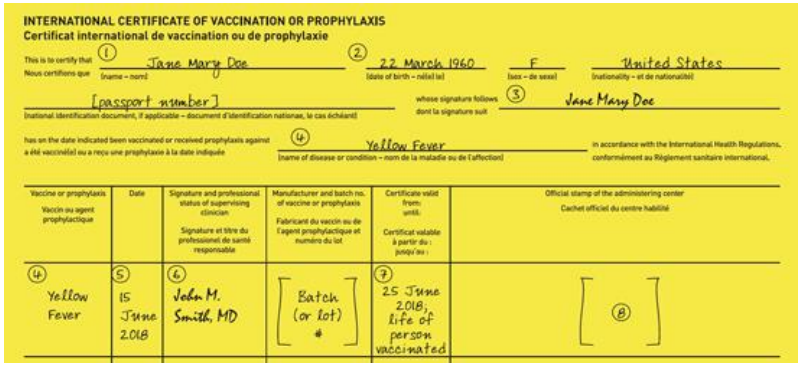
- Age 6–8 months
- Age ≥ 60 years
- Asymptomatic HIV
- Pregnancy
- Breastfeeding

YF - Vaccine Safety

- 10-30% mild symptoms lasting 5-10 days
  - Low-grade fever, headache, myalgia, local reaction
- Hypersensitivity Reactions (anaphylaxis)
  - 1.3 per 100,000 doses
- Neurologic disease (meningoencephalitis)
  - 0.8 per 100,000 doses
- Visceral disease (multi-organ failure)
  - 0.3 per 100,000 doses

Certificate of Vaccination

- Entry requirement in some countries
  - Established to prevent the importation and/or transmission of Yellow Fever
- State Health Department designates YF clinics
  - “Yellow Card” & Stamp or waiver
  - Valid for life
  - Consider 10 yr booster in outbreak



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

This is to certify that / Nous certifions que (1) Jane Mary Doe (name – nom) (2) 22 March 1960 (date of birth – initial lieu) 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 / dont la signature suit (3) Jane Mary Doe

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

Meningococcus

- 6 major serogroups: A, B, C, X, W, Y
- Type A historically endemic
  - Currently C & W, with some X
- Periodic epidemics Dec-June (dry season)
  - 1,000: 100,000 during an epidemic
- Highest rate in school age (5-14 yrs)
- Required for entry during pilgrimages (e.g. Hajj)

Meningococcal Vaccine

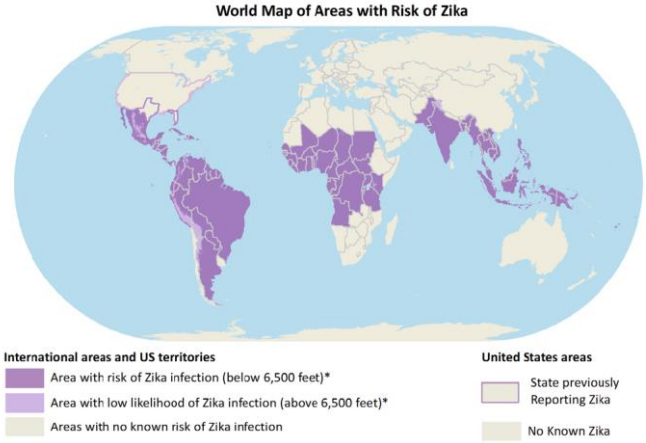
- 7-10 days needed to develop protective antibody
- Number of initial doses depends on age
  - 2 months = 4 dose series (MenACWY-CRM only)
  - 7-23 months = 2 dose series (MenACWY-CRM only)
  - 2-55 years = 1 dose before travel
- Repeat doses may be needed:
  - 1st dose at <7 years, booster at 3 years & every 5 years if ongoing risk
  - 1st dose at 7-55 years, booster every 5 years if ongoing risk

Case 6

Bridgette is a 15-month-old girl who is traveling with her family to Mexico for a family wedding. They plan to stay for 2 weeks. Bridgette is still nursing before naps and bedtime. This is their first trip since her birth.

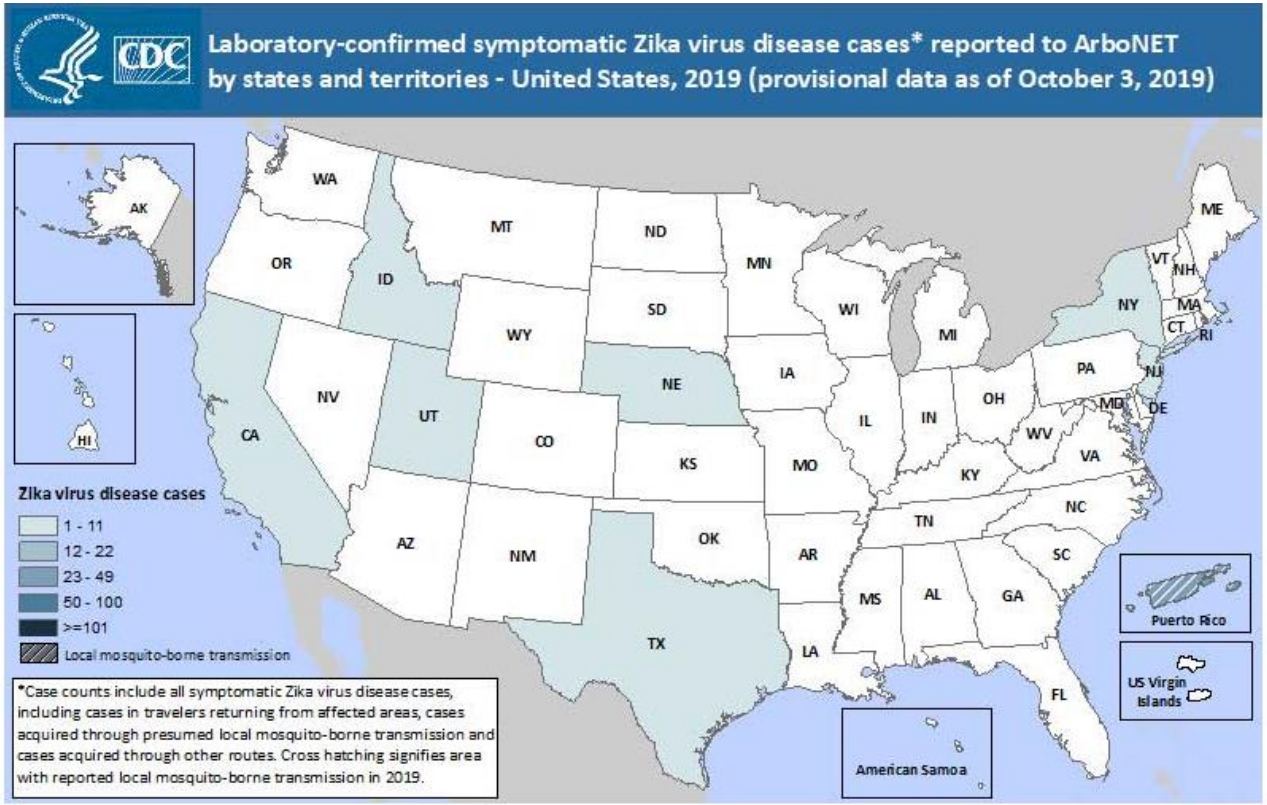
What advice should you give the family about the risk of Zika virus and breastfeeding during travel?

Zika



- Transmission *Aedes sp.* mosquito
  - In utero & sexual contact,
  - Intrapartum rare; NOT from breastfeeding
- No local transmission in US 2018 or 2019
- 1:5 will develop symptoms
  - Fever, maculopapular rash, arthralgia, conjunctivitis lasting a few days to 1 week

Cases by State and Territory



Zika: Pregnancy Considerations

- Postpone travel in pregnancy/planning pregnancy
  - Abstain from sex or use condoms throughout pregnancy
  - Men: wait to conceive for 3 months after symptom onset or return from Zika area
  - Women: wait at least 2 months after exposure or symptom onset to attempt conception
  - Incidence in pregnant women is not known; disease is similar to non-pregnant women

Polen KD, et al. MMWR. 2018.67:868-871.

Case 7

Henry and Catherine (3 years & 6 mos) are relocating with their parents to Argentina for the next 2 years for dad's work with a global conservation company.

Which vaccines should be considered before they travel?

General Vaccine Recommendations

- Ensure current for all routine vaccines
- Provide vaccines at the shortest interval possible
  - Use the accelerated schedule for extended stay travelers or if vaccine delayed
- Live virus vaccines given same day or 28 days apart
  - MMR, Varicella, Yellow Fever (30 days), LAIV
  - This does not effect oral typhoid or rotavirus

CDC Yellow Book 2017

Specific Recommendations

- Hepatitis A
  - Vaccine ≥ 6 months (New ACIP rec 11/2018)
- Measles ≥ 6 months (does not count)
  - Give 2nd dose if >28 days since first dose at 12-15 months
- Tetanus
  - Tdap for adolescents/adults
- Polio
  - One dose prior to travel to: Afghanistan, Angola, Benin, Burma, Central African Republic, DRC, Ethiopia, Ghana, Indonesia, Mozambique, Niger, Nigeria, Pakistan, Papua New Guinea, Somalia

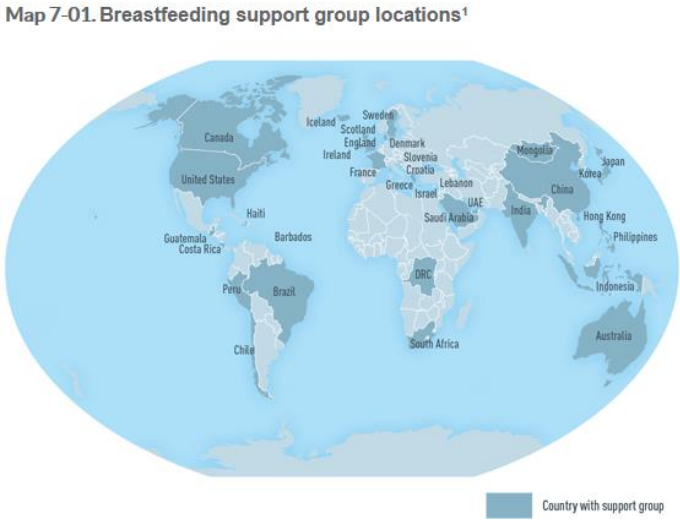
https://wwwnc.cdc.gov/travel/news-announcements/polio-guidance-new-requirements?deliveryName=DM11610

Breast Feeding

- Maintain regular schedule while traveling
- Careful food and beverage precautions; avoid bismuth
- Drink lots of fluids; avoid alcohol and caffeine
- NOT a contraindication for vaccines
  - Precaution for YF
- Chloroquine and mefloquine are safe
- Malarone is considered safe ≥5 kg infant

CMAJ 2011;183:E243
MMWR 2010;59:130-132

Breast Feeding



- Not affected by X-rays
- Exempted from TSA regs in US
- International Support groups
- International lactation consultant association
  - www.ilca.org/why-ibclc/falc
- NIH:
  - http://toxnet.nlm.nih.gov/newtoxnet/lactmed.htm

Take Home Points

Pre-travel counseling is complex with focus on:

- Insurance, passports, etc.
- Food and beverage precautions
- Mosquito avoidance & malaria prophylaxis
- Age-based safety/risk assessment
- Other diseases which could be encountered (e.g. TB)

Most Important is to have fun on their adventure!!