

# **VCU** Medical Center

## Illness in the Returning Traveler

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Travel & Tropical Medicine Clinic

# Overview

- Discuss the scope of the problem
- Discuss the conceptual approach to the febrile returning traveler
- Discuss initial work-up and management
- Identify key resources

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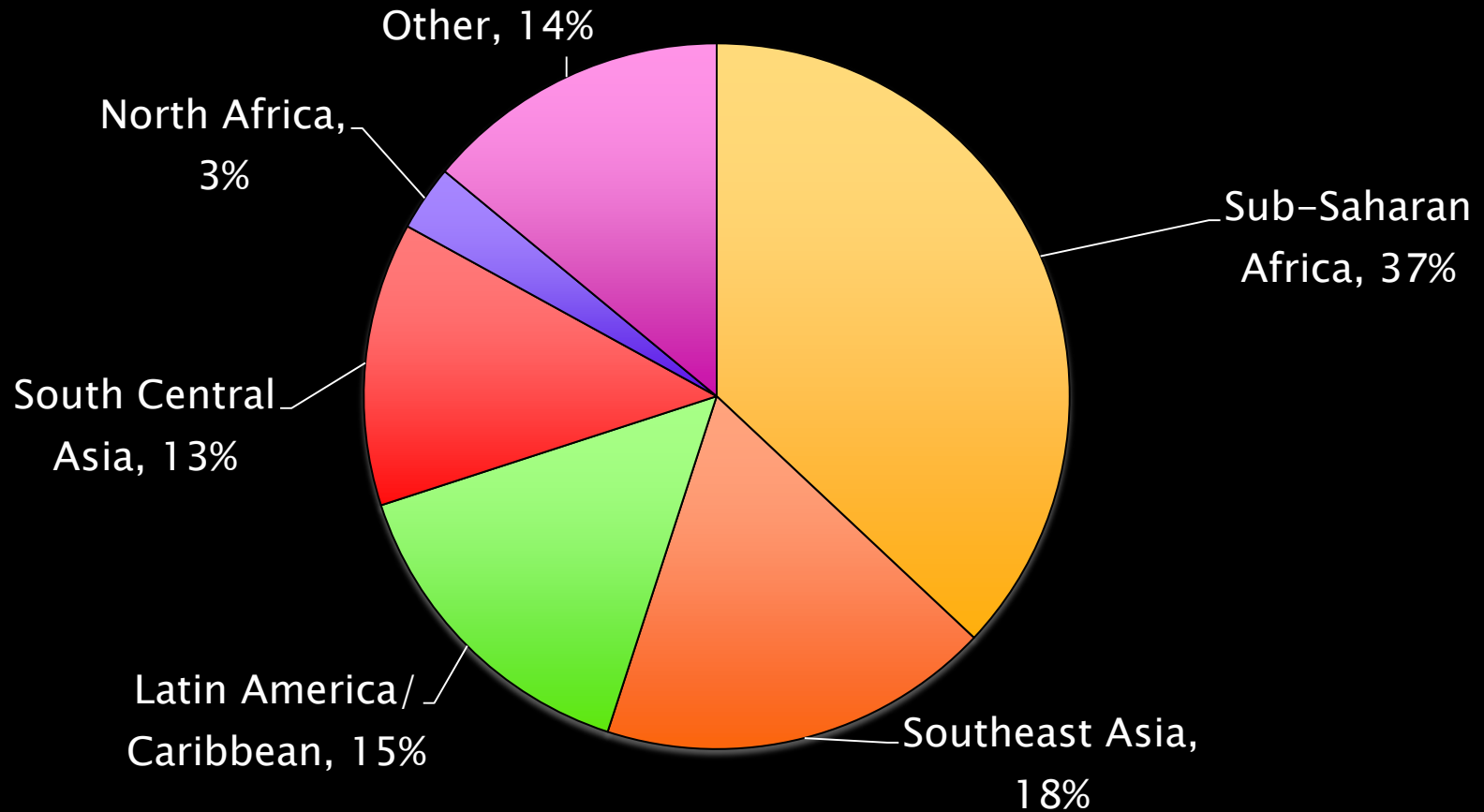
# The Scope of the Problem

- 15–70% of US travelers develop illness on international trips
  - Most illnesses are mild
  - Gastrointestinal complaints are most common (diarrhea)
- 1–5% of US travelers are sick enough to seek medical care upon returning to the US
- Infections acquired abroad can manifest late (months to years after return)

# Illness in Returning Travelers

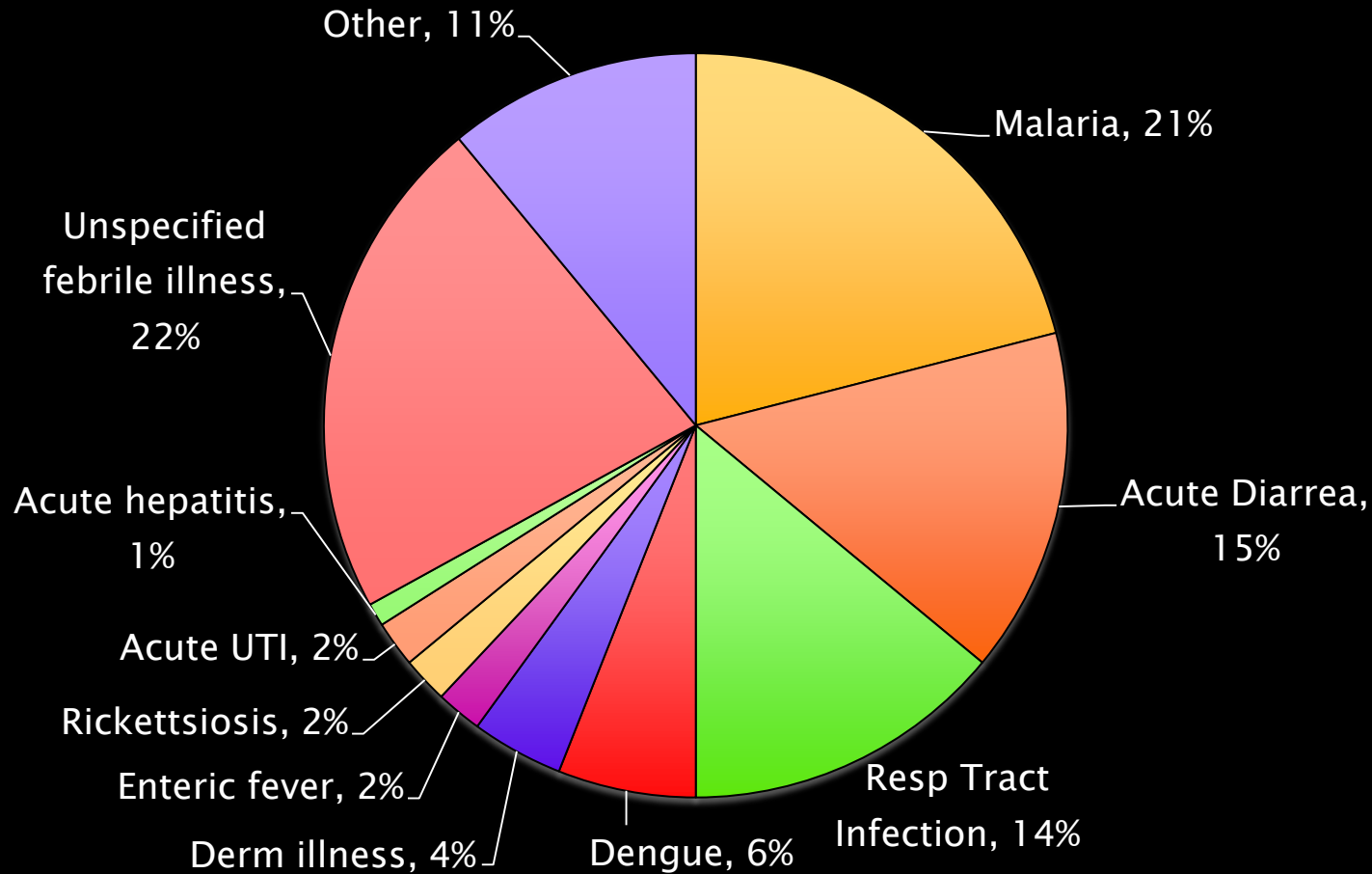
- Analysis by Wilson et al of GeoSentinel Surveillance Network data
  - 24,920 ill returned travelers
  - 6,957 had fever (28%)

# Region Visited



Wilson et al. Clin Infect Dis 2007;44:1560-8.

# Most Common Conditions



Wilson et al. Clin Infect Dis 2007;44:1560-8.

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# Creating Your Differential: 6 Key Considerations

1. **Geography: What is present?**
2. Incubation periods: What is likely?
3. Activities/ Exposures: Higher risk?
4. What is associated with high morbidity or mortality?
5. What is treatable?
6. What is transmissible?

# Febrile Illness: Incubation < 14 days

Disease	Geographic Distribution
Malaria ( <i>P. falciparum</i> , <i>P. vivax</i> )	Tropics, subtropics
Dengue	Tropics, subtropics
Chikungunya	Tropics, subtropics
Leptospirosis	Widespread; most common in tropics
Spotted fever rickettsiae	Widespread
Enteric fever	Widespread; especially India subcontinent
Influenza	Widespread
Acute HIV	Widespread
Legionellosis	Widespread
Encephalitis (arboviral)	Widespread; specific virus depends on region

CDC Yellow Book 2014; Keystone et al. Travel Medicine 2013.

# Febrile Illness: Incubation 14 days–6 weeks

Disease	Geographic Distribution
Malaria	Tropics, subtropics
Enteric fever	Widespread; especially Indian subcontinent
Leptospirosis	Widespread; most common in the tropics
Hepatitis A	Developing world
Hepatitis E	Widespread
Acute schistosomiasis (Katayama syndrome)	Most common with travel to Sub-Saharan Africa
Amebic liver abscess	Developing world

# Febrile Illness: Incubation > 6 weeks

Disease	Geographic Distribution
Malaria	Tropics, subtropics
Hepatitis B, E	Widespread
Amebic liver abscess	Developing world
Tuberculosis	Widespread
Leishmaniasis (visceral)	Africa, Asia, South America

# Creating Your Differential: 6 Key Considerations

~~1. Geography: What is present?~~

**2. Incubation periods: What is likely?**

- Most life-threatening diseases occur within the first 3 months after return
- Exceptions: Malaria, amebic liver abscess, visceral leishmaniasis

# Febrile Illness: Incubation < 14 days

Syndrome	Differential
Nonspecific febrile illness	Malaria, dengue, typhoid, rickettsial disease, East African trypanosomiasis, acute HIV, leptospirosis
Fever with CNS involvement	Meningococcal meningitis, malaria, arboviral encephalitis, rabies
Fever with respiratory complaints	Influenza, bacterial pneumonia, acute histoplasmosis or coccidiomycosis, Legionella, pneumonia, malaria, tularemia, plague
Fever and skin rash	Dengue, measles, varicella, rickettsial disease, typhoid, parvovirus B19, mononucleosis, acute HIV

# Febrile Illness: Incubation 14 days to 6 weeks

Syndrome	Differential
Nonspecific febrile illness	Malaria, enteric fever, leptospirosis
Fever with hepatitis	Hepatitis A, E
Other	Acute schistosomiasis (Katayama syndrome), amebic liver abscess

# Febrile Illness: Incubation > 6 weeks

Syndrome	Differential
Nonspecific febrile illness	Malaria, leishmaniasis (visceral) [2–10 months; 10 days–years]
Fever with hepatitis	Hepatitis E, B
Fever with respiratory complaints	Tuberculosis (primary: weeks; reactivation: years)



# Creating Your Differential: 6 Key Considerations

- ~~1. Geography: What is present?~~
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- 3. Activities / Exposures: Higher risk?**
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# Key Questions

- Travel itinerary
- Duration of travel
- Type of accommodation
- Pre-travel immunization history
- Adherence to malaria chemoprophylaxis
- Use of bed nets and insect repellants

# Key Questions

- Risk activities and exposures:
  - Source of drinking water
  - Consumption of raw meat, seafood, unpasteurized dairy products
  - Insect and arthropod bites
  - Activities in fresh water (swimming, rafting, wading, et cetera)
  - Adventure travel
  - Animal bites and scratches
  - Sexual contacts, tattoos, body piercing, shared razors
  - Hospitalizations and other medical care (Injections? Transfusions? Surgery?)

Risk	Diseases
Unsafe drinking water	Bacterial, viral and parasitic GI infections
Raw meat, sea food or unpasteurized milk products	Helminth infections; brucellosis, listeriosis
Insect and arthropod bites	Malaria, dengue, chikungunya, viral hemorrhagic fevers, rickettsial diseases
Activities in freshwater	Schistosomiasis, leptospirosis
Adventure travel	Spelunking (histoplasmosis)
Animal bites and scratches	Rabies, herpes B virus
Sexual contact, tattoos, piercings	Acute HIV, hepatitis B, hepatitis C
Hospitalization and local medical care	HIV, hepatitis B, hepatitis C

Franco-Paredes C et al. CDC Yellow Book 2013.

# Creating Your Differential: 6 Key Considerations

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# Case

- HPI: 42 yo male with h/o GERD and ADD who traveled to a coastal resort in the Dominican Republic 6/10–6/17 who developed the acute onset of fever, chills, malaise headache, myalgias, nausea and vomiting around 6/27
- Presents to a local clinic around 6/28, diagnosed with “viral illness” and sent home
- Re-presents to the ER on 7/1

# 42 yo Male with Recent Travel to the Dominican Republic

- Exam:
  - Febrile to 102
  - Scleral icterus present
  - Abd: normal sounds, diffusely TTP; + splenomegaly
  - No lymphadenopathy
  - No rash

# 42 yo Male with Recent Travel to the Dominican Republic

- Labs:
  - BUN/Cr: 32/1.13
  - AST: **170**, ALT: **348**
  - AP: 79; Bili, tot: **3.2**; Bili, conj: **1.6**
  - WBC: 5.5 with 72%N, 23%L, 1%E
  - HgB: **10.8** with MCV: 84.5
  - PLT: **33**



42 yo male with recent travel to the DR with acute non-differentiated febrile syndrome with anemia/hemolysis, hepatitis and thrombocytopenia

1. Geography: What is present?

42 yo male with recent travel to the DR with acute non-differentiated febrile syndrome with anemia/hemolysis, hepatitis and thrombocytopenia

## 1. Geography: What is present?

The screenshot displays the CDC website's 'Travelers' Health' section for the Dominican Republic. At the top, the CDC logo and 'Centers for Disease Control and Prevention' are visible, along with the tagline 'CDC 24/7: Saving Lives. Protecting People.™'. A navigation bar includes an 'A-Z Index' and a search box. The main heading reads 'TRAVELERS' HEALTH' with the slogan 'TRAVEL SAFE. TRAVEL SMART.' and an airplane icon. A left sidebar menu lists various resources, with 'Dominican Republic' selected. The main content area features a breadcrumb trail 'Home > Destinations (239)', social media sharing options (Recommend, Tweet, Share), and the title 'Health Information for Travelers to Dominican Republic Clinician View'. A map of the Dominican Republic is shown, highlighting major cities: San Francisco de Macoris, Santiago, La Romana, and Santo Domingo. To the right, an 'On This Page' section lists links for 'Vaccines and Medicines', 'Non-Vaccine-Preventable Diseases', 'Patient Counseling', 'Healthy Travel Packing List', 'Travel Health Notices', and 'Advising Returning Travelers'. A 'Switch to Traveler View' button is located at the bottom right of the page.

42 yo male with recent travel to the DR with acute non-differentiated febrile syndrome with anemia/hemolysis, hepatitis and thrombocytopenia

## 1. Geography: What is present?

- Malaria
- Dengue
- Hepatitis A, B
- Typhoid

The screenshot shows the CDC Home page for Travelers' Health, specifically the page for the Dominican Republic. The page title is "Health Information for Travelers to Dominican Republic" and it is in "Clinician View". The page includes a navigation menu on the left with options like "Destinations (239)", "Dominican Republic", "Travel Notices", "Find a Clinic", "Disease Directory", "Information Centers", "For Travelers", "For Clinicians", "Travel Industry", "Yellow Book", and "RSS Feeds". The main content area features a map of the Dominican Republic with major cities labeled: San Francisco de Macoris, Santiago, La Romana, and Santo Domingo. The map also shows neighboring countries (Turks and Caicos Islands, Haiti, Puerto Rico) and bodies of water (Atlantic Ocean, Caribbean Sea). Social media sharing options for Facebook, Twitter, and a general share button are visible. A "Switch to Traveler View" button is located at the bottom right. The page also includes a "Recommend" button with a count of 5, and a "Share" button.

42 yo male with recent travel to the DR with acute non-differentiated febrile syndrome with anemia/hemolysis, hepatitis and thrombocytopenia

1. Geography: What is present?
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3. **Activities / Exposures: Higher risk?**

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# Undifferentiated Fever

- **Malaria**
- Dengue
- Chikungunya
- Rickettsial illness
- Enteric fever
- Leptospirosis
- Acute schistosomiasis
- Amebic liver abscess

Wilson ME et al. In: Travel Medicine 2013.

# Malaria

- Risk is highest with travel to Sub-Saharan Africa
- 60% initially report fever (40% may not)
- Fever and headache are common; GI and pulmonary symptoms can confuse the diagnosis

# Malaria

- Absence of leukocytosis and thrombocytopenia are common
- Malaria blood smears should be performed urgently
  - Repeat 8–24 hours later if initial testing is negative

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# Initial Work–Up: Febrile Patient with Recent Travel to the Tropics

- CBC with differential
- Hepatic panel, BMP
- Blood cultures (x2 sets)
- Blood smears for malaria or rapid diagnostic testing for malaria
- Urinalysis and urine culture
- CXR

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# Helpful Resources

- Resources to help identify providers versed in travel and tropical medicine:
  - American Society of Tropical Medicine & Hygiene: [www.astmh.org](http://www.astmh.org)
  - International Society of Travel Medicine: [www.istm.org](http://www.istm.org)



# Helpful Resources

- CDC:
  - Malaria questions (business hours): 770-488-7788
  - Malaria questions (after hours): 770-488-7100
  - Parasitic infections (business hours): 770-488-7775

# Decision Support

- Online algorithm to help with the differential diagnosis and work up of the febrile returning traveler
  - [www.fevertravel.ch](http://www.fevertravel.ch)

# CDC's "Yellow Book"

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

Travelers' Health  
All CDC Topics  
Choose a topic above **SEARCH**




A-Z Index **A B C D E F G H I J K L M N O P Q R S T U V W X Y Z #**

## TRAVELERS' HEALTH

TRAVEL SAFE. TRAVEL SMART. 

- Home
- Destinations
- Travel Notices
- Find a Clinic
- Disease Directory
- Information Centers
  - For Travelers
  - For Clinicians
  - Travel Industry
- Yellow Book**
  - Contents
  - Tables
  - Maps
  - Figures
  - Boxes
  - Updates

[Home](#)

 Recommend 75  Tweet 37  Share

### Yellow Book Homepage

#### Explore Travel Health with the 2014 Yellow Book!

*CDC Health Information for International Travel* (commonly called the Yellow Book) is published every two years by CDC as a reference for those who advise international travelers about health risks. The Yellow Book is written primarily for health professionals, although others will find it useful.

#### Get Your Copy of the 2014 Edition


Order your copy of the 2014 edition from Oxford University Press:

- See [Oxford's website](#)
- Or call 1-800-451-7556 (toll-free USA) or 1-919-677-0977, Monday-Friday between 8:00 am and 6:00 pm (Eastern Time) and ask for ISBN#978-0-19-994849-9

You can also order a copy from major online booksellers, such as Amazon and Barnes & Noble.



**Contact Us:**

-  Centers for Disease Control and Prevention  
1600 Clifton Rd  
Atlanta, GA 30333
-  800-CDC-INFO  
(800-232-4636)  
TTY: (888) 232-6348  
[Contact CDC-INFO](#)

[Access the 2014 Yellow Book on your Mobile Device](#)

[wwwnc.cdc.gov/travel/page/yellowbook-home-2014](http://wwwnc.cdc.gov/travel/page/yellowbook-home-2014)

# Questions?



The screenshot shows the VCU Medical Center website. At the top left is the VCU logo. To its right is a search bar with the text "Enter Search Here..." and a link to "Advanced >". Below the logo and search bar is a navigation menu with links for "About Us", "Medical Services", "Online Services", "Patients & Visitors", "Education & Research", "Locations", and "Nursing". Below the menu is a secondary navigation bar with links for "home", "site map", "text size a+ a-", "share", and "print this".

The main content area features a large banner image of several doctors in white coats looking at a whiteboard. To the right of the image is the text "Travel & Tropical Medicine Clinic". Below the banner is a breadcrumb trail: "Home » Medical Services » All Services » Specialized Services » Travel & Tropical Medicine Clinic". Below the breadcrumb is the title "Travel & Tropical Medicine Clinic" and a photograph of a group of people in a rural setting, some wearing colorful traditional clothing.

On the left side of the page, there is a sidebar with a "BACK TO HOME" link and a link to "Travel & Tropical Medicine Clinic" with a sub-link for "Visit Background Form".

On the right side of the page, there is a yellow box titled "Related Information" containing a "News" section with the headline "Early Identification and Treatment of Septic Shock to Save Lives" and a "Physicians" section listing "Michael Stevens M.D., M.P.H." and "Veronica Ayala-Sims M.D." with a "View All (8)" link.

Below the photograph, there is a paragraph of text: "Appointments to the Travel & Tropical Medicine Clinic can be made by calling **804-828-4515**; appointments can be made for pre-trip evaluation and immunizations; appointments can also be made for returning travelers with infection-related issues (diarrhea, fever, et cetera)". Below this text is the "Physician Director" section, which lists "Michael P. Stevens, M.D., M.P.H." with a link to his profile.

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