



# Infectious Disease Challenges in Refugees and Immigrants

Presented by:

Elizabeth D. Barnett, M.D.

Wed. May 9, 2012 | 1:00-2:30pm EDT

**\*Please listen via computer speakers or headphones  
Chat to Chairperson for phone line  
Limited lines available\***

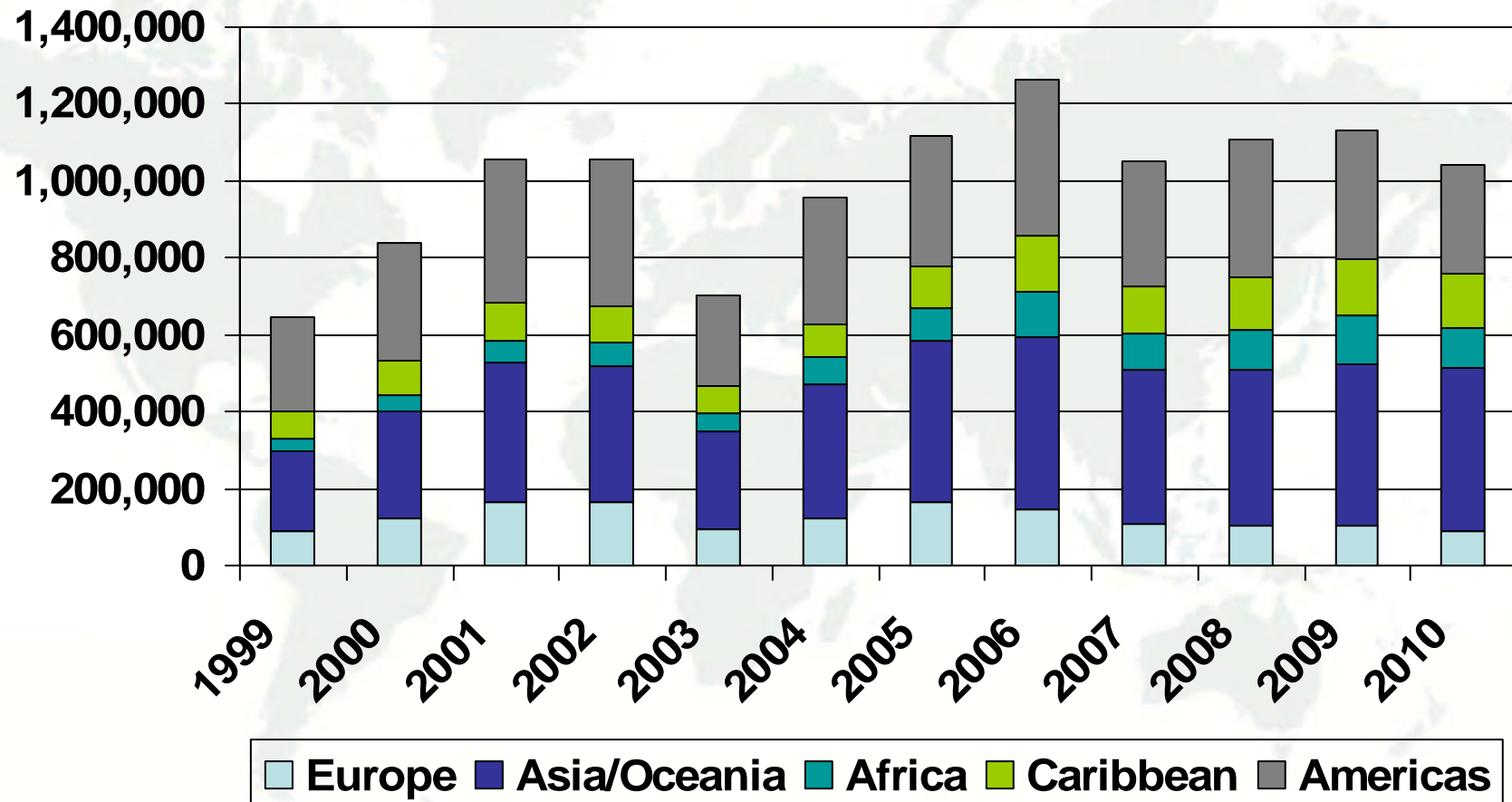
**REFUGEEHEALTH** TECHNICAL ASSISTANCE CENTER  1



# Webinar overview

- Presentation by Elizabeth Barnett(50 minutes)
- Q&A via Chat Window (20 minutes)
- Slides, webinar recording, Question and Answers, and additional resources will be posted to <http://refugeehealthta.org> after the webinar
- Email [refugeehealthta@jsi.com](mailto:refugeehealthta@jsi.com) if you have any questions after the webinar

# US Immigrant Arrivals 1999-2010

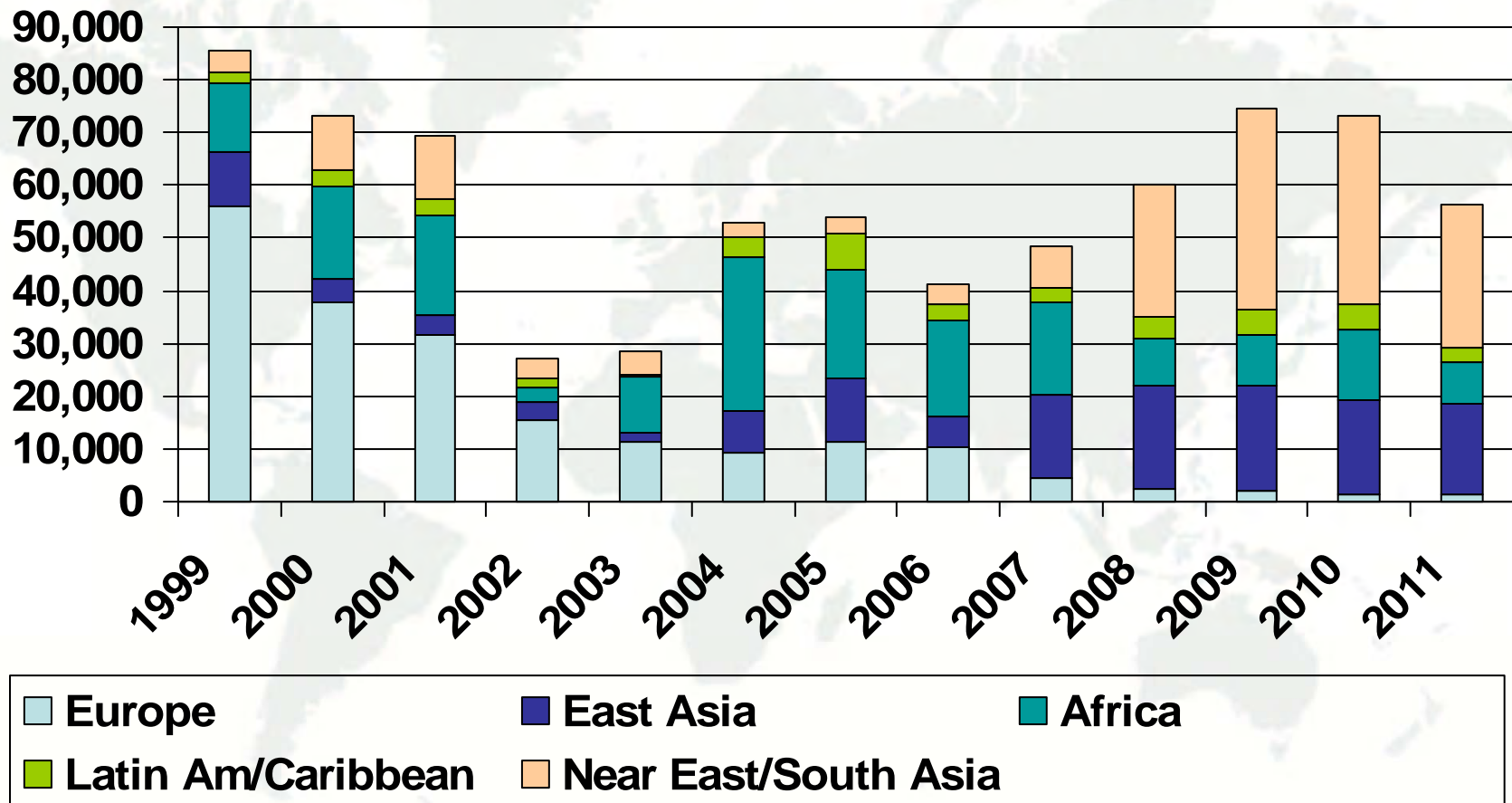


Source: Department of Homeland Security, Office of Immigration Statistics, Yearbook of Immigration Statistics.

<http://www.dhs.gov/files/statistics/publications/yearbook.shtm>

Accessed at MPI Data Hub [http://www.migrationinformation.org/datahub/countrydata/files/DH\\_US\\_InflowLPRsbyCOB.xls](http://www.migrationinformation.org/datahub/countrydata/files/DH_US_InflowLPRsbyCOB.xls)

# Refugee Admissions 1999-2011



Source: Department of State, Bureau of Population, Refugees and Migration  
 Worldwide Refugee Admissions Processing System [www.wrapsnet.org](http://www.wrapsnet.org)



# US Medical Screening Checklist

- **General medical examination**
  - History and physical examination
  - Nutrition and Growth
- **Preventive health interventions**
  - Immunizations
- **General testing (not disease specific)**
  - Recommended for all refugees
  - Recommended for specific groups of refugees
- **Mental health screening (encouraged, depending on available)**
- **Disease-specific testing**
  - Tuberculosis
  - Lead
  - Malaria
  - Intestinal Parasites (IP)
  - Sexually transmitted diseases
    - Syphilis
    - Chlamydia
    - Gonococcus
- **HIV**
- **All refugees should be screened for hepatitis B**



# Infectious Disease Challenges

- Identifying acute illnesses of importance to the patient and public health
- Diagnosing unfamiliar conditions with subtle or non-specific signs and symptoms
- Screening initially and across the lifespan for diseases of long latency associated with route of migration





# Infectious Disease Challenges

- Communicable infections (public health focus)
- Symptomatic infections (patient focus)
  - Dental caries
- Vaccine preventable infections (measles, varicella, influenza, etc)
- Eosinophilia and Parasitic Infections
- Infections of long latency
  - Hepatitis B
  - Latent tuberculosis infection (LTBI)
  - Human papillomavirus (HPV)
  - H pylori
  - EBV



# Objectives

- Discuss several cases relevant to the challenges we face in caring for refugees and immigrants
- Convince you of the value of taking a migration and travel history for every patient at every encounter





# Anemia in an African Refugee

- 22 month old toddler seen 2 weeks after arrival from a refugee camp in Guinea
- Mother concerned about fever, cough, and occasional abdominal pain
- On exam child appears pale, sad, and cries easily. T-100.2 (ax), runny nose, clear chest, 2-3/6 systolic ejection murmur, normal abdominal exam, neuro exam non-focal



# Differential Diagnosis for Newly Arrived Toddler with Fever

- Locally acquired infection: viral infection (influenza, etc), bacterial infection (what is the baby's immunization status?)
- Migration-associated infection: malaria, dengue, etc.
- Narrowing in on appropriate differential:
  - Timing related to migration
  - Incubation periods of possible infections
  - Epidemiology of possible infections (infections circulating locally, etc)



# Anemia in an African Refugee

- CBC and blood culture obtained
- Results of the CBC include:
  - Hgb 5.3, Hct 18.8, MCV 68
  - WBC 11,100 with 32 polys, 50 lymphs, 16 monos, 1 eos, 1 baso
  - Smear: marked anisocytosis; moderate polychromasia, hypochromia, and poikilocytosis; and target cells



# Anemia in an African Refugee

Specific diagnosis and therapy is most urgent for which possible cause of anemia in this toddler:

1. RSV bronchiolitis
2. Pulmonary tuberculosis
3. Malaria
4. Iron deficiency anemia
5. Sickle cell disease
6. G6PD deficiency



**POLL**

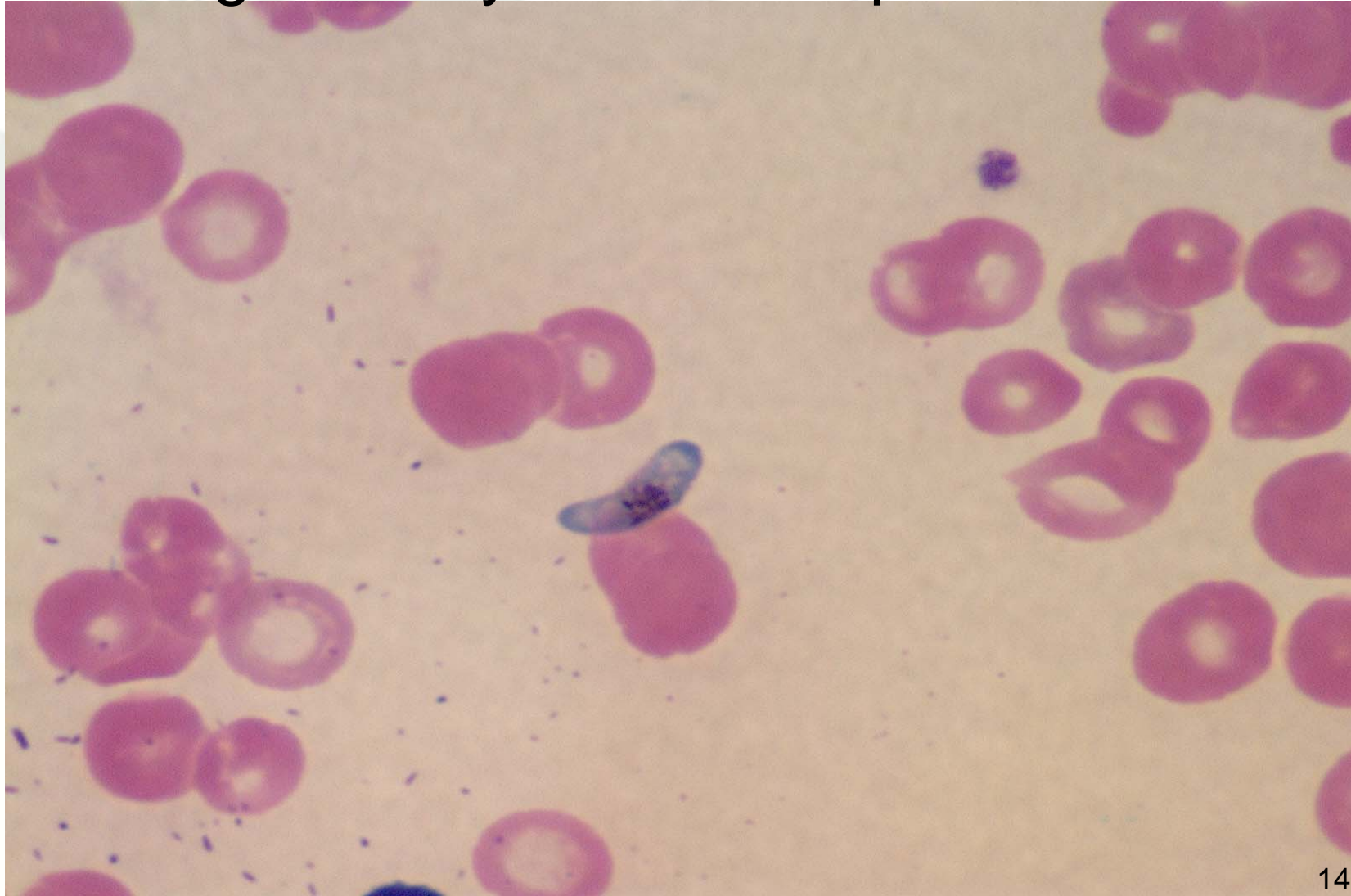


# Anemia in a Refugee

- Blood smear shows multiple ring forms plus banana-shaped gametocytes
- Hemoglobin electrophoresis: 96% HgbA, 1% HgbF, 3% HgbA2
- Pb 13, ZnPP 217 (nl 0-34)



Blood smear: Banana-shaped gametocyte of *P. falciparum*







# Anemia in a Refugee

- Treated with atovaquone-proguanil for 3 days in hospital
- G6PD normal; prescribed primaquine upon discharge; mother reports he took all the doses
- Reticulocyte count 12.3% 3 days later
- One month later Hct-26



# Should all African refugees be screened for malaria?

- Pre-departure therapy given to many refugees
- Screen those with compatible signs and symptoms: fever, severe anemia, unexplained thrombocytopenia, splenomegaly (may need additional testing to identify hyper-reactive malarial splenomegaly, an abnormal immune response to chronic or repeated malaria infection)
- Be aware that CDC recommendations suggest treating and/or screening all refugees from sub-Saharan Africa that were not treated pre-departure



# Multiple Medical Conditions

- Elevated lead level and iron deficiency anemia also present and need to be addressed
- Look for multiple conditions in refugees and immigrants
- Address lack of immunizations
- Consider diseases of long latency (LTBI, hepatitis B) once acute issues addressed



# Eosinophilia in a Recent Arrival from Haiti

- 8 year old boy seen to receive shots for school after arrival from Haiti
- CBC shows WBC 29,800 with 11% polys, 22% lymphs, 3% monos, 64% eos (absolute eosinophil count (AEC) 18,800)
- Asymptomatic; no skin lesions, itching, adenopathy, fevers, pulmonary symptoms, diarrhea, headaches, abdominal problems



# Evaluation of Eosinophilia in Refugees

- What is eosinophilia?
  - Absolute eosinophilia count (AEC)  $> 450/\text{mm}^3$
- Assume parasitic infections (but don't forget completely other causes of eosinophilia)
  - NAACP: neoplasm, allergy/asthma, Addison's disease, collagen vascular diseases, parasitic diseases
- Stool testing for ova and parasites is not sufficient
  - Assesses only luminal parasites
  - Must pursue other modes of diagnosis

*Seybolt LM, Christiansen D, Barnett ED. Diagnostic evaluation of newly arrived<sup>19</sup> asymptomatic refugees with eosinophilia. Clin Infect Dis 2005;42:363-7.*





# Evaluation of Refugees with Eosinophilia for Parasitic Diseases

- Consider epidemiology of the possible infections
  - Must know complete migration route
  - Must have access to up-to-date information about disease epidemiology
- Look for specific signs and symptoms
  - Skin findings (itching, nodules, rashes, etc)
  - Hematuria
  - Neurologic findings



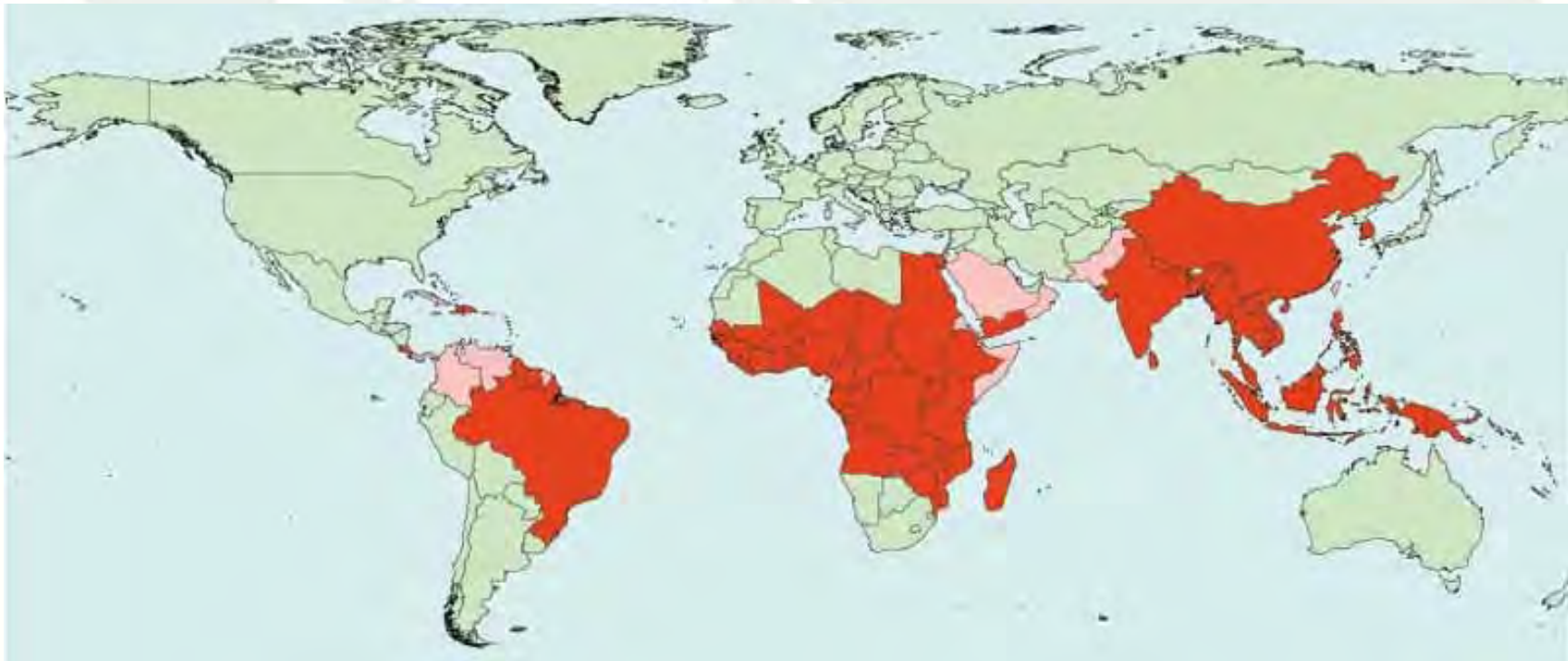


# Eosinophilia in a Recent Arrival from Haiti

- Stool for ova and parasites negative
- Eosinophilia persists; no atopic disease, evidence of neoplasm, drug ingestions
- Consider parasite serologic tests
  - Filaria (lymphatic filariasis is common in Haiti)
  - Strongyloides (present globally)
  - No schistosomiasis known in Haiti
  - Consider additional parasites if these unrevealing (toxocara, etc)

# Global Distribution of Filarial Infections

- Red = endemic, Pink = uncertain, Green = non-endemic



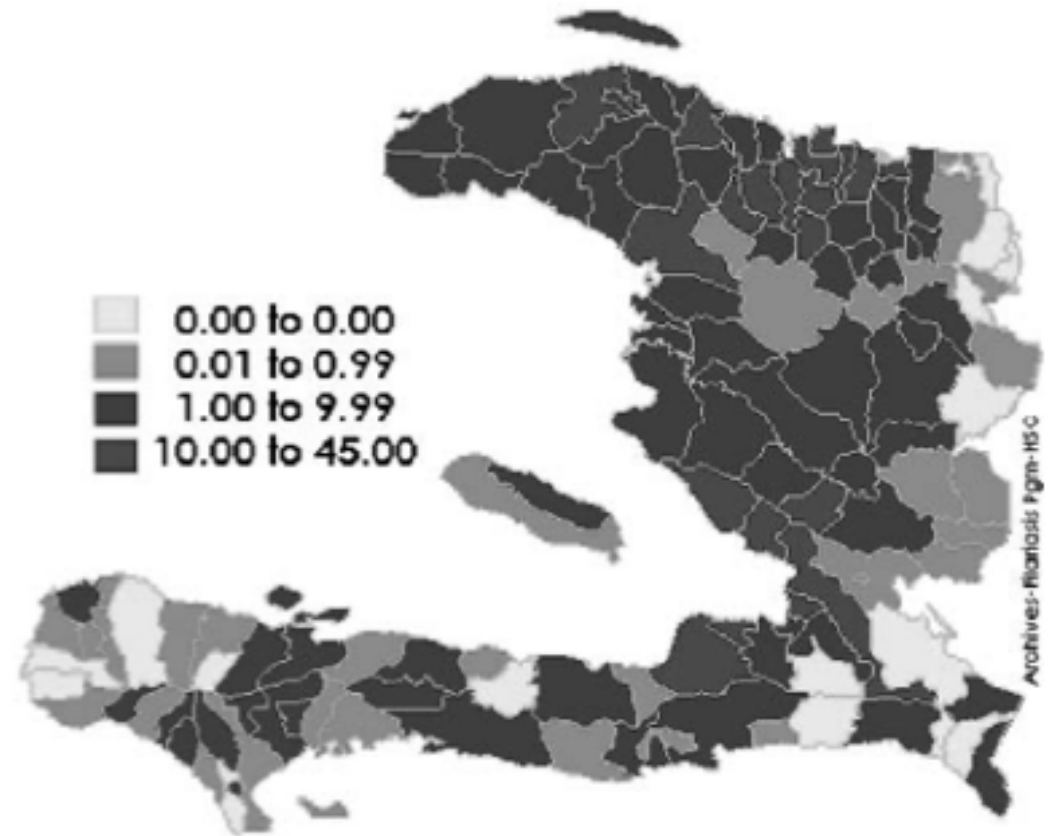


# Types of Filaria Infection

- Lymphatic filariasis (*Wuchereria bancrofti* (90%), *Brugia malayi* (Asia), *Brugia timori* (southeastern Indonesia only))
- Onchocerciasis (river blindness, caused by *Onchocerca volvulus*)
- Loiasis (*Loa loa*)
- *Mansonella perstans* (sub-Saharan Africa)

# Lymphatic Filariasis in Haiti

- 2001 prevalence in 6-11 year old children: 7.3%
- Program to Eliminate Lymphatic Filariasis on-going





Microfilaria of *Wuchereria bancrofti*





# Treatment of Lymphatic Filariasis

- Diethylcarbamazine (DEC) available from CDC
- If leg swelling is present, must counsel patient about foot and leg care
- Consider evaluation of family members





# Eosinophilia in a Liberian Refugee from Ghana

- 26 year old man seen for health assessment 6 weeks after arrival from Ghana
- Healthy except for toothache; treated for scabies and tinea capitis in Ghana
- WBC 10,400 with 28 polys, 1 band, 34 lymphs, 6 monos, 31 eos (AEC 3,200)
- Denies skin lesions, itching, adenopathy



# A refugee from Liberia

The most urgent medical issue to address in this young man is:

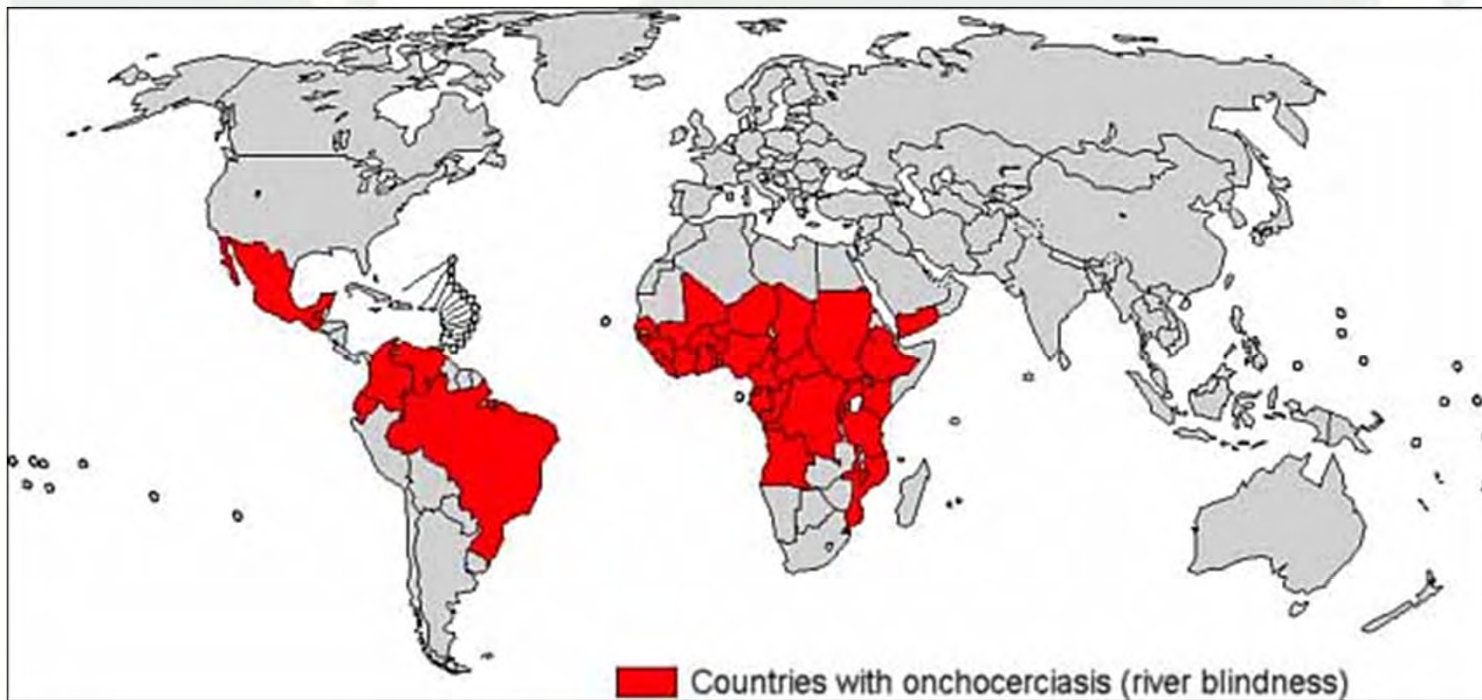
1. Eosinophilia
2. Screening for latent TB infection
3. Screening for hepatitis B infection
4. Toothache
5. Screening for HIV infection



**POLL**

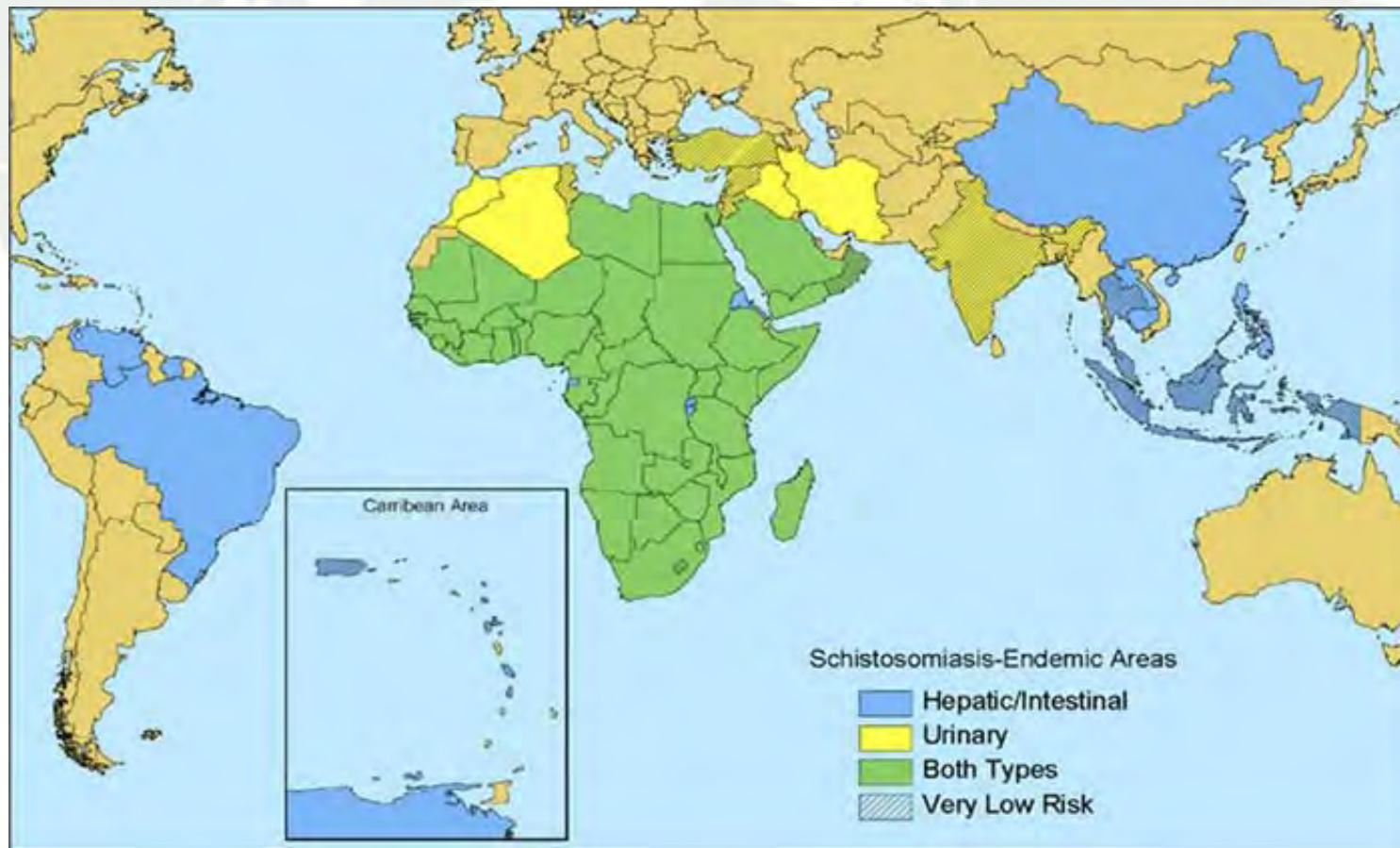
# What is different about this situation?

- Epidemiology
  - LF is present in West Africa, but so is onchocerciasis



# Eosinophilia in West Africa

- And so is schistosomiasis:







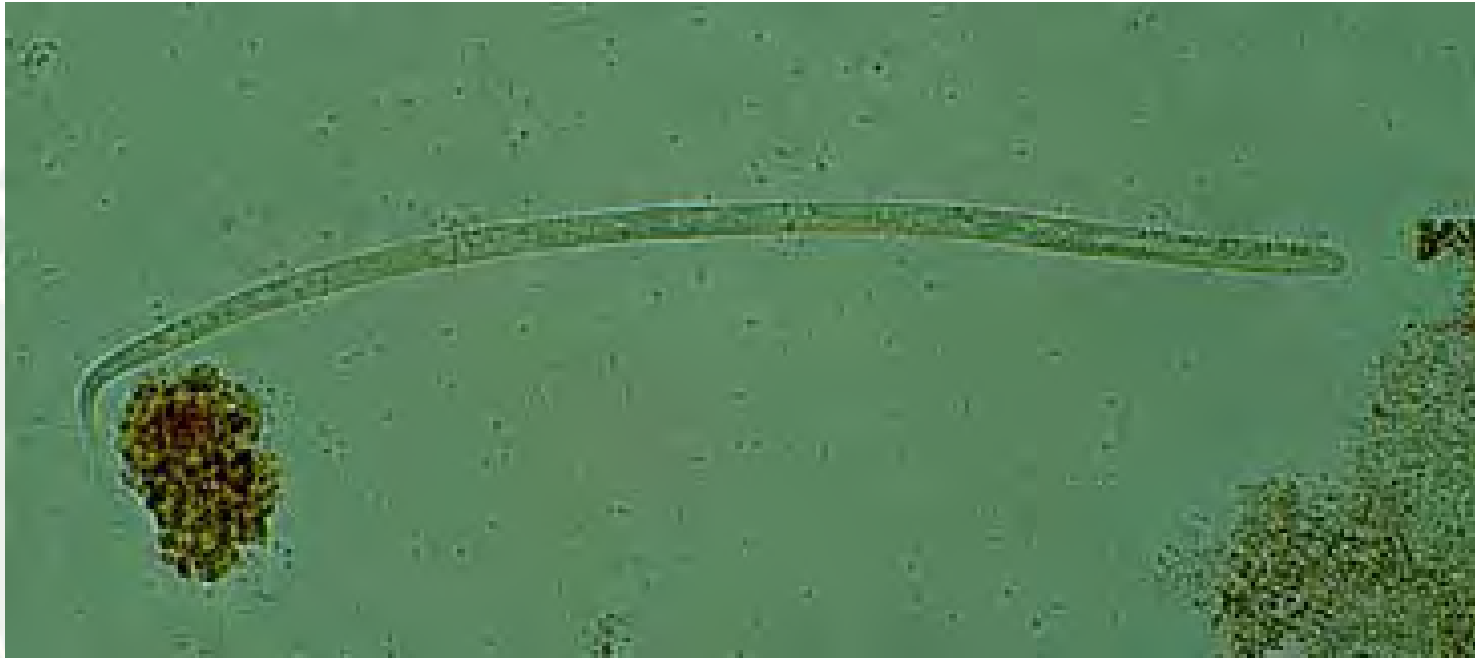
# Eosinophilia in a Liberian Refugee from Ghana

- Strongyloides antibody positive
- Schistosomiasis antibody negative
- Filaria antibody strongly positive
  - Circulating antigen negative
  - Onchocerca card test positive, eye exam ok
  - Treated with ivermectin (will treat both strongyloides and onchocerciasis)



# Onchocerciasis





Wet preparation of skin snip showing microfilaria of *Onchocerca volvulus*



# Evaluation and treatment of onchocerciasis

- Slit lamp exam (after sitting head down for about 20 minutes) can identify microfilariae in the anterior chamber
- Treatment with ivermectin may need to be titrated to itching- every several months for the first few years, then less frequently
- Alternative treatment: doxycycline treats symbiotic bacterium *Wolbachia*
- Be cautious about use of ivermectin when patient is from areas with *Loa loa* due to risk of encephalopathy

# Eosinophilia in West Africa

- Loiasis and onchocerciasis distribution:





# Hematuria in a Refugee from Somalia

- An 11-year-old boy from Somalia who lived in Kenya for the past 7 years presents with abdominal pain and history of hematuria
- CBC shows WBC 8,200 with 44 polys, 24 lymphs, 8 monos and 24 eos (AEC 2000);
- Trichiuris is identified in the stool
- PPD is 10 mm



# Hematuria in a Somali refugee

What is the test most likely to identify the cause of the hematuria in this child?

1. Urine calcium/creatinine ratio
2. Urine culture
3. ASO titre
4. BUN/Cr
5. Urine for ova and parasites



**POLL**





Schistosoma hematobium eggs in urine




# Urinary Schistosomiasis

- Schistosomiasis antibody positive
- Renal ultrasound revealed moderate left hydronephrosis with calyceal dilatation
- Treated with praziquantel and mebendazole
- 3 months later hydronephrosis resolved, but urine still positive for *S. hematobium* eggs
- Retreated with praziquantel



# Leg Pain and Swelling in a Recent Arrival from Haiti

- 17 year old female with several weeks of leg pain and intermittent swelling
- Came to Boston from Haiti in 2000
- Denies fever, headache, diarrhea; states she does have cough, sweats, fatigue
- CBC: WBC 4,800 with 44 polys, 37 lymphs, 8 monos, 10 eos; platelets 269,000



Which is the most likely cause of her leg symptoms?

1. Deep vein thrombosis
2. Methicillin resistant *Staphylococcus aureus* infection
3. Lymphatic filariasis
4. Complex regional pain syndrome



**POLL**



# Leg Pain and Swelling in a Recent Arrival

- PPD positive, CXR negative: INH
- Given a diagnosis of complex regional pain syndrome; given nerve block; minimal relief
- Are you content with this diagnosis?
- What would you do next?





# Diagnosis Does not Explain Eosinophilia

- AEC =  $480/\text{mm}^3$
- Filaria antibody positive, with positive circulating antigen and IgG4
- Treated with DEC; symptoms improved prior to starting medication
- Educated about foot care




# Summary Points from Eosinophil Cases

- Most refugees have multiple diagnoses: keep looking until ALL unexplained findings are explained
- Parasitic infections are common
- Even minor degrees of eosinophilia should be addressed



# Seizures in a Refugee from Burma

- A 9-year-old boy who arrived recently from Burma has a first seizure
- No fever, neck stiffness; lumbar puncture is normal without sign of infection
- CBC has no eosinophilia; stool for ova and parasites is negative



The next most appropriate step in making a diagnosis would be:

1. Toxoplasmosis serology
2. Head CT scan or MRI
3. HIV serology
4. Japanese encephalitis serology
5. Tuberculin skin test



**POLL**







# Neurocysticercosis

- Caused by the larvae of *Taenia solium*; may occur after exposure to *Taenia solium* eggs which are present in human feces (thus ingestion of pork is not required)
- Serologic test is available; sensitivity is higher with multiple CNS lesions
- Treatment options include anticonvulsants (mainstay of therapy) and antiparasitic drugs

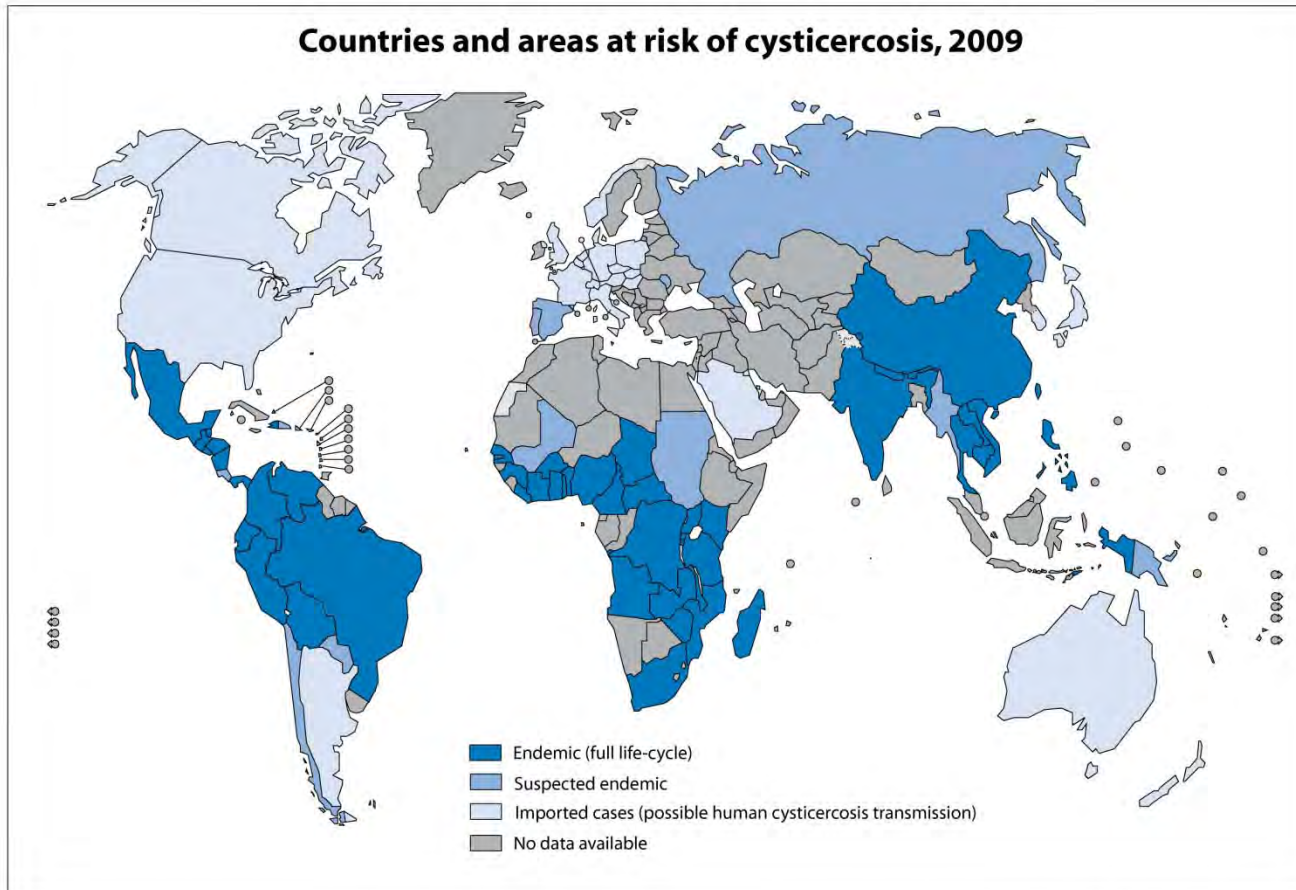


# Management of Neurocysticercosis

- Assessment of status of lesions is helpful; if inactive (calcified) seizure management is the first (and perhaps only) step
- Treatment of parasite is controversial (albendazole/(praziquantel) +/- steroids)
- Recent discussion of pre-departure treatment with albendazole and seizures in individuals with neurocysticercosis\*

\*O'Neal SE, Robbins NM, Townes JM. Neurocysticercosis among resettled refugees from Burma. *J Travel Med* 2012;119:118-121.

# Cysticercosis, 2009 (WHO)



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement. © WHO 2010. All rights reserved

Data Source: World Health Organization  
Map Production: Control of Neglected  
Tropical Diseases (NTD)  
World Health Organization





# Migrants as Sentinels for Infectious Diseases

- Burma not thought to be high risk area for neurocysticercosis
- Consider known epidemiology but be prepared for surprises
- *T. solium* seroprevalence in refugees (ELISA)\*
  - Burma (23.2%)
  - Laos (18.3%)
  - Bhutan (22.8%)
  - Burundi (25.8%)

\*O'Neal SE, Townes JM, Wilkins PP, et al. *EID* 2012;18:431-438.



# Diseases of Long Latency: Examples

- Strongyloides (hyperinfection syndrome)
- HPV (cervical and other cancers)
- Chagas disease (heart and GI diseases)
- Lymphatic filariasis
- Exposures to environmental toxins
- Exposures to malnutrition and micronutrient deficiencies
- Many others...



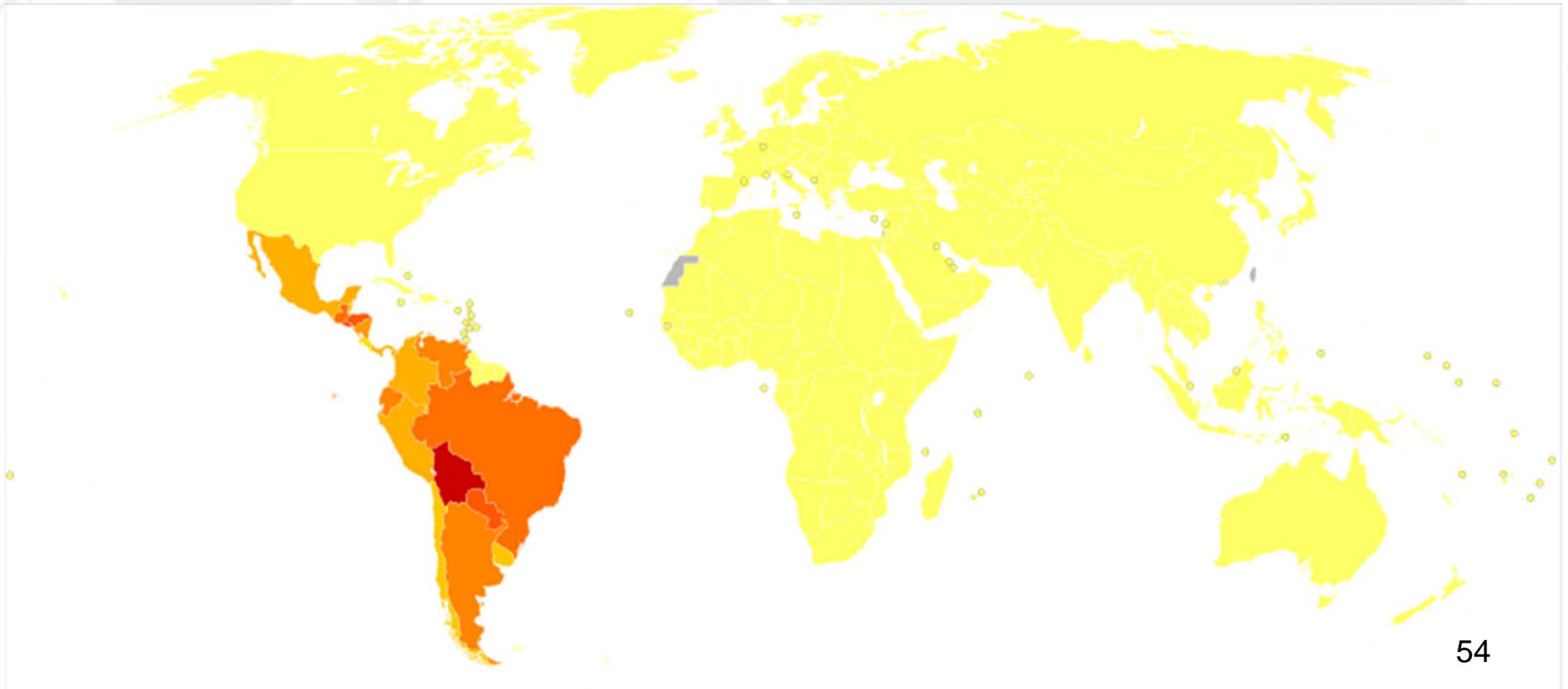


# A Recent Arrival from Bolivia

- You see a 42 year old woman who just received asylum; born and raised in Bolivia
- She presents with dyspnea on exertion, poor exercise tolerance, and some vague GI complaints
- Cardiac evaluation reveals heart failure

# Heart Disease in Young Recent Arrivals

- Rheumatic heart disease
- Chagas disease
  - Global distribution:



# Chagas Disease in the US


- Leading cause of mortality and cardiac disease among young adults in Latin America
- About 50,000-120,000 individuals living in the US are infected with Chagas disease
- US Blood supply screened since 2006





# Consequences of Infection with Chagas Disease

- 20-30% will develop chronic disease years after infection
  - Progressive cardiomyopathy
  - Motility disorders of esophagus and colon
  - Reactivation in those who become immunocompromised
- Can be transmitted vertically



# Management of Chagas Disease

- Confirm the diagnosis (high quality testing done at CDC)
- Treatment is recommended for all infected children and those with acute, congenital, or reactivated disease
- Two drugs are effective, neither available in the US except through CDC: benznidazole and nifurtimox
- Long-term follow-up needed



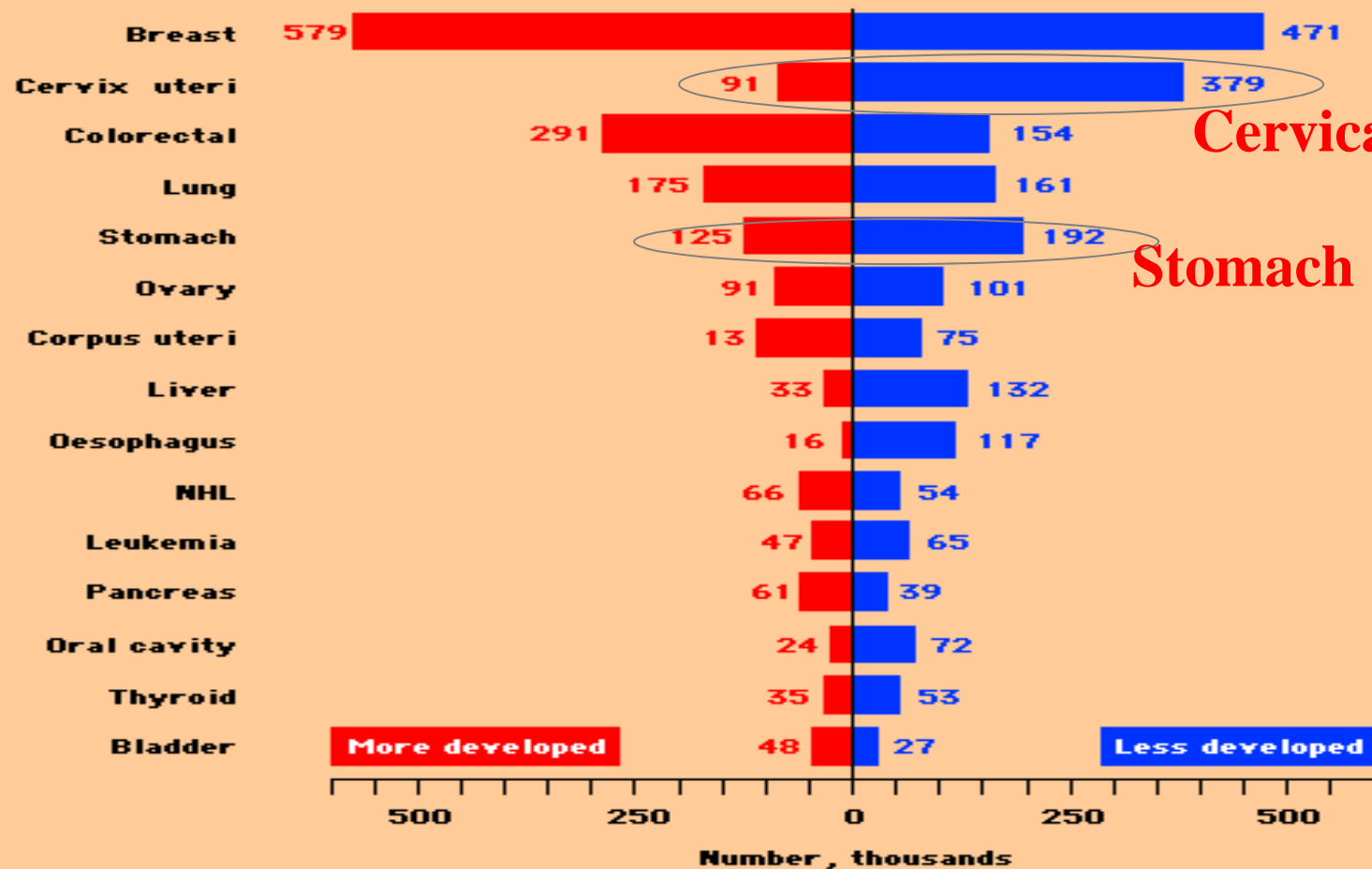


# Summary Points from These Cases

- Parasitic infections are not all associated with eosinophilia
- Common conditions may have uncommon causes once a migration/travel history is known
  - Seizures: not epilepsy but neurocysticercosis
  - Leg swelling: not a DVT but lymphatic filariasis

# Common Cancers in More and Less Developed Countries

Comparison of the Most Common Cancers in More and Less Developed Countries in 2000 for Females†



Cervical Cancer

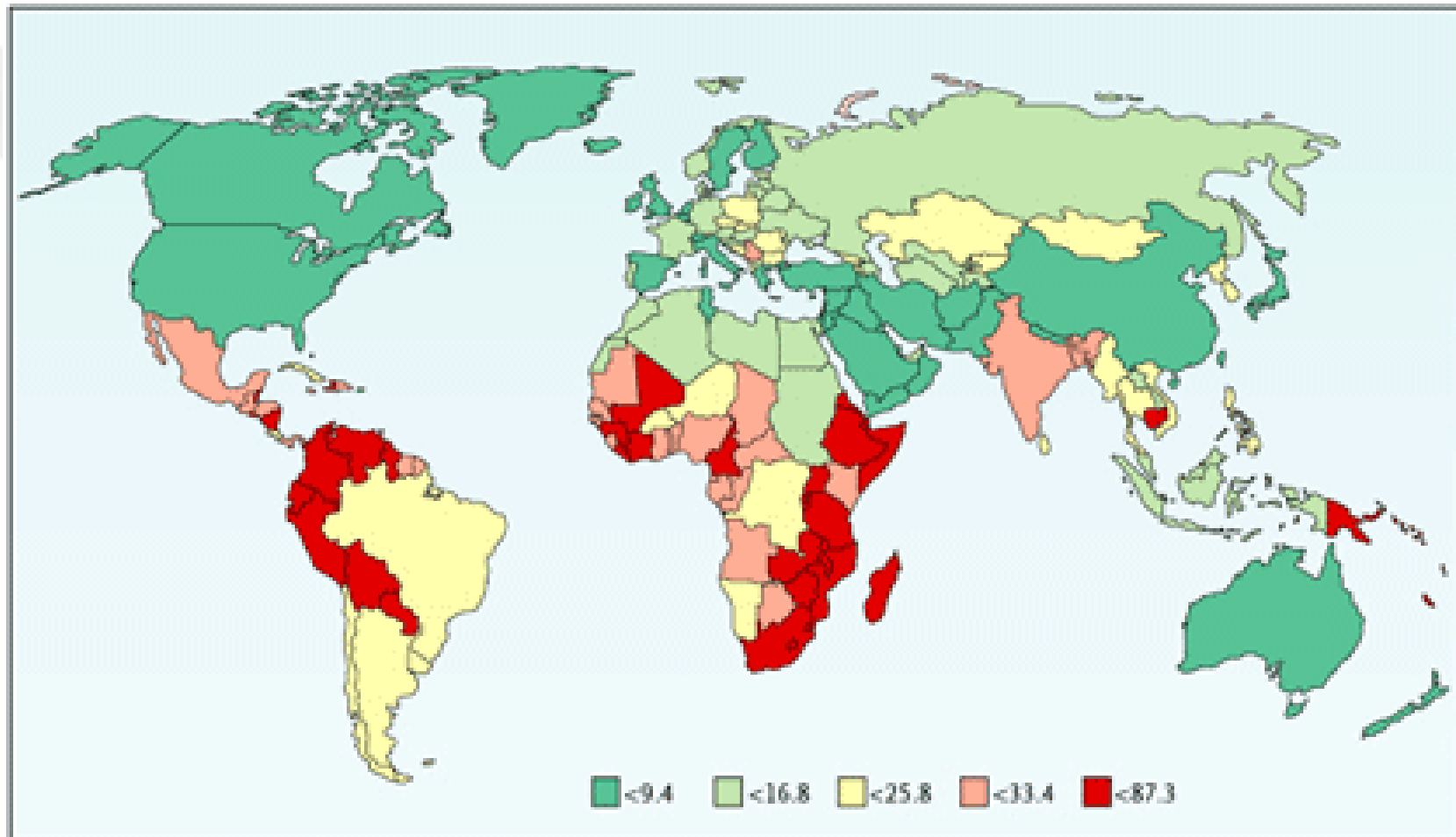
Stomach Cancer

NHL: Non-Hodgkin lymphoma.

† Stewart, B, Kleihues, P (eds). World Cancer Report. IARC Press 2003. © 2003 International Agency for Research on Cancer.

# Cervical Cancer Rates Worldwide

(Cases per 100,000 population)



Schiffman and Castle. *NEJM* 2005;353:2101.



# Cervical Cancer Screening

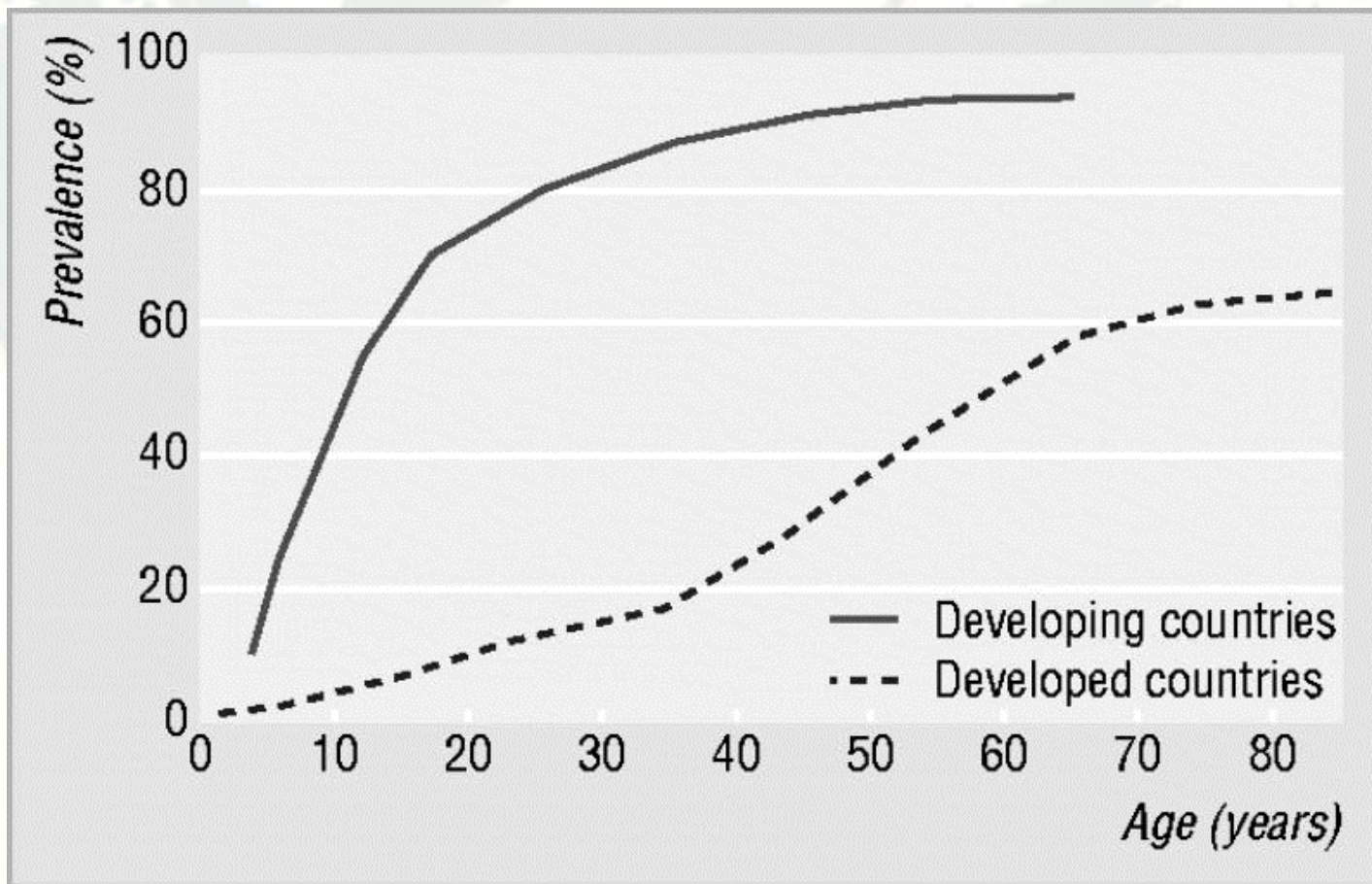
Proportion of women > 65 who had a Pap smear in the preceding 3 years

Cambodian, Lowell, MA	Vietnamese, Southern CA	Asians, National aggregate	US general population
64.2%	65.5%	74.5%	85.8%

*MMWR* 2004;53:760-767

# Health Disparities: *H pylori*

Prevalence of *H pylori* in Developed vs. Developing Countries



Logan: *BMJ*, Volume 323(7318). October 20, 2001.920-922





# Areas of Active Investigation

- Association between H pylori and diabetes?
- Association between malaria, EBV infection, and EBV associated cancers?
- Interaction between parasitic diseases and HIV and TB



# Summary Points

- Ask all patients: “Where were you born and where have you traveled?”
- Evaluate for parasitic infections all immigrants/refugees with unexplained eosinophilia (stool O and P is not enough)
- Consider uncommon causes for common signs and symptoms
- Consider multiple diagnoses
- Consider and evaluate for diseases of long latency



# Resources

- CDC Refugee Health Guidelines:  
<http://www.cdc.gov/immigrantrefugeehealth/guidelines/refugee-guidelines.html>
- Immigrant Medicine Walker and Barnett, Elsevier, 2007
- Canadian Medical Association Journal: Evidence-based guidelines for immigrants and refugees:  
<http://www.cmaj.ca/content/early/2011/07/25/cmaj.090313>



**2012 North American Refugee Healthcare Conference**  
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**Reflect** on how your work has changed your community...

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Lectures include contemporary issues in refugee health, mental health, OB/GYN, pediatrics, and primary care. Come take a look at what we have to offer and register now for this important event.

**Keynote Speakers**

**Eskinder Negash**

Director, U.S. Office of Refugee Resettlement

**Martin Cetron, M.D.**

Director, Division of Global Migration and Quarantine, U.S. Centers for Disease Control and Prevention

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**Thank you!**

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