



# The VFR Traveler Special Considerations

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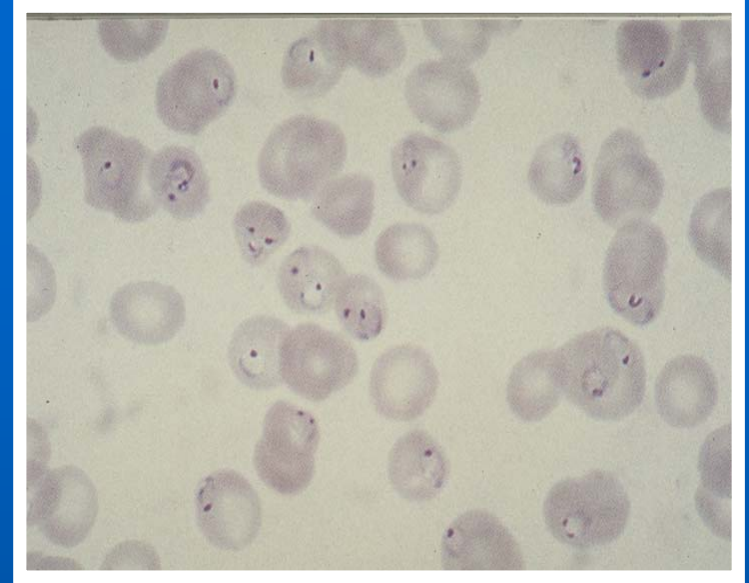
# Lecture summary

- What is a VFR traveler?
- What is the role of VFRs in travel-related and emerging infectious diseases?
- How can travel-related illness in VFRs be addressed?

# Case Scenario

- 43 year old computer programmer from Nigeria comes to see you for fevers, headache and chills January 12 after having spent the Christmas holiday with his family in Nigeria.
- He tells you he has malaria.
- He is toxic appearing on examination.

# Case Scenario



- In reviewing his record you find he presented in January 2005, 2003 and 2002 with *P. falciparum* malaria.
- *How can we do a better job in reaching the immigrant traveler?*

# VFR Definition



*“An immigrant, ethnically and racially distinct from the country of residence (citizen/resident), who returns to his/her homeland to **V**isit **F**riends and/or **R**elatives.”*  
*Keystone, 2003*

# A new definition of the VFR traveler



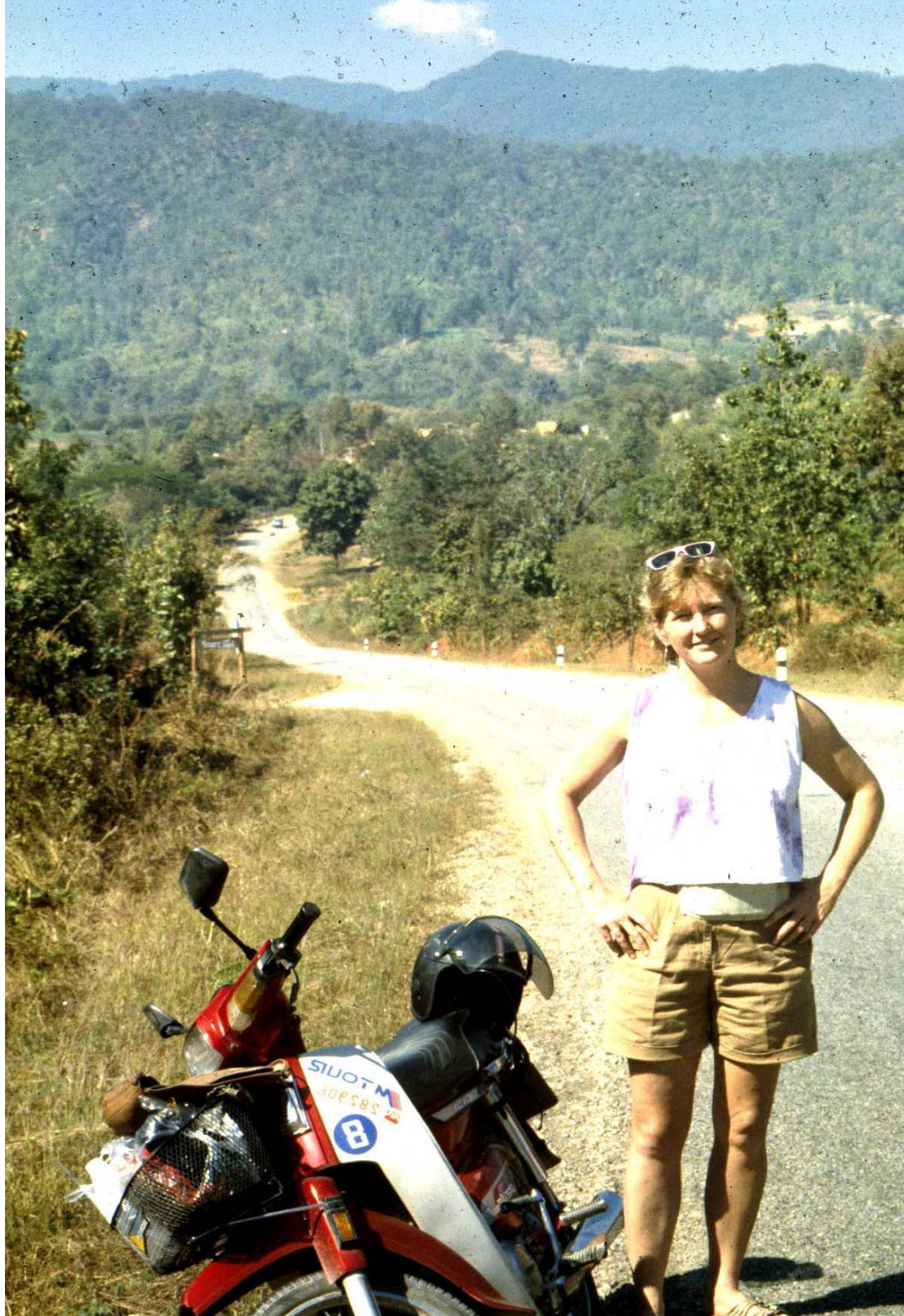
- The main intent of travel is to visit friends or relatives, AND,
- There is a risk gradient between place of departure and destination.

# Visiting Friends and Relatives

- There is a risk gradient between place of departure and destination.
  - Generally relates to
    - Traditional infectious diseases gradient (e.g. malaria, hep. A) and/or,
    - Non-infectious risks such as accidents or injury, air pollution, extremes of climate, and variations in altitude







*“Things your  
mother told  
you never to  
do while  
traveling”*

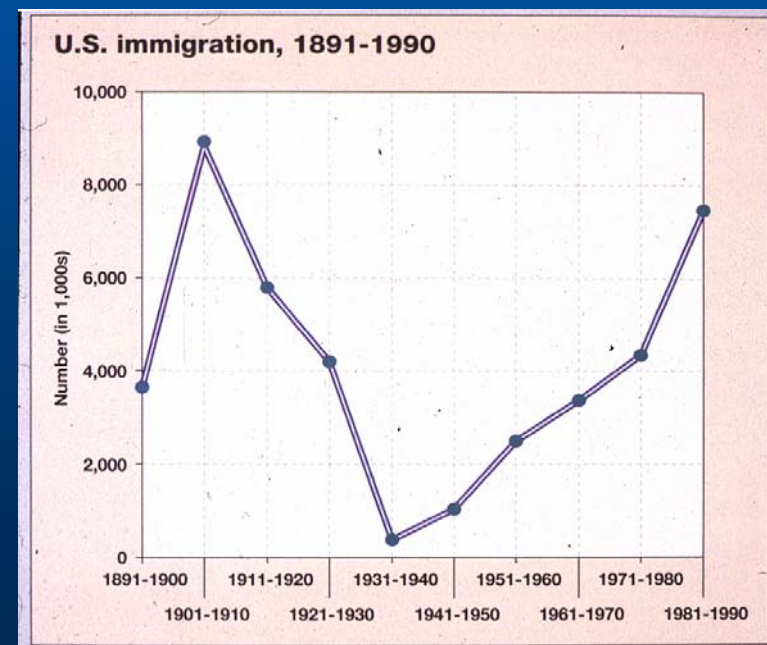
# Are These VFRs?

- A family of Chinese descent that has lived in the US for 3 generations travels to China to visit distant relatives
- A Ghanaian graduate student brings his new American wife to visit family in rural Ghana
- A family from Boston travels to visit relatives and explore the family roots in a small village in Ireland



# Why focus on VFR travelers?

- 185M people live outside their country of origin
- Speed of travel
- Immigration to US –the largest wave since 1900



# Why focus on the VRF traveler?

- Role in spread of infectious diseases (public health perspective)
- Increasing proportion of travelers worldwide
- Increased risk of infectious diseases during travel (patient and clinician perspective)

# Dengue Fever Is A Potential Threat To US Public Health, Experts Say

**ScienceDaily (Jan. 9, 2008) — A disease most Americans have never heard of could soon become more prevalent if dengue, a flu-like illness that can turn deadly, continues to expand into temperate climates and increase in severity, according to a new commentary by Anthony S. Fauci, M.D., director of the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, and David M. Morens, M.D., Fauci's senior scientific advisor.**



# Chikungunya as an example

- Outbreaks in India, Indonesia and Malaysia since 2006
- Travelers returned to N America, Europe (large outbreak in Italy in 2007), HKG and Taiwan with Chikungunya
- Chikungunya can replicate efficiently in *A albopictus*, not just *A aegypti* – potential for introducing this emerging viral infection into new areas with VFR travel

# Chikungunya Virus in US Travelers Returning from India, 2006

“The level of viremia reported in most of these imported CHIKV infections,  $>10^4$  PFU/mL, could be sufficient to infect North American vectors, given the appropriate environmental conditions.”

Robert S. Lanciotti et al  
Centers for Disease Control and Prevention, Fort Collins, Colorado,  
USA



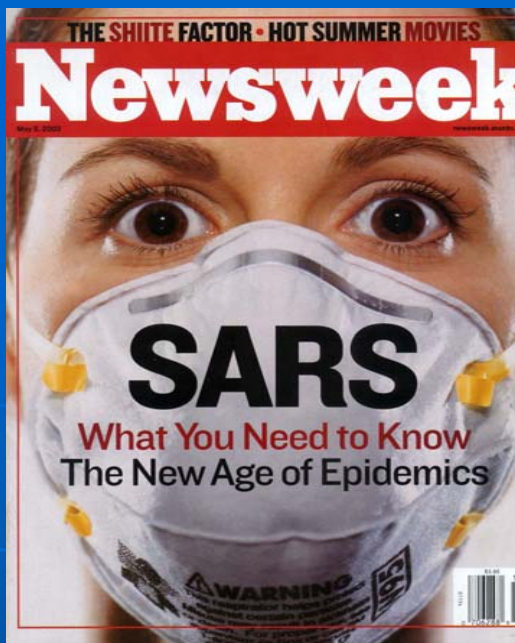
## **'Airport malaria'**

### **Experts warn of a deadly risk ready to land in many countries**

Health authorities in many countries are becoming increasingly concerned about the potentially deadly risks of malaria carried into their territory by "jet-setting" mosquitoes that travel on international flights and spread the disease, according to a study published in the August issue of *The Bulletin of the World Health Organization*.

# Travel and communicable diseases: not a new issue.....

- The influence of immigration and international travel on the transmission of communicable disease has been recognized for hundreds of years, including the introduction of smallpox, measles and typhus to the Americas during the exploration of "the New World"
- Immigration to the US, Canada and Australia has been associated with higher incidence of TB, hepatitis B, parasites and STDs in receiving countries



# Globalization of infectious and chronic diseases: the impact of migration and movement

- 200 million people (2% of world's population) reside outside their country of birth.

Gushulak BD, MacPherson DW  
CID 2004; 38(1742-1748)

- 846 million international tourist arrivals in 2006; estimates of 1.6B by 2020.

[www.unwto.org](http://www.unwto.org)

- *"There are no local diseases"*

Professor Joseph Ogong, Medical Geographer,  
interviewed on CNN regarding SARS  
5/10/03

# VFR travelers

- People who visit friends and relatives make up over 40% of all US resident travelers abroad.
- US resident VFR travelers are largely foreign born persons and their children



Health Disparities Among Travelers  
Visiting Friends and Relatives Abroad

Sonia Angell and Martin Cetron

Annals IM January 2005:Vol.142: 67-72

# Why we see so many VFR Travelers in Minnesota



# Purpose of International Travel from US

Main Purpose of Travel	1996 (%)	2001 (%)	2006 (%)
Leisure/holiday	37	39	42
VFR	25	29	31
Business	30	25	21
Convention/conference	3	2	2
Study/teaching		2	2

Office of Travel and Tourism Industries Data  
(<http://tinet.ita.doc.gov/cat/f-2006-101-001.html>)

# Purpose of Travel, UK 2003

- Ethnic groups made up 2003 population
- 14% of visits abroad were made by VFRs
- Travel to Africa made up 46% of these VFR visits
- 51% of visits to the Indian subcontinent were made by VFRs



# Illness in Travelers

## Visiting Friends and Relatives

Review of GeoSentinel data base

N=1,813

Immigrant VFRS (first generation immigrants):

- 1086 (60%) male
- Higher mean age (38.7)
- Disproportionately required inpatient treatment
- Disproportionately visited sub Saharan Africa
- Traveled for > 30 days



# Illness in Travelers

## Visiting Friends and Relatives

Review of GeoSentinel data base

N=1,813

Traveler VFRs (second generation going home with parents):

- Younger : 142 (21%) < 16 yo
- Sought more pre-travel advice
- Took slightly shorter trips
- More likely to go to Asia or Latin America

Leder et al

CID 2006;43 1185-1193

# Health disparities and Immigrant VFR travelers:

Odds ratios vs tourist travelers (95% CI)



- 8.3x risk of malaria
- 7.0x risk of typhoid fever
- 5.6x risk of influenza
- 4.8x risk of systemic febrile illness
- 3.8x risk of non-diarrheal intestinal parasite
- 1.6x risk of respiratory syndrome
- 0.3x risk of acute diarrhea
- 0.2x risk of chronic diarrhea
- 0.4x risk of dermatologic condition
- 66.7x risk of tuberculosis!

Leder et al

CID 2006;43;1185-1193

# Illness in Travelers Visiting Friends and Relatives



- Take home messages:
- Only 16% of immigrant VFRs sought pre-travel advice
- They are sick more often, with more severe illness, compared with tourist travelers
- They are at risk for many preventable infectious diseases, including malaria, influenza and typhoid fever

Leder et al

CID 2006:43 1185-1193

# Malaria and the VFR Traveler

- 125 million visits to malaria endemic countries each year
- 30,000 malaria cases in European and North America travelers per year
- VFR's are the most significant group of travelers who import malaria to non-endemic countries (21%-68% of 54,221 imported malarial cases worldwide between 1984-2007)

# Malaria in Europe

Country/Source	Proportion of Cases in VFRs/immigrants
TropNetEurope (CID 2002)	50%
France, 2000	63%
UK 1987-2006 (BMJ 2008)	64%
Italy 1985-1998	32%

# Imported Malaria - %VFR

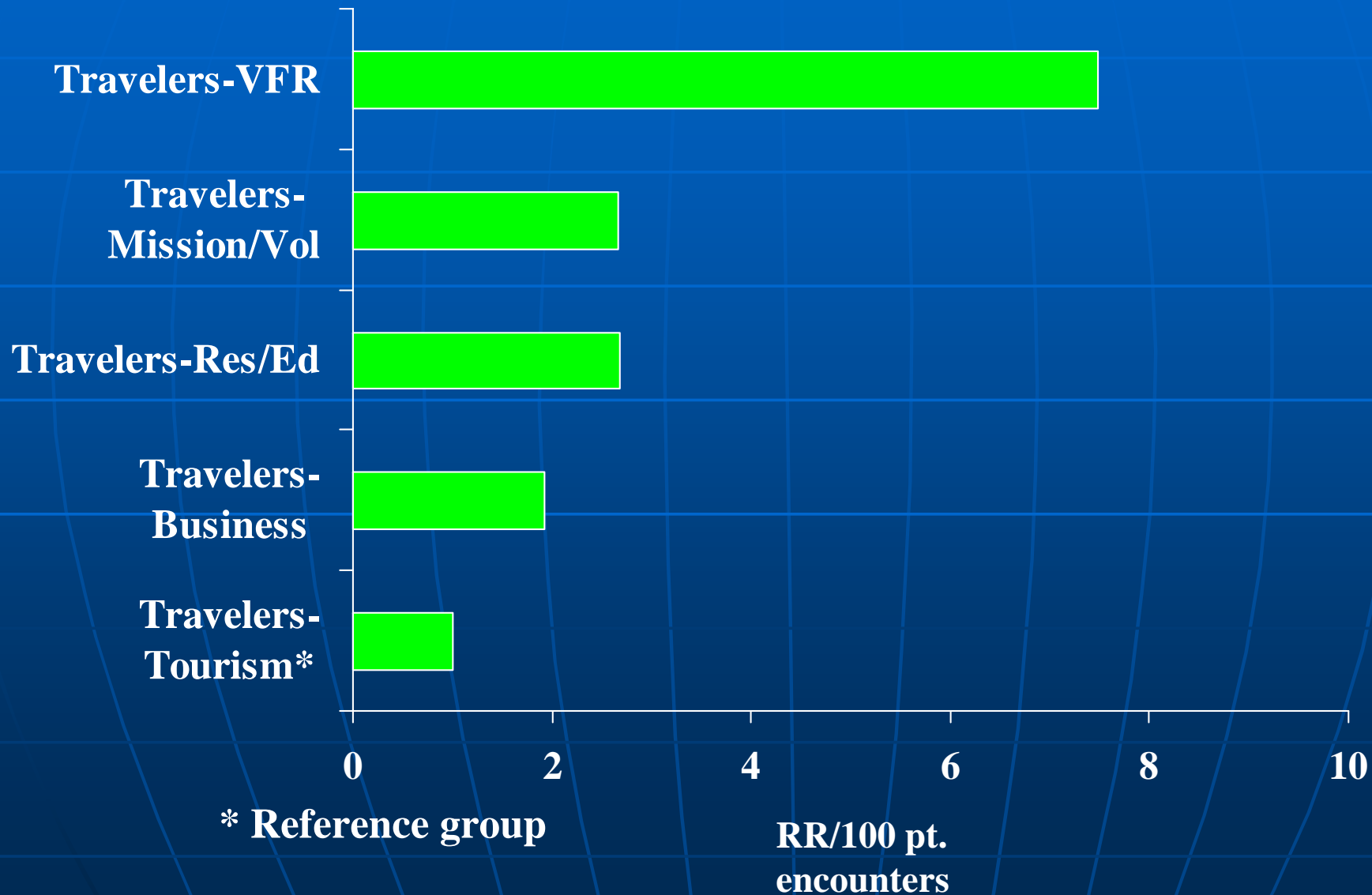
Australia	1990-1994	36.6%
Italy	1989-1997	66.9%
Switzerland	2004-2005	63.3%
US	2004	52.6%
US	2007	62.8%

# Purpose of Travel US Malaria Cases, 2005

Category	Number	Percent
VFR	488	56.1
Missionary	83	9.5
Tourism	65	7.5
Refugee/Immigrant	4	0.5
Business/education	88	11.2
Other/mixed	60	6.9
Unknown	82	9.4

MMWR 2007;56(SS06):23-38.

# GeoSentinel: Risk Ratio of Acquiring Malaria by Purpose of Travel





# Length of Stay in malaria endemic areas of VFR and other UK residents 2006

	VFRs (nights)	Non-VFRs (nights)
All countries	34.8	21.4
Central Africa	24.7	31.1
East Africa	30.1	17.2
West Africa	24.7	28.2
Indian Sub-continent	28.9	23.9

Behrens, VFR Travel in Travel Medicine 2008, from International Passenger Survey data

# Use of Chemoprophylaxis in VFRs

Country and Source	Chemoprophylaxis use (%) in VFRs	Chemoprophylaxis use (%) in non-VFRs
UK, Behrens 1993	28	75
Canada (travel to India) dos Santos	31	N/A
Lombardy, Italy, Matteelli, 1999	7.4	50
Brescia, Italy, Castelli, 1999	11	55
TropNetEurop	27.6	40

# Why Is Chemoprophylaxis Use So Low in VFR Travelers?

Lack of knowledge of risk of malaria?

- Survey of migrants (Castelli, 1999): 52% of 130 VFR travelers who did not take prophylaxis were unaware of malaria risk
- Survey of VFR travelers to India (dos Santos ): 54% sought pre-travel advice and 31% used chemoprophylaxis

# Malaria in the VFR Traveler

- Cases often occur in those travelers from a developed migration destination (ie France) and former colony (ie Comoros)
- Adult VFR's may have semi-immunity for 4 or more years
- VFR's are less likely to develop complications (3.7 vs 6.3/5) on a fatal outcome (1.2 vs 2.3%) compared to non-immune travelers
- 75% of pediatric cases are acquired in West Africa
- Children of migrant patients raised in developed countries are at high risk for severe malaria.

# Malaria risk perception in the VFR Traveler: Immigrants traveling from Canada to India

- 69% considered malaria a moderate to severe illness
- 41% believed they were not at risk of infection
- 31% intended to use anti-malarial chemoprophylaxis
- <10% planned to use mosquito protection measures

# Malaria Risk Factors in the VFR Traveler

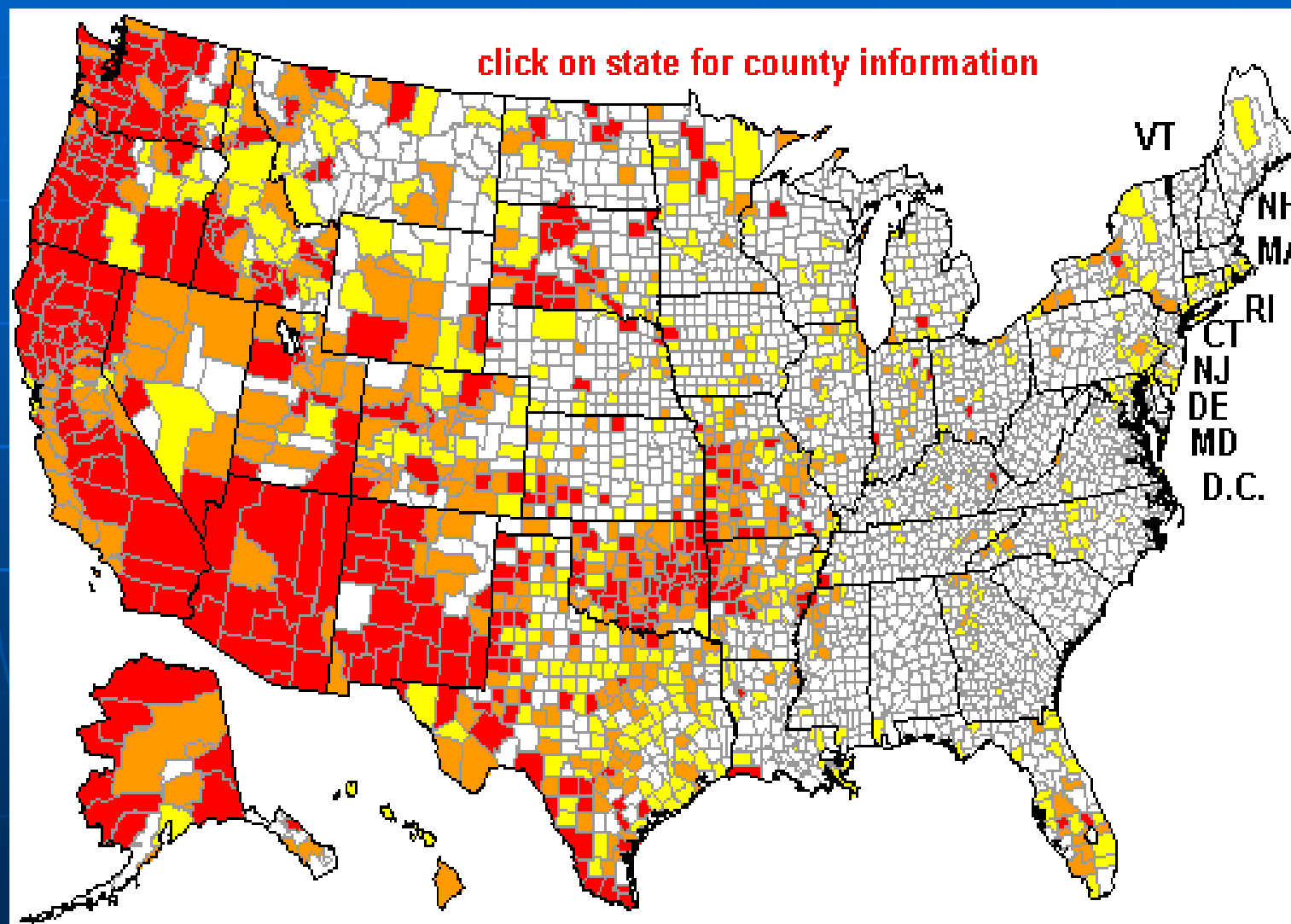
- Less likely to seek pre-travel advice; longer trips; travel with children
- Less likely to use chemoprophylaxis (49 vs 36% in one Italian study) or repellent
- Misconceptions about life long immunity; cost of pre-travel advice and medications



# Hepatitis A in Travelers

Country/Source	Proportion of Cases in VFRs/immigrants
Switzerland 1988-2004 (CID 2006)	42% imported; 28% VFR
Sweden 1997-2005 (JTM 2009)	88% VFR
Outbreak in Denmark (Epidemiol Infect 2005)	Traced to VFR children
Seasonal incidence in the Netherlands (Ned Tijdschr Gen 1998)	Corresponds to VFR summer/school vacation travel

# Average reported US cases of hepatitis A per 100,000 population\*, 1987-1997 (red > 20/100,000)





# Hepatitis A Susceptibility in New Delhi Residents

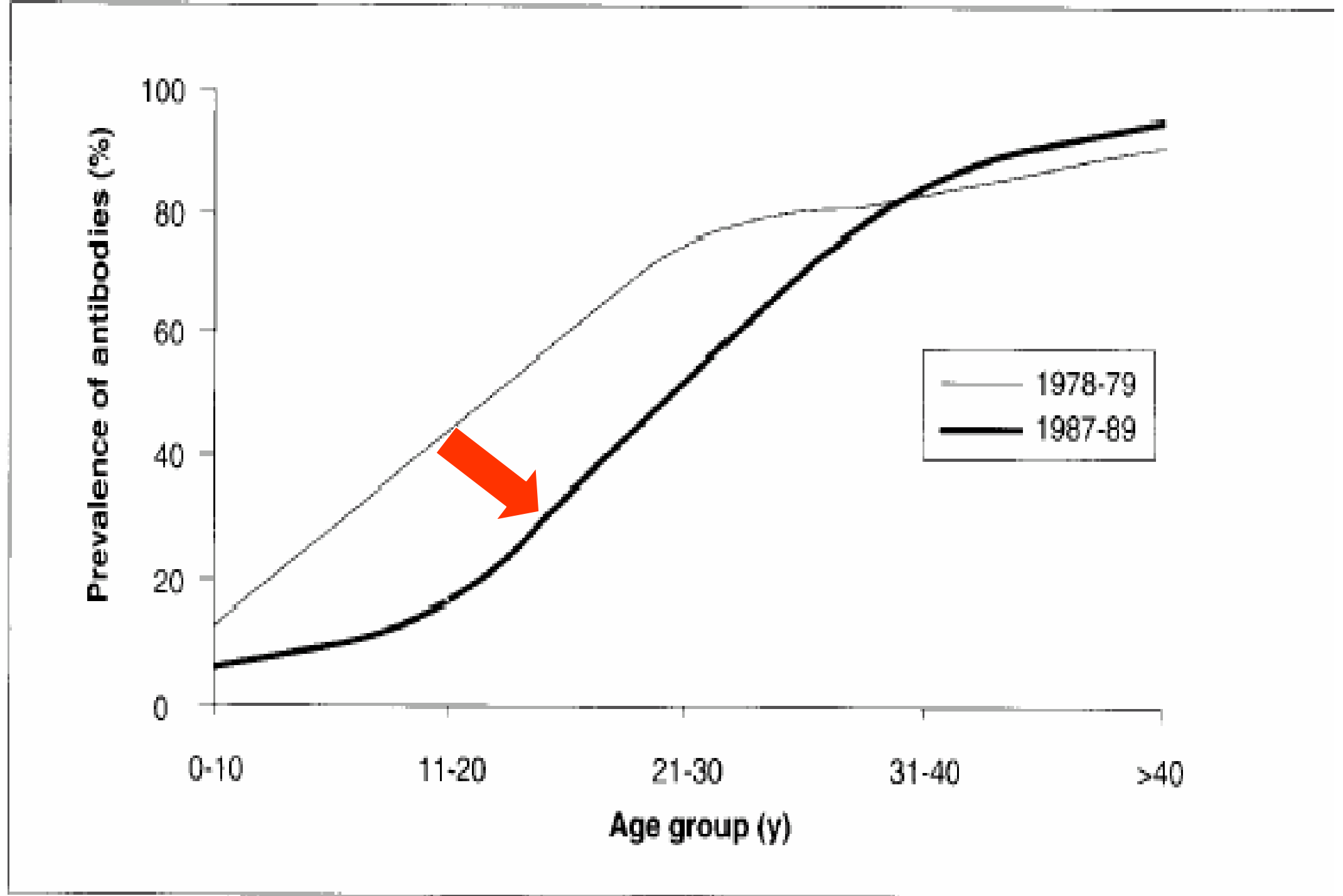
Age (yr)	No.	% Susceptible
15-24	109	46
25-34	189	41
35-44	111	13
>45	91	2
<b>Total</b>	<b>500</b>	<b>29</b>

**Das, Eur J Epidem 2000;16:507-10**

# Risk of HAV in UK travelers to India 1990-1992

Category	No./10 <sup>5</sup> /mo.	Relative Risk
VFR < 15 yrs.	120	2347
Tourist < 15 yrs.	15	295
VFR > 15 yrs.	55	1083
Tourist > 15 yrs.	57	1111

Behrens, BMJ 1995;311:193



**Fig. Prevalence of antibodies to hepatitis A in the general Hong Kong population (1978-79, 1987-89)**

## Pre travel advice and hepatitis A immunization among adult Australian travelers; 2003 telephone survey

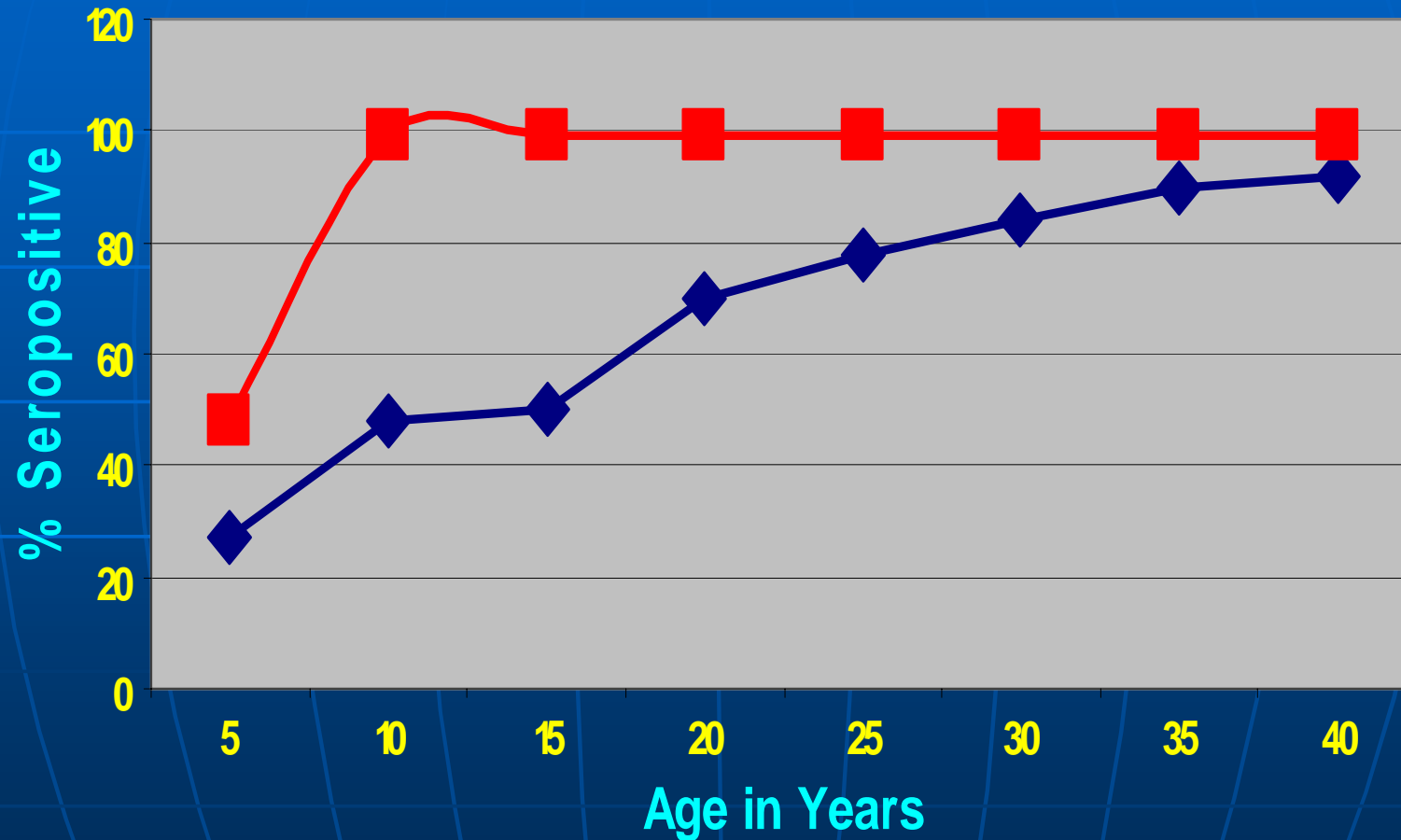
- 1/3 sought pre travel advice
- 32% had been vaccinated against hepatitis A
- 30% of VFR vs 48% of tourist travelers had received vaccine

Nzwar, Streeton et al JTM 14(1), 2007, 31-36

# Varicella Seroepidemiology

Trop Med Int Health. 1998

Nov;3(11):886-90



◆ S. Asia

■ U.S.

# Typhoid Fever and Travelers

- 22 million new cases per year worldwide
- 200,000 deaths
- Highest incidence in SC and SE Asia (>100 cases/100,000/yr)

**Basynat, Maskey et al, CID 2005;41;1467-72**

# Typhoid Fever, US, 1994-1999

- Approximately 400 cases/year
- 70% of cases from 6 countries (India, Pakistan, Mexico, Haiti, Bangladesh, Philippines)
- 77% of cases in VFRs
- 48% traveled for less than 4 weeks
- 25% were in children < 10 years of age

Steinberg ASTMH, Houston, Nov. 2000

# Immigrant VFRs and risk for STDs

- 44.5% of black Africans living in London returned to central African countries within previous 5 years.
- 40% of men and 21% of women had new sexual partner while traveling.
- 42% did not use condom.

KA Fenton et al  
AIDS 2001;15;1442-5



# Why are immigrant VFRs and their children more at risk for travel related illness?

- High risk food and beverage
- High risk transportation
- Longer trips
- Rural destinations
- Last minute travel
- Perception of risk



# Reaching VFR Travelers & Tailoring Advice

- What are some barriers to care for the VFR traveler?



Photo by Chris Phares, PhD

# Barriers to care for the VFR traveler: Patient level



- Language: 47 M (20%) of Americans speak a language other than English at home (of those, 55% spoke English well)
- Educational barriers: lower perception of risk, lack of awareness of travel medicine as a resource, belief that Western providers are not knowledgeable about tropical diseases.

# 19 yo Nigerian male returning home

- Planned 2 months trip to rural area in SE
- His mother told him there was a “diarrhea killing children and to get medicine for cholera”
- Reason he came to clinic at all: a relative had been to Nigeria within the last year and returned with malaria, so his mother told him to get an anti-malarial
- He refused all other vaccines due to cost

HealthPartners Travel Medicine patient 2007

# Barriers to care for the VFR traveler: Provider level

- Primary care providers see most of the VFR travelers in the US
- They lack expertise in travel medicine



# Primary care providers and travel medicine advice

- Survey of 1165 American and 96 Canadian travel clinics or public health units
- 20-75% inadequate or inappropriate immunizations
- 20-60% incorrect anti-malarial
- Incorrect advice re. traveler's diarrhea

Keystone et al. J Trav Med 1994 June 1;(2) 72-78

# Barriers to care :

## Health care system level

- Lack of universal access to preventive services : 47 M uninsured Americans
- Limited income even if insured
- Travel clinics are usually not located within primary care settings where immigrants seek care
- Transportation issues
- Lack of professional interpreters
- Lack of previous healthcare (i.e. immunizations) or records of care
- Legal: Concerns over immigration status/distrust in the health system
- Care delivery systems do not provide culturally competent outreach and preventive education

*How would you  
reduce barriers to  
care to improve  
health outcomes  
for the VFR  
traveler?*





# Decreasing barriers to care at the patient level

## Recommendation #1 and 2

- Language access:  
provide professional interpreters (onsite, agency or telephone service, such as Language Line)
- Hire staff which reflects the communities you serve (multi-lingual/multi-cultural)



# Decreasing barriers to care at the patient level

## Recommendation #3

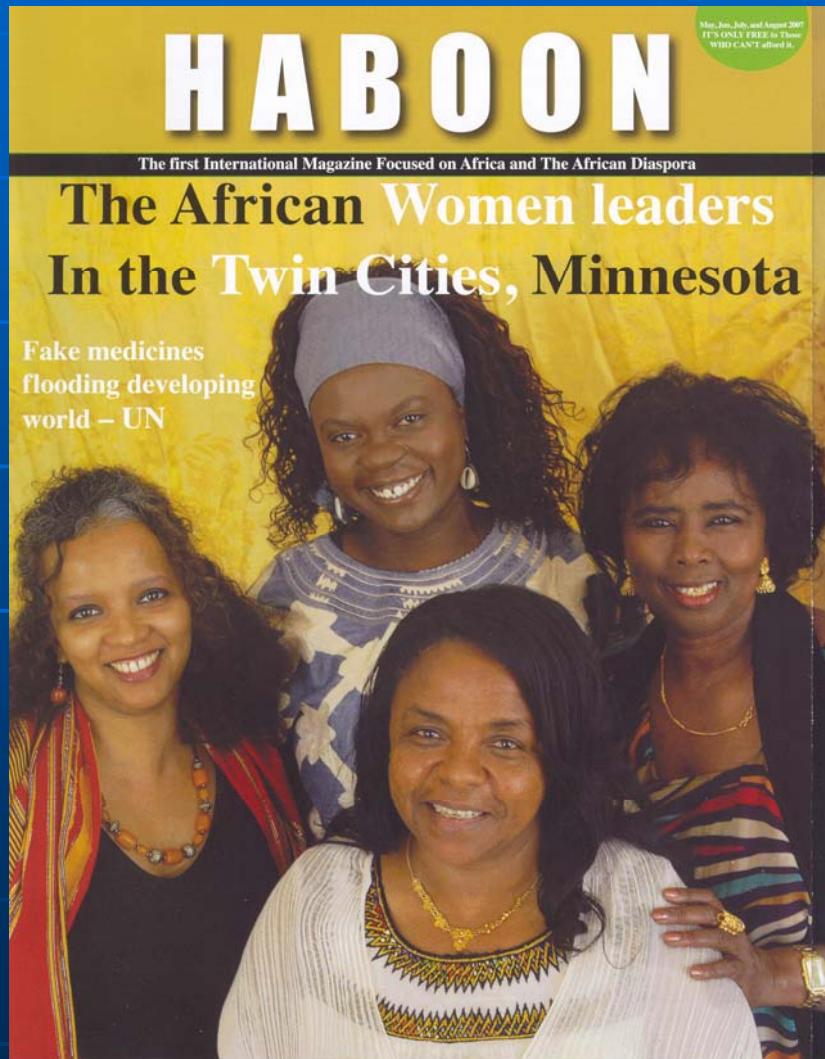
- Provide written travel medicine education materials appropriate for health literacy level and translated for patients
- [www.tropical.umn.edu/vfr](http://www.tropical.umn.edu/vfr)
- 6 handouts in 18 languages
  - Insect avoidance and malaria chemoprophylaxis
  - Travelers diarrhea
  - Trauma avoidance and evacuation insurance
  - Travel with children
  - Immunizations
  - Special issues with travel to the Hajj

# Decreasing barriers to care at the patient level

## Recommendation #4

- Community outreach and education
  - Newspapers/periodicals, radio and television programs.
  - Internet sites for immigrant communities.
  - Use of travel agents serving ethnic populations.
  - Engage community organizations

# Community Outreach



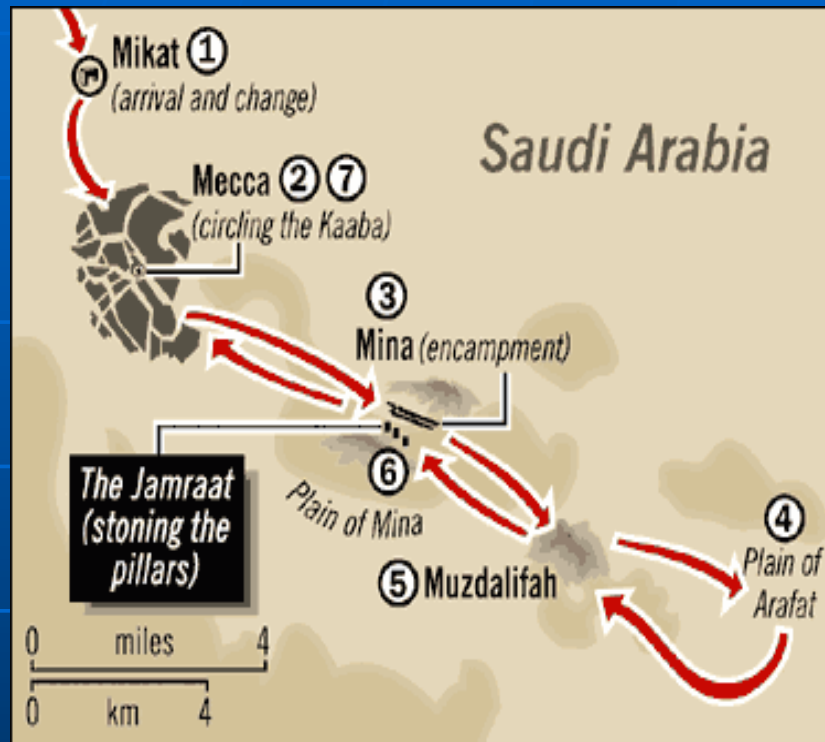
# Educational outreach works!

## Recommendation #5

- Provide ethnically and culturally specific outreach activities to improve participation in preventive health services for diverse communities.
- Focus on messages that individuals will feel are *“meant for me”*



# Current example from our clinic...target marketing for the Hajj





# A travel medicine preventive message “*meant for me*”

Your Pilgrimage  
*Awaits.*

We'll help you  
*Prepare*

Call  
952-967-7978  
for an appointment  
or visit  
healthpartners.com

**HealthPartners Travel Medicine Services**

Xajka

Diyaar garowga socdaalka xajka ee caafimaad

HealthPartners Waxay Leedahay Xarumo caafimaad oo u adeega dadka socdaalka ama safarka tegaya sida xajka

Adeegyadu waa kuwan

- Waa gaybo caafimaad oo dhaqankaaga Somaliga ah Iyo Islamka ah u nugul
- Waxa kuu turjubaanaya qof Soomali ah
- Talaalka Lagaaga baahanyahay Fiisaha xajka
- Talaalada kale ee aad u baahantahay
- Dawooyinka Safarka Sida Kuwa Shubanka, Duumada Iwm

Safar Salaama

**HealthPartners**  
Travel Medicine

- Ethnic specific
- Language specific
- Sent to local newspapers
- Previous outreach via Somali magazine, radio, and internet sites

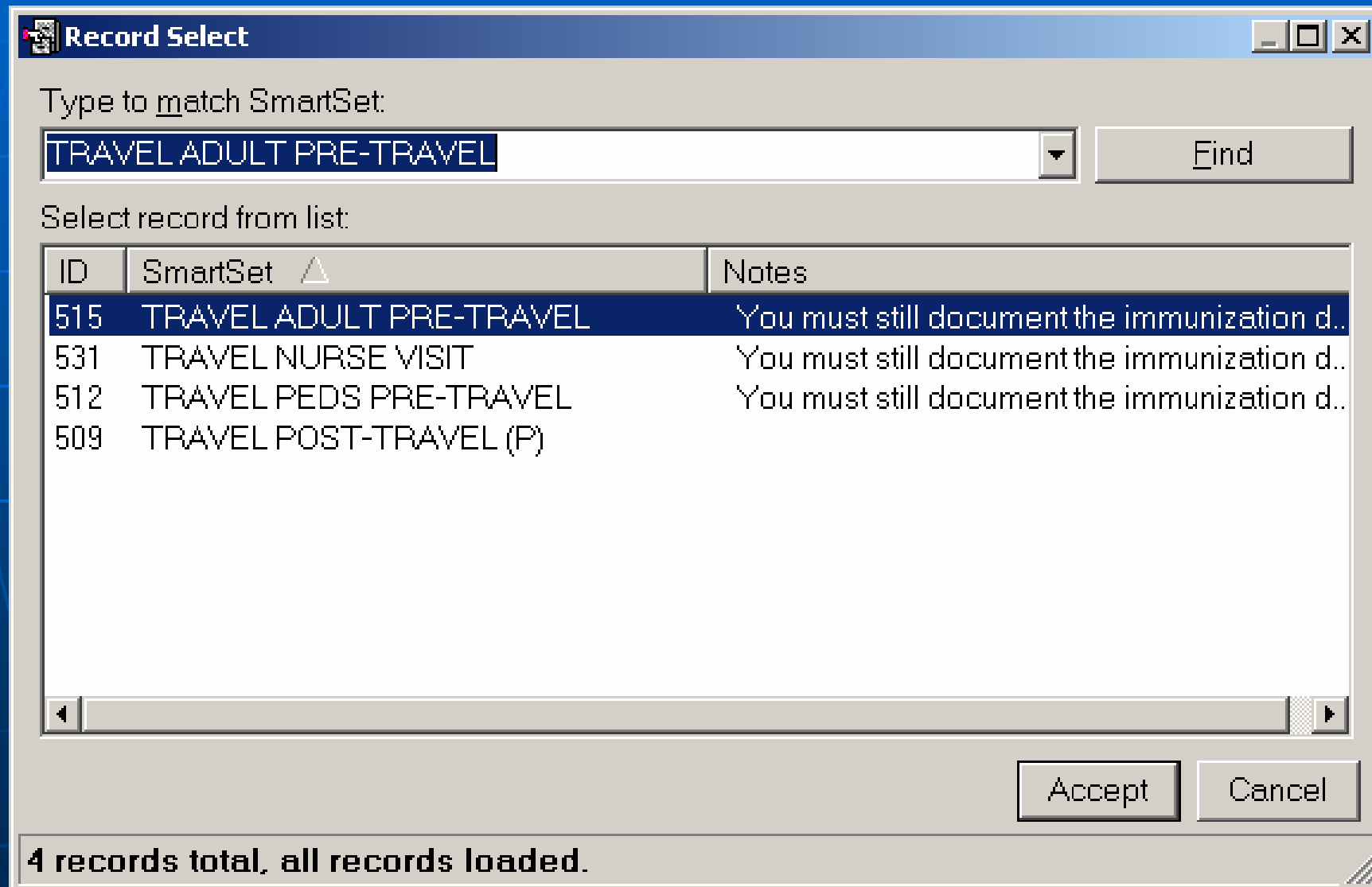


# Decreasing barriers to care at the provider level: Education

## Recommendation #6

- Train primary care colleagues in pre-travel medicine
- Develop and share electronic best practice order sets
- Encourage referrals, or encourage advanced training in travel medicine
- In every clinical encounter, ask the question: "Have you traveled recently, or do you plan to travel in the near future"

# EPIC - International Travel smart set




Record Select

Type to match SmartSet:

TRAVEL ADULT PRE-TRAVEL Find

Select record from list:

ID	SmartSet 	Notes
515	TRAVEL ADULT PRE-TRAVEL	You must still document the immunization d..
531	TRAVEL NURSE VISIT	You must still document the immunization d..
512	TRAVEL PEDS PRE-TRAVEL	You must still document the immunization d..
509	TRAVEL POST-TRAVEL (P)	

Accept Cancel

4 records total, all records loaded.

Test, Amy Status Age Sex DOB MRN Prim Loc Allergies PCP Alerts INS MyChart  
52 yr F 1/1/1955 50473927 EMR Amoxicillin, \* UNASSIGNED,\* HM (None) Inactive

- Snapshot
- Chart Review
- Results Review
- Flowsheets
- Problem List
- Health Maintenance
- History-Summary
- History-Edit
- Letters
- Appointments
- Demographics
- Growth Chart
- Graphs
- Open Orders
- Medications
- Allergies
- Imm/Injections
- Refraction
- Order Entry
- Doc Flowsheets
- Visit Navigator
- SmartSet Selector
- SmartSet - TRA...

### SmartSet - TRAVEL Adult Pre-travel

Association Primary Dx Edit Item Favorite Pharmacy Questionnaire Health Maint Accept/Pend Accept/Sign Cancel

- DOCUMENTATION
  - Visit Note (multiple)
    - INTERNATIONAL TRAVEL
    - This progress note has been dictated.
  - LAB Orders
    - ... (multiple)
      - HEP A VAC SCREEN [3358]
      - HEPATITIS B CORE,AB [0185]
      - HBSAG (HEPATITIS B SURFACE AG) [0186]
      - HEPATITIS B SURFACE, AB [0510]
      - HEPATITIS C AB [0982]
      - MUMPS IMMUNE STATUS [2006]
      - PREGNANCY TEST (URINE) [0195]
      - RABIES ANTIBODY [0825]
      - RUBELLA IMMUNE STATUS [0241]
      - RUBEOLA IMMUNE STATUS [2014]
      - V ZOSTER IMMUNE STATUS (Varicella) [2012]
    - Associated Diagnoses (multiple)
  - Screening
    - Order (multiple)
      - SKIN TEST; TUBERCULOSIS INTRADERMAL(V74.1) [86580]
    - Diagnosis (multiple)
      - SCREEN PULMONARY TB [V74.1]
  - IMMUNIZATIONS

Right click data row to edit | Loading SmartSet succeeded.

**Authorizing Provider**

QQ [7] ...

Cosign for Procedures

**SmartSet Notes**

You must still document the immunization details and questions via the SmartForm.

- Legend**
- Standing order
  - Future order

# Decreasing barriers to care at the system level Recommendation #7

“Location, location,  
location”

Take travel medicine  
to at risk  
populations-not the  
other way around



# Survey of immigrant families in the Bronx, New York

- N=129
- Parents of children born in malaria endemic countries who present for routine health maintenance visit
- 36% planned to travel within 12 months
- 35% planned to travel but not certain when
- Only 9% had no plans to travel
- With over 90% of parents reporting future travel plans to a risk area for malaria and over 1/3 with firm imminent travel intentions, this study highlights the appropriateness of using a routine outpatient visit among immigrant groups as an educational opportunity

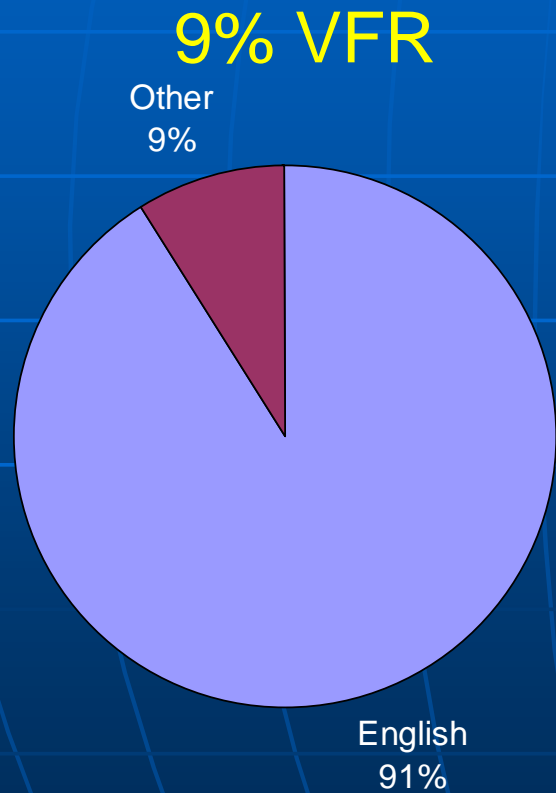
S Hagman et al  
JTM 17(3) 193-196

# Illness in Children After International Travel: GeoSentinel Analysis Jan 1997-Nov 2007

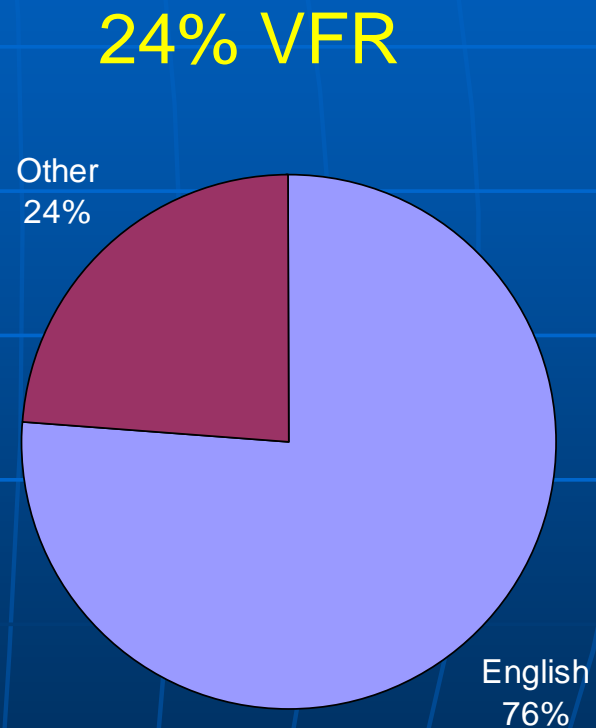
- N=1591
- Predominantly traveled to Asia, SS Africa, C America
- Compared with adults, children disproportionately:
  - presented within 7 days of return
  - required hospitalization
  - traveled for purpose of VFR
  - lacked pre-travel health advice

S Hagmann, R Neugebauer et al  
Pediatrics 2010; 125; e1072-1080

# Travel Clinic not co-located at the Center for International Health:



# Travel Clinic co-located at the Center for International Health:



# Tailoring pre-travel advice to the VFR traveler

- **Clinical Suggestions**
- Start with asking the patient what they know
  - **What do you think you are at highest risk for on this trip?**
  - **What do you know about malaria?**
  - **How do you plan to obtain potable water?**
  - **How do you plan to get around?**
  - **Are you concerned about the cost of today's visit (negotiate and prioritize)?**
  - **What are your plans if you got sick or had an accident?**



# Tailoring pre-travel advice to the VFR traveler

## ■ Clinical Suggestions

- Frequent hand washing (use of alcohol based hand sanitizers)
- Stress boiling (or bottled) water and avoiding high risk food items
- Use simple medication regimens (i.e. single dose standby TD therapy)
- Sell difficult to obtain travel items at wholesale in the clinic (i.e. permethrin)

# Tailoring pre-travel advice to the VFR traveler

## ■ Clinical Suggestions

- Access and use translated informational handouts ([www.tropical.umn.edu](http://www.tropical.umn.edu))
- Stress trauma avoidance (i.e. night-time driving, motorcycles, bicycles)
- Tailor vaccine recommendations (i.e. hepatitis A, typhoid)
- Discuss blood/body fluid precautions
- Choose inexpensive medication when given an option (i.e. doxycycline for malaria chemoprophylaxis).

# Vaccine Special Considerations

- Tetanus/diphtheria
  - May have never received primary series (if unsure, may check serology and give booster if necessary).
- Measles
  - May have never received primary series (if unsure, may check serology and give booster if necessary).
- Varicella
  - Less likely to have had disease or vaccine, if no history of disease, either check serology or immunize.

# Vaccine Special Considerations



## Hepatitis A

Likely to be already immune if >20 years at time of immigration, check IgG serology. Higher risk of disease if non-immune.

## Hepatitis B

Should have been screened and vaccinated during immigration to the United States. Higher risk of acquiring disease and need immunization if antibody and antigen negative (i.e. no prior infection).

## Polio

May have never received primary series (if unsure, check serology; if had primary series, give booster if destination is considered at risk).

# Vaccine Special Considerations

## **Typhoid** (*Salmonella typhi*)

Higher risk for disease, lower threshold for vaccination with potential exposure (when language or cost is a barrier, a single-dose IM may be more practical).

77% of typhoid from 1994-99 was among VFRs

## **Rabies**

Expensive (\$500-\$1000). Children at higher risk (50%) of fatalities; 60% of dog bites occur in or around the home.

## **Meningococcal**

Higher risk at specific destinations [Africa, Saudi Arabia] due to close contacts. Lower threshold for use in VFR travelers to endemic areas.

## **Influenza**

The seasons (winter) are opposite in the northern and southern hemispheres, (Immunizations assist in eliminating confusion in diagnosis for SARS, Avian Flu)

## **Yellow fever and Japanese Encephalitis**

Assume same risk

# Conclusions

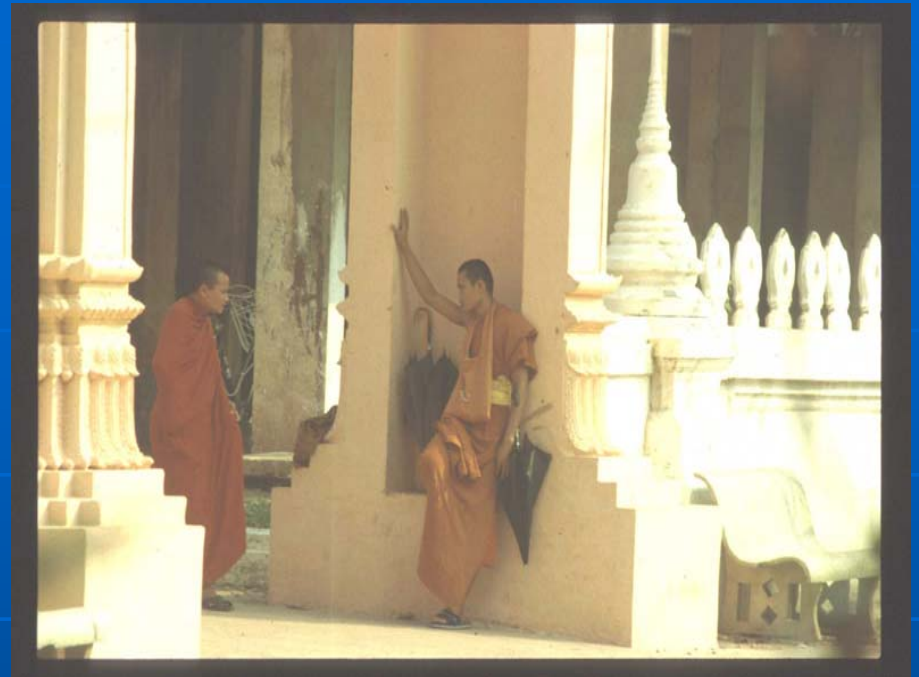
- VFR travelers make up an increasing proportion of travelers
- VFRs are at increased risk of certain travel-related infections
- Methods designed to reduce travel-related infections must take into account the specific needs and issues of VFR travelers
- Addressing morbidity in VFR travelers could disrupt the cycle of transmission of preventable disease in communities at home and abroad

***“We must ask  
what is best for  
the world; we  
are dealing with  
closed systems”***

**Dr Bill Foege  
Carter Center**



*Krop khun mak kha!*



“As the traveler who has once been from home is wiser than those who have never left their own doorstep, so a knowledge of another culture should sharpen our ability to scrutinize more steadily, to appreciate more lovingly, our own.”

-Margaret Mead