

# Disease Surveillance in Travelers

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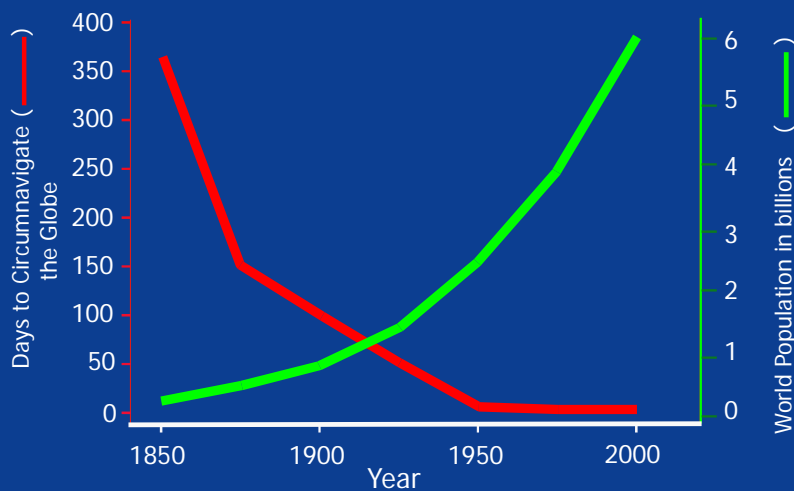
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## Outline

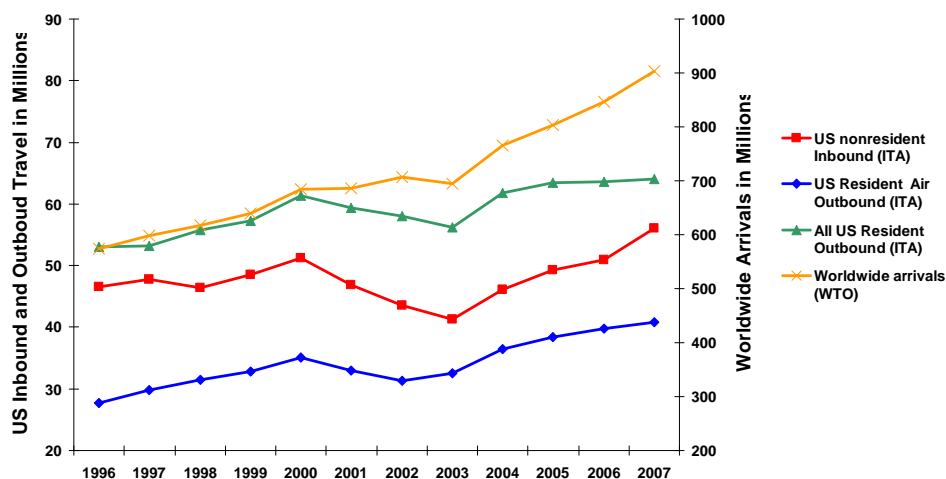
- Travel trends
- Illness in travelers
- Disease surveillance in travelers
  
- GeoSentinel
- Surveillance of travelers in Mexico
- Hotel-based surveillance in Jamaica

## Speed of Global Travel in Relation to World Population Growth

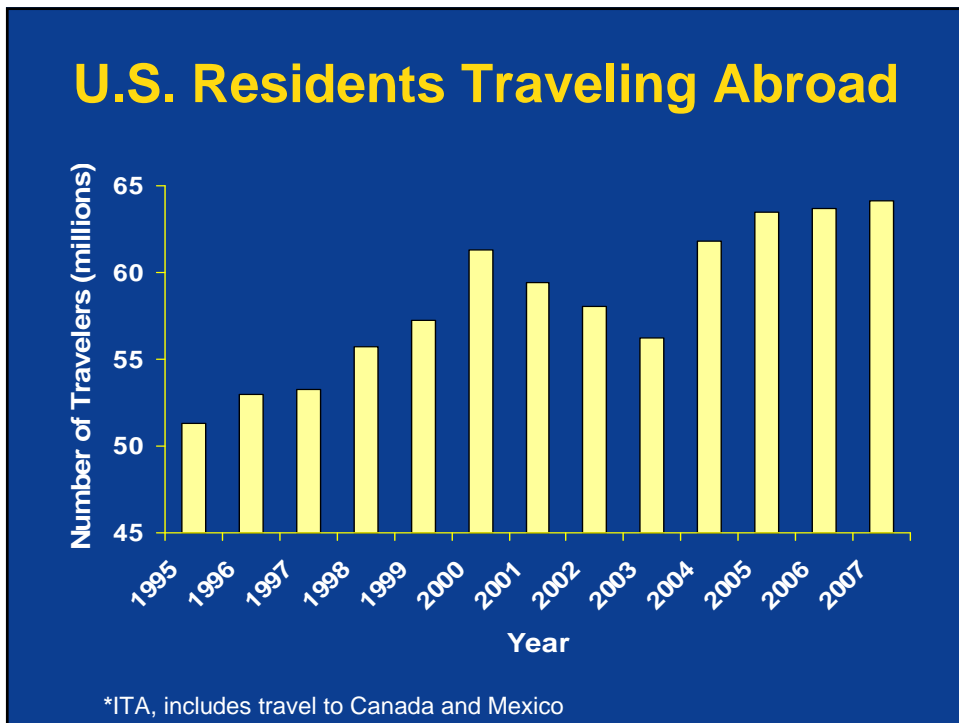


From: Murphy and Nathanson Sems. Virol. 5, 87, 1994

## International Travel Trends

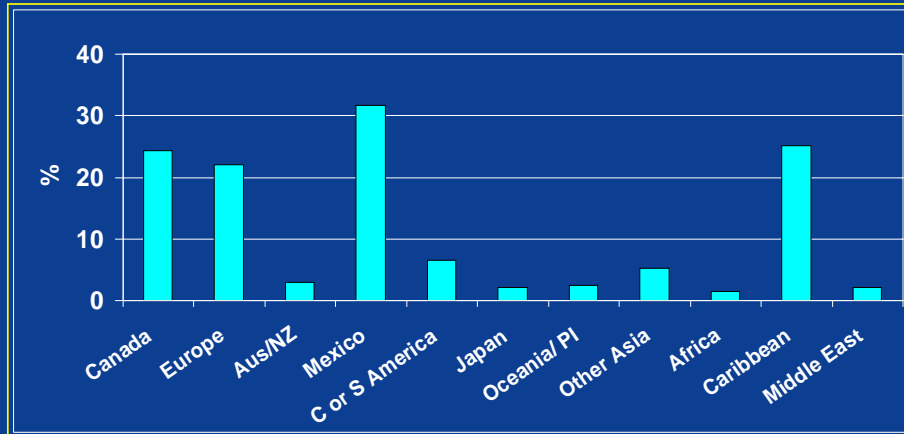


Sources: International Trade Administration (ITA), U.S. Department of Commerce, 2008 and World Tourism Organization (WTO), 2008



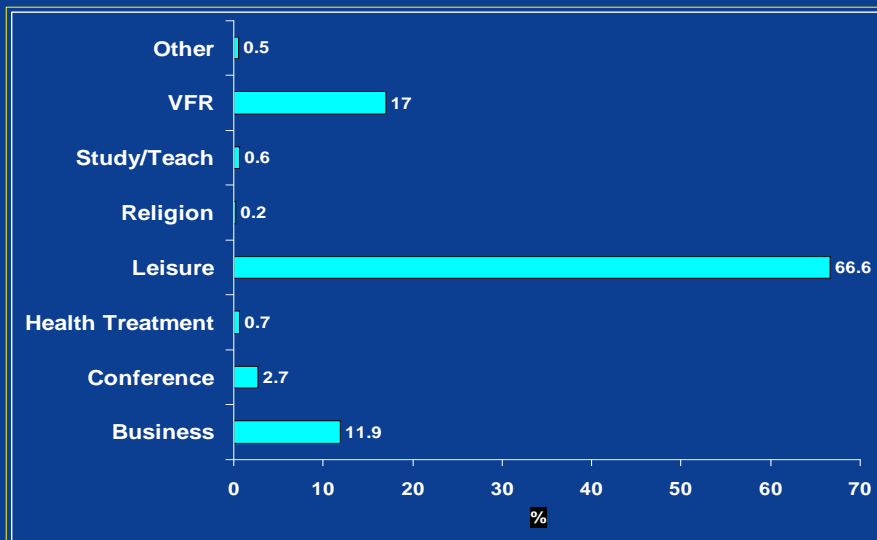
## U.S. Resident's Travel Destinations

17% of U.S. residents traveled outside the country



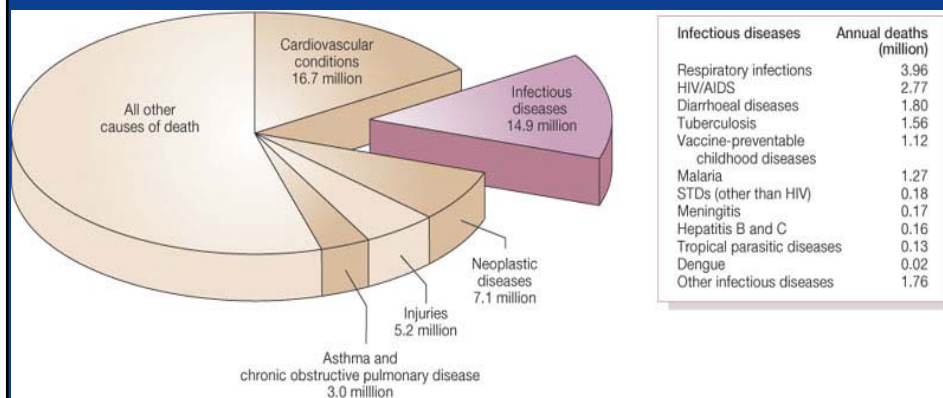
Source: HealthStyles Survey 2005

## U.S. Resident's Purpose of Travel



Source: International Trade Administration (ITA)

## Leading Causes of Death Worldwide



About 15 million (>25%) of 57 million annual deaths worldwide are the direct result of infectious disease.

Figures published by the World Health Organization (see <http://www.who.int/whr/en>).  
From "The Challenge of Emerging and Re-emerging Infectious Diseases." David M. Morens, Gregory K. Folkers & Anthony S. Fauci. Nature 430, 242-249(8 July 2004)

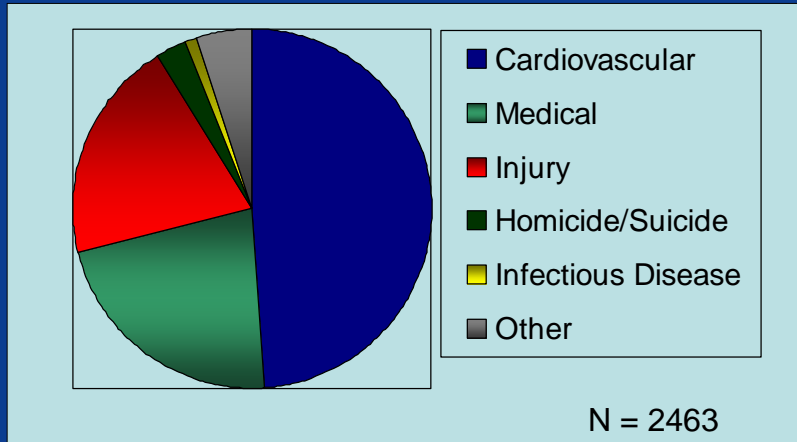
## Travelers' Health Risks

**Of 100,000 travelers to a developing country for 1 month:**

- 50,000 will develop some health problem
- 8,000 will see a physician
- 5,000 will be confined to bed
- 1,100 will be incapacitated in their work
- 300 will be admitted to hospital
- 50 will be air evacuated
- 1 will die

Steffen R et al. J Infect Dis 1987; 156:84-91

## Deaths Related to International Travel



Hargarten S et al, Ann Emerg Med, 1991. 20:622-626

## Impact of Tourism

- World travel & tourism contributed \$5,890 billion to global GDP in 2008
- Mexico:
  - \$157.6 billion (ranked 10<sup>th</sup> in world)
  - 6,633,000 jobs (ranked 5<sup>th</sup> in world)

Source: World Travel and Tourism Council

## Impact on Tourism



## PAHO Vision for Health & Tourism

- **144<sup>th</sup> session of Executive Committee**  
– 22-26 June 2009
- **Resolution on Health and Tourism:**  
“Promote and maintain sound epidemiological surveillance mechanisms, which could include the establishment of national hotel health surveillance systems in every country in the region.”

Source: Provisional agenda for PAHO 144<sup>th</sup> Session of Executive Committee, 11 May 2009

## **Studies of Illness in Travelers**

- **Pre-travel**
- **During travel**
- **Post-travel**

## **Pre-travel Studies: Travelers' Health Research Centers**

- **Travel medicine clinics**
  - focus on research
  - promote the health of travelers
- **Boston Area Travel Medicine Network**
  - 5 centers in Boston area
- **Global Travelers Health National Research Center Consortium**
  - 10 centers across U.S.

## Surveillance During Travel

- Not well studied in medical literature
- Most studies focus:
  - GI disease
  - Environmental conditions affecting GI disease
- Few studies on other diseases:
  - Hotel based surveillance
  - Includes GI, respiratory and injury

## Surveillance Opportunities in Tourists

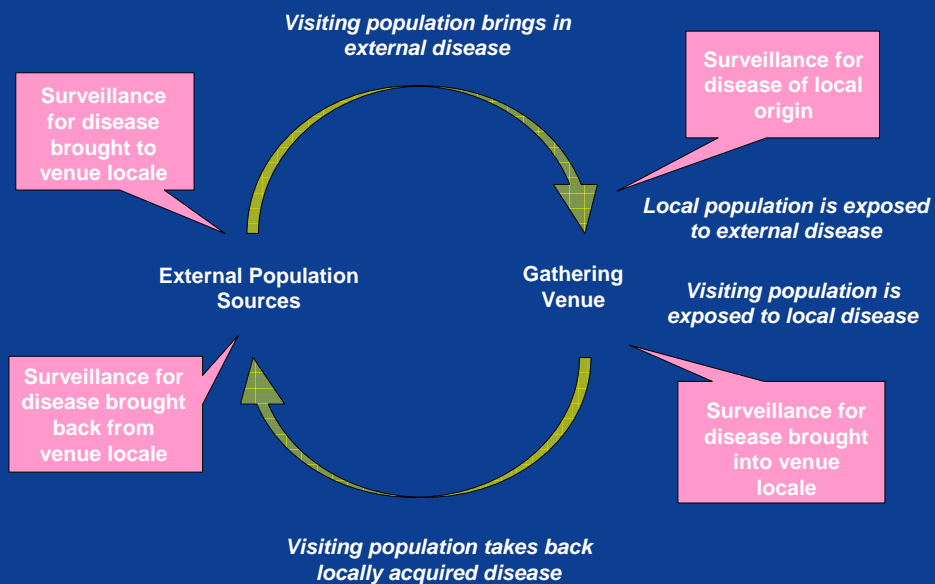
- Entry or exit:
  - Border crossings
  - Ports
  - Airports
- Accommodations:
  - Hotels, resorts
  - Cruise ships
- Visits to local providers:
  - Clinics catering to travelers
  - Local clinics or hospitals

## Surveillance at Mass Gatherings

- Olympics, World Cup, The Hajj
- Mass movements
- Risks in health and security
- Disease surveillance essential



## Population Movements and Surveillance



## European Surveillance Scheme for Travel Associated Legionnaires' Disease

- Legionnaires' disease associated with buildings such as hotels
- EWGLINET established in 2002
- 35 participant countries
- 2005: 750 travel associated cases
  - In 60 countries
  - Over 90 clusters



**Thank you**

**Questions?**

