

# Control of Infectious Diseases Related to Air Travel

Great Lakes Border Health Initiative  
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## Overview

- Overview of CDC's Quarantine program
- Illness Reporting Requirements
- Surveillance at Ports of Entry
- Response to Illnesses Related to Air Travel
  - Contact Investigations and outcomes
- Air Travel and Border Restrictions

## Number of Persons Entering the United States, 2005

Port	Daily	Annual (millions)
<b>Air</b>	<b>219,000</b>	<b>80</b>
<b>Sea</b>	<b>71,000</b>	<b>26</b>
<b>Land</b>	<b>874,000</b>	<b>319</b>
<b>Total</b>	<b>1,164,000</b>	<b>425</b>

Source: Securing America's Borders at Ports of Entry; Office of Field Operations Strategic Plan FY 2007-2011; Customs and Border Protection. Accessed at: [www.cbp.gov](http://www.cbp.gov)

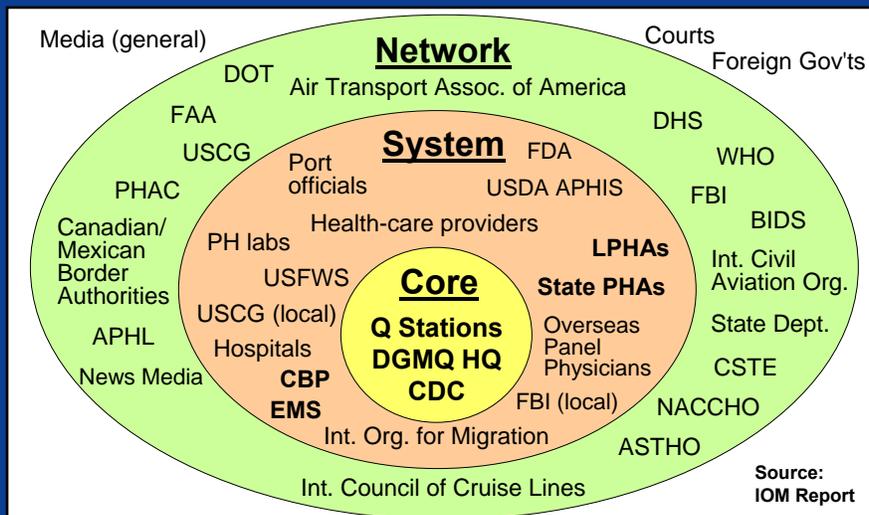
## CDC U.S. Quarantine Stations 2008 Jurisdictions



## Quarantine and Border Health Services Branch Mission

To protect the health of the public from communicable diseases through science, partnerships and response at U.S. ports

## Quarantine Core System and Network for U.S. Ports of Entry



## Foreign Quarantine Regulations Title 42 CFR Part 71

- Requires illness/death reporting by commander of an aircraft or master of a ship
  - Fever (lasting > 48 hours) or
  - Fever (of any duration) +
    - rash
    - swelling of the lymph glands
    - Jaundice
    - diarrhea
- CDC also requests reporting of
  - Fever (of any duration) +
    - Difficulty breathing or pneumonia
    - Cough
    - Reduced consciousness
    - Unexplained bleeding

## Executive Order 13295 Revised List Of Quarantinable Communicable Diseases

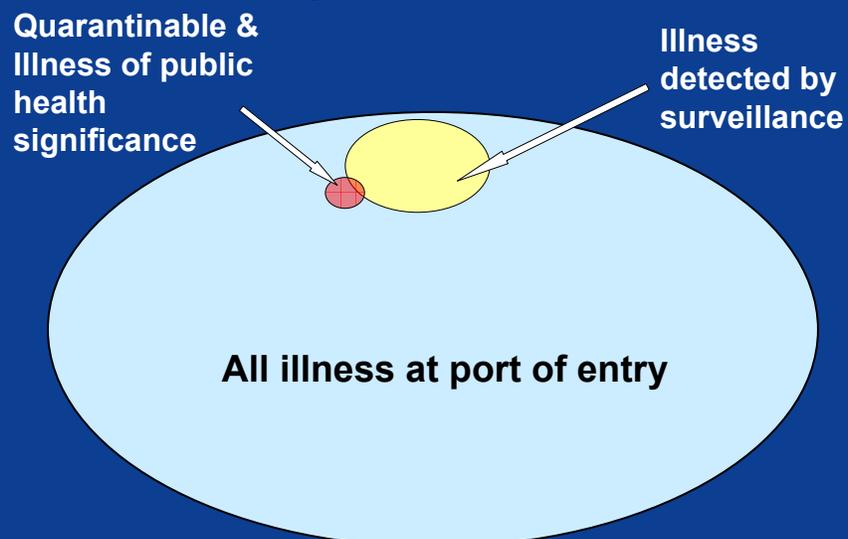
- Cholera, Diphtheria, **infectious Tuberculosis**, Plague, Smallpox, and Yellow Fever
- Viral Hemorrhagic Fevers (Ebola, Marburg)
- Severe Acute Respiratory Syndrome (SARS)
- Novel Influenza Virus (pandemic potential)

## Other Communicable Illness of Public Health Importance\*

- Malaria, typhoid, **varicella**, rabies, **meningococcal**, legionellosis, dengue, **measles**, polio, zoonotic poxvirus, **pertussis**, **mumps**, **rubella**, infectious diarrhea, other

\* Based on potential to a) cause significant morbidity and spread within the US; b) spread among passengers; c) be controlled by pharmaceutical and/or non-pharmaceutical interventions.

## Surveillance at Ports of Entry, Conceptual Framework



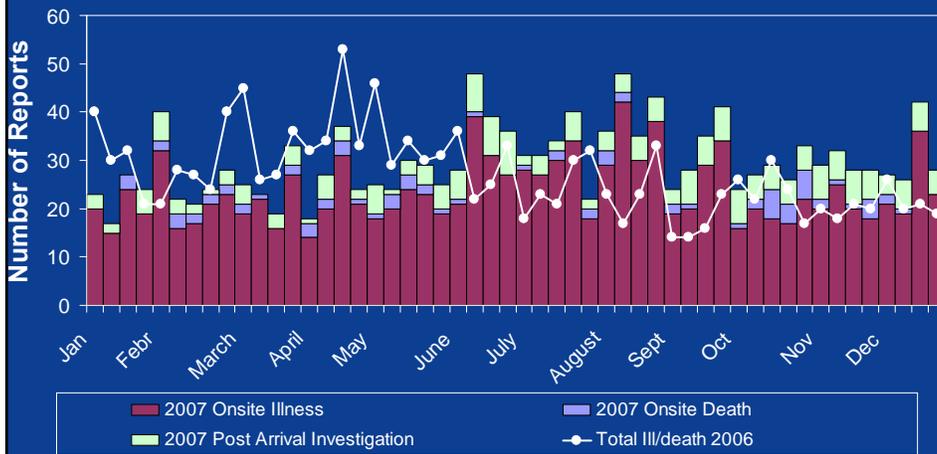
## **Surveillance Opportunities at Ports of Entry**

- **Pre-arrival**
  - Illness reported from the conveyance while en route
- **At time of arrival**
  - Illness reported while passengers are in the customs and immigration area
- **Post-arrival**
  - Illness reported days to weeks after travel

## **Surveillance at Ports of Entry: Challenges and Limitations**

- **Screening for disease relies on passive reporting**
- **For illness reported pre- or during arrival**
  - Reporting lacks specificity
  - Lack of diagnostic tools at ports of entry
- **Non-standardized practices and reporting across stations & partners**

### Ill Travelers and Deaths Reported to Quarantine Stations, by Week, U.S., 2006 and 2007\*



\* Provisional data

Source: Quarantine Activity Reporting System, Versions 4.1 - 4.3, 2007, Division of Global Migration and Quarantine, National Center for Preparedness, Detection, Control of Infectious Disease, Centers for Disease Control and Prevention

### Illness and Death Reports by Port of Entry, 2006 – 2007\*

Port of Entry	2006	2007	Total (%)
<b>Air</b>	<b>1240</b>	<b>1248</b>	<b>2488 (83%)</b>
Sea	169	190	359 (12%)
Land	9	82	91 (3%)
Unspecified	47	24	71 (2%)

\* 2007 is Provisional data

Source: Quarantine Activity Reporting System, Versions 4.1 - 4.3, 2007, Division of Global Migration and Quarantine, National Center for Preparedness, Detection Control of Infectious Disease, Centers for Disease Control and Prevention.

## **Air Travel Illnesses Reported Pre-Arrival**

- Reported by flight crew or airline medical
- Assessment initiated while everyone still on plane
  - If Quarantine staff is not on site, assessment with CBP/EMS obtained via phone
- Most often illness is not of public health importance
- Allows identification of potential contacts, distribution of travel health alert notices (THANs) and/or passenger locator forms (PLFs)

## **Air Travel Illness Reported at Time of Arrival**

- Usually reported by Customs and Border Protection (CBP), emergency responders, other airport partners
- If Quarantine staff is not on site, assessment is with CBP / EMS via phone
- Most often illness is not of public health importance
- If traveler notification is indicated, requires obtaining passenger manifest

## Illness Reported Post-Arrival

- Usually reported by state or local public health, or international partners days to weeks after flight
- Are of public health importance
- Most common illnesses reported
  - **TB**, measles, mumps, rubella, pertussis, meningococcal disease
- If traveler notification is indicated, requires obtaining passenger manifest

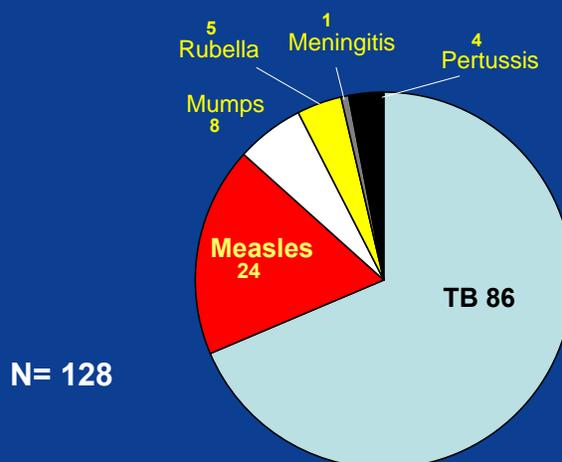
## Contact Investigations for Flights

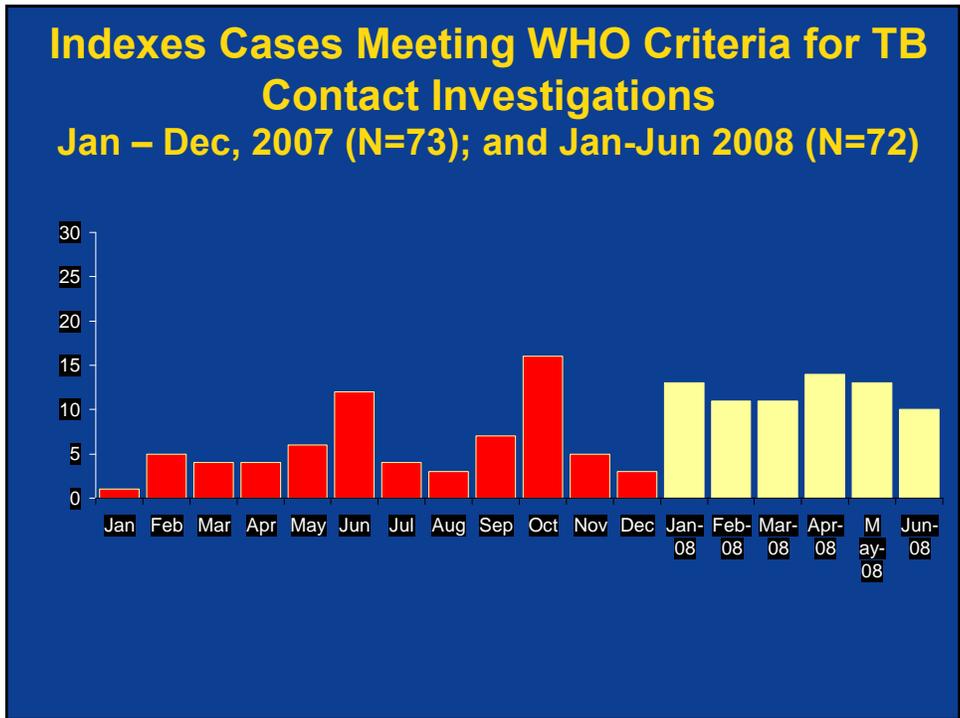
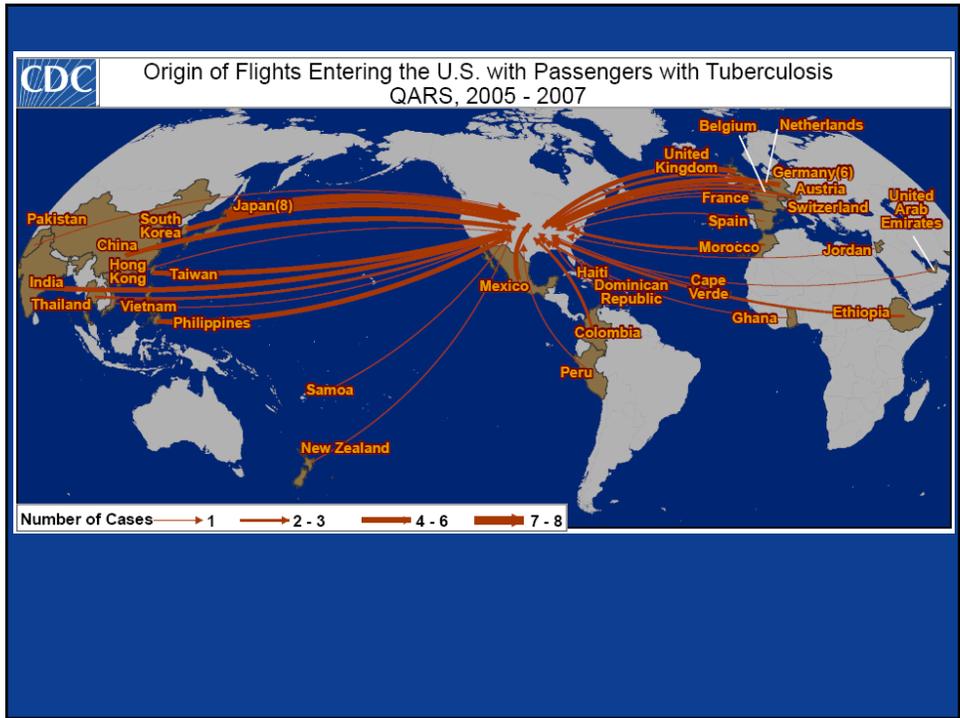
- CDC
  - Ascertain case meets criteria for being infectious during the flight
  - Obtain passenger contact information
    - Airline manifest
    - CBP
  - Provide information to state and foreign public health authorities
- Local and foreign public health authorities
  - Locate and evaluate passenger contacts
  - Report results to CDC (voluntary)

## Post-Arrival Contact Investigations Air Travel, 2007

- 119 index case patients
- 128 flights
  - International inbound
  - International outbound
  - Interstate
- 2,718 passenger contacts

## Contact Investigations Conducted for Illness Reported After Travel, 2007





## TB Passenger Contacts 2007 (N=2419)

Characteristic	Passive n=2297 (%)	Active n=122 (%)	Total N=2419 (%)
No Locator information	530 (23)	18 (15)	548 (23)
Locator information	1767 (77)	104 (85)	1871 (77)
Any outcome reported	527 (30)	103 (99)	630(34)
No outcome reported	1249 (70)	1 (1)	1241 (66)
TB evaluations reported	311 (18)	63 (61)	374 (20)
No TB evaluation reported	1456 (82)	41 (39)	1497 (80)

## Contact Investigations Challenges

- **Passenger locator data**
  - Passenger manifest from airline often missing, incomplete or inaccurate
  - Supplement with CBP data, but still incomplete/inaccurate
  - Data cleaning is labor intensive
- **Obtaining contact tracing outcomes**
  - Voluntary reporting by states
  - Data reported not standardized
  - Little to no results reported from foreign public health authorities

## **Journey of US Citizen with Multi-Drug Resistant TB May 12-31, 2007**



## **Tools for Restricting Travel on Commercial Air for Public Health Reasons\***

- Standardized protocol between CDC (DHHS) Department of Homeland Security (DHS)
- Tools
  - Border Lookout
  - Public Health Do Not Board
- Considerations
  - Supplement state and local authority
  - Balance the public good with restrictions on the individual
- So far used only for infectious TB

\* Federal authority to prevent air travel (Aviation and Transportation Security Act (49 U.S.C. 114))

## **Public Health 'Do Not Board' Tool**

- **CDC officially requests travel restrictions from DHS after careful review of the situation with health department officials to ensure the person meets criteria**
- **Will prevent an individual from boarding a plane inbound, outbound, or within the U.S.**
- **Reviewed at least every 30 days to evaluate whether removal of restriction is indicated**
  - **Removal takes no more than 24 hours**
  - **No residual adverse effect on patient**

## **'Do Not Board' Criteria**

- **Person is infectious or likely to become infectious with a communicable disease that would constitute a public health threat**
- **Substantiated concerns about noncompliance or unable to locate patient**
- **Reason to believe the individual will attempt to fly by commercial air**

## Disclaimer

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.



## Contacting Us...

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### Quarantine Stations

[www.cdc.gov/ncidod/dq](http://www.cdc.gov/ncidod/dq) (Home page)  
[www.cdc.gov/ncidod/dq/quarantine\\_stations.htm](http://www.cdc.gov/ncidod/dq/quarantine_stations.htm)

CDC Emergency Operations Center  
770-488-7100





## TB Test Results (N=341)

Characteristic	Passive n=286	Active n=55	Total N=341
Negative <sup>∞</sup> (TST <sup>§</sup> <5mm or QFT-G)	216 (75)	41 (75)	257 (75)
<b>Positive (TST ≥5mm or QFT-G<sup>**</sup>)</b>	<b>70 (24)</b>	<b>14 (25)</b>	<b>84 (25)</b>
Risk factors reported	51 (73)	11 (79)	62 (74)
NO risk factors reported	12 (17)	0 (-)	12 (14)
Risk factors not reported	7 (10)	3 21	10 (12)

<sup>∞</sup> Tested ≥8 weeks after flight

<sup>§</sup>TST=Tuberculin skin test

<sup>\*\*</sup>QFT-G=QuantiFERON-Gold®