Overview

- Refugee background
  - Review definitions
  - The numbers: US and NH data
- Overseas TB screening
  - Current algorithm
  - How effective?
- Remember the context

Quick review of definitions

- **Immigrant**: A non-US citizen who enters US with intention to remain
- **Refugee**: A non-US citizen who cannot return to their country of origin because of well-founded fear of persecution due to race, religion, nationality, social group or political opinion, as determined by DOS or INS
  - Receives this status PRIOR to entering the US
- **Asylee**: An immigrant who leaves their country for above reasons
  - Requests status change UPON or AFTER entering the US
- Both refugees & asylees are eligible to apply for lawful permanent resident status after 1 year in US

Refugee Health Screening: Overseas

- Before depart for US: mandatory medical exam for all refugees
- CDC (DGMQ) oversight
  - Determines requirements & technical guidelines
- Exams by ~650 panel physicians selected by DOS & CDC
- Purpose: to identify applicants with inadmissible health-related conditions (all treatable)
  - Communicable disease of public health significance
  - Lack certain vaccinations
  - Physical/mental disorder with harmful behavior
  - Substance abuse

Overseas Medical Exam

- Communicable diseases of public health significance:
  - Screening and/or Treatment for
    - Tuberculosis
    - Intestinal parasites
    - Malaria
    - Vaccine Preventable Diseases
    - Not HIV
  - Performed within 3 weeks of departure

Overseas TB Screening: 1991 TB algorithm

- Inactive TB (class B2 TB) → Chest radiograph → No TB
- Active TB
  - AFB smears (3)
  - Smear-positive TB (class A TB)
  - Smear-negative TB (class B1 TB)
  - No TB
  - All neg. (At least one pos.)

TB rates & case burden among refugees

- Hadzibegovic et al, Int J TB & Lung Dis, 2005
- Estimated case rate for TB among refugees in DeKalb County, GA, 1997-99
- TB rate: 83/100,000 in refugees vs. 12/100,000 for US-born (7x)
- TB risk 2x higher among refugees compared to other non-US-born
- Still high rates despite overseas screening, therefore, important to carefully screen in US

TB Classifications

- None = No TB
- Class A = active TB disease (departure delayed for Rx)
- Class B – follow up in US
  - H&P and/or CXR suggestive of PTB but have negative smears & cultures, not diagnosed with TB and can wait for further evaluation in US
  - Diagnosed and completed TB treatment under DOT
  - Extrapulmonary TB
- Class B2 – LTBI
  - TST or IGRA+ with neg eval for TB disease
- Class B3 = contact
Tuberculosis Treatment

- Applicants with pulm or laryngeal TB must complete treatment under DOT prior to US immigration
- Applicants with possible TB who are smear & culture negative are not treated overseas unless their CXR & clinical findings are highly suggestive of TB
- Treatment is according to ATS/CDC/IDSA guidelines using only quality-assured drugs
- Contact investigations are performed
  - Contacts evaluated & treated as needed

Travel Clearance Validity: TB evaluation

- If no TB classification or only classified as LTBI (B2) or a contact (B3) and no HIV:
  - Travel clearance is valid for 6 months from the time the evaluation is complete
- Otherwise travel clearance valid for 3 months

Comparison of 2007 with 1991 guidelines

<table>
<thead>
<tr>
<th>Category</th>
<th>1991</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability of laboratory screening</td>
<td>2 months of contact by Class B1 or Class B2 or Class B3, inclusive</td>
<td>6 weeks of contact by Class B1 or B2, inclusive</td>
</tr>
<tr>
<td>CXR</td>
<td>&gt;15 yrs, prior TB, TST ≥3mm (x yrs)</td>
<td>&gt;15 yrs, prior TB, TST &gt;5mm (x yrs)</td>
</tr>
<tr>
<td>TST</td>
<td>All TB contacts are required to be tuberculin-negative, not applicable</td>
<td>All TB contacts are required to be tuberculin-negative, to be administered in culture-negative cases (x yrs)</td>
</tr>
</tbody>
</table>

Longitudinal management prior to laboratory results | Not applicable | Not applicable |

Management of patients with positive TST | Not applicable | Not applicable |

Laboratory monitoring during tuberculosis treatment | Not applicable | Not applicable |

Management of known TB contacts | Not applicable | Not applicable |

Comparison of 2007 with 1991 guidelines

- Management of patients with positive TST: Applicants with positive TST results must be evaluated with a chest X-ray, physical examination, and sputum smear microscopy or AFB culture to rule out TB infection. Any positive smear or culture results must be confirmed by a second specimen. If the smear or culture is negative, the evaluation must be repeated every 6 months until a positive result is obtained. If the TST remains positive, a second TST must be performed at 12 months.
- Laboratory monitoring during tuberculosis treatment: All TB contacts are required to be tuberculin-negative, to be administered in culture-negative cases (x yrs). If the TST is positive, the contact must be evaluated with a chest X-ray, physical examination, and AFB smear microscopy or culture to rule out TB infection. Any positive smear or culture results must be confirmed by a second specimen. If the smear or culture is negative, the evaluation must be repeated every 6 months until a positive result is obtained. If the TST remains positive, a second TST must be performed at 12 months.
- Management of known TB contacts: Applicants with a positive TST result and a positive chest X-ray, physical examination, and AFB smear microscopy or culture are required to be evaluated with a chest X-ray, physical examination, and AFB smear microscopy or culture to rule out TB infection. Any positive smear or culture results must be confirmed by a second specimen. If the smear or culture is negative, the evaluation must be repeated every 6 months until a positive result is obtained. If the TST remains positive, a second TST must be performed at 12 months.

Did new algorithm result in better case finding?

- Before new algorithm (2002 to 2006):
  - 1,504 TB cases reported annually in US among non-US-born persons within 1 year of arrival (constant x yrs)
  - During & after implementation (2007 to 2012):
    - Annual TB cases decreased to 940
    - Annual smear-neg & culture-pos TB cases diagnosed overseas increased (in 2007 to 629 in 2012)
- Limitation: did not control for the decline in new arrivals of nonimmigrant visitors or decreases of TB in their countries of origin
- CONCLUDE: Implementation of the culture-based algorithm in US-bound immigrants & refugees may have substantially reduced the incidence of TB in this population

TB Overseas Screening

- Refugee adults currently only screened for TB disease, not TB infection (TBI)
- Should they be?
How much would it cost? Effective?

- Wingate et al estimated the costs of LTBI screening & treatment in refugees prior to arrival
  - Included costs of foreign & domestic LTBI screening & Rx & domestic TB disease treatment
- Hypothetical 1-year cohort of 100,000 refugees arriving in US from 3 LTBI prevalence levels
  - High (55% TST+)
  - Moderate (35%+)
  - Low (20%+)
- Overseas screening could prevent 440, 220 & 57 TB cases
- Net-cost savings: $4.9 million (high prevalence), $1.6 million (moderate) & $780,000 (low)

Are refugees screened for HIV?

- Previously: all refugees ≥ age 15 underwent mandatory HIV testing
  - If HIV+, had to apply for waiver to enter US
- Pres. Obama lifted HIV travel restrictions, as of Jan 2010:
  - Now:
    - Applicants do not have to be tested for HIV
    - Applicants who want HIV testing, do not have to be tested by a panel physician
    - If tested by a panel physician, results are included in their paperwork

Refugee Initial Medical Assessment in US

- All should have comprehensive medical screening within 90 days of arriving in the US
  - History & exam (incl vision, dental, hearing assessment)
  - Immunization review & update
  - Lead screening for age < 18
  - TB screening
  - STI screening
  - Hep B screening and vaccination
  - Malaria screening
  - Intestinal parasite screening

In refugee care: Remember the context…

- Refugees often have fled their country of origin
  - Many suffered /witnessed terrible atrocities & abuses
  - Some come from settings where government was the perpetrator
  - May not trust local authorities including health dept
  - Stigma of TB severe everywhere

NH TB Data – TB Cases in non-US-born

- Tuberculosis Cases by County and Country of Origin, 2011-2015
- Number of TB Cases by Age at Diagnosis and Country of Origin, 2011-2015

Stigma & hysteria fueled

- Vermont admits seventeen refugees diagnosed with active TB
- Clinton cash
Voices of Reason

- In response on VPR:

"It’s not a concern of mine as the state epidemiologist. We will continue to see refugees with latent TB infection and we will continue to see, in rare cases, active TB illness in refugees – like we do all the time in U.S.-born Vermonters.”

- Patsy Kelso, VT
- Health Department epidemiologist

Summary and Future Directions in Refugee Screening

- NH resettles 300-400 refugees each year
  - Many come from high TB burden countries
- Shift from domestic to more pre-departure TB screening, treatment & prevention
  - Pre-departure TB screening is evidence-based, cost-effective
  - Resulting in fewer cases in immigrant & refugees
    - TB also in other groups of visitors
- Future plans to increase communication across systems (e.g. from overseas to post-arrival clinicians)
  - Adapting to population-specific guidelines
- Remember the context
- Be a voice of reason

Acknowledgements

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Non-US-TB cases among other groups of visitors

- ~163.5 million non-US-born persons admitted to US annually
- ~500,000 are immigrants & refugees who undergo overseas TB screening
- 2001-2008, 11,500 estimated TB incident cases
  - 41.6% (4,783) in immigrants & refugees
  - 36.6% (4,211) in students/exchange visitors & temporary workers
  - 13.8% (1,589) in tourists & business travelers
  - 7.3% (834) in Canadian & Mexican nonimmigrant visitors
- CONCLUDE: Newly arrived nonimmigrant visitors contribute substantially to the burden of non-US-born TB in the US

NOTE: 6 of the 8 study years were prior to new TB screening algorithm

Other international populations: Students

- Currently not screened
- Wingate et al estimated the costs, cases averted, and cost-effectiveness of screening & treating TB in US-bound students
- Overseas screening of Chinese & Indian students would prevent importation of 157 TB cases annually
  - ~$2.7 million in savings
- Combined perspective, screening for Chinese students >$2.8 million annually, for Indian students ≈ $440,000 annually
- Incremental cost for each TB case averted ≈ $22,187 for Chinese & $15,063, for Indian
- CONCLUDE: Screening & treating students from high TB burden countries would reduce the number of TB cases imported; could save the US millions of dollars annually; however costs to students

Plos One, 2015