Tuberculosis in Children: U.S. Experience After Immigration

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Disclosures

Dr. Starke has no conflicts of interest.

This presentation will not include discussion of pharmaceuticals or devices hat have not been approved by the FDA.

I will not be discussing unapproved or “off-label” uses of pharmaceuticals or devices.

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Objectives

At the conclusion of this webcast, the participant will be able to:

1. Explain to the children and families they evaluate for tuberculosis during the immigration process what will happen after arrival in the United States
2. Educate their clients about the U.S. public health system and how TB-related services can be accessed after arrival in the United States
3. Describe the similarities and differences between the procedures for and resources available to immigrants and refugees after arrival in the United States

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ESTIMATES OF CHILDHOOD TUBERCULOSIS

WHO, 2013: 530,000 annual cases, 74,000 deaths in non-HIV-infected children [no estimate for HIV-infected]

- Actual notifications to WHO were 301,233

Jenkins *et al* 2014: Modeling study estimate – 999,792 cases

Dodd *et al* 2014: Modeling study estimates in 22 high burden countries: 650,977 cases; 7,591,759 children annually infected; 53,234,854 total infected children

WHO, 2020: 1.2 million annual cases; 230,000 deaths

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Tuberculosis Mortality in Children

Dodd et al. *Lancet Glob Health* 2017; 5:e898.

- 239,000 annual deaths in children < 15 years of age
- 80% of the deaths are in children < 5 years of age
- More than 70% of the deaths occur in Africa and Asia
- 39,000 deaths in children with HIV co-infection [31,000 in Africa]
- **More than 96% of the deaths occurred in children NOT RECEIVING TREATMENT**

Conclusion: TB is a top 10 cause of death in children worldwide and a key omission from previous analyses of under-5 mortality

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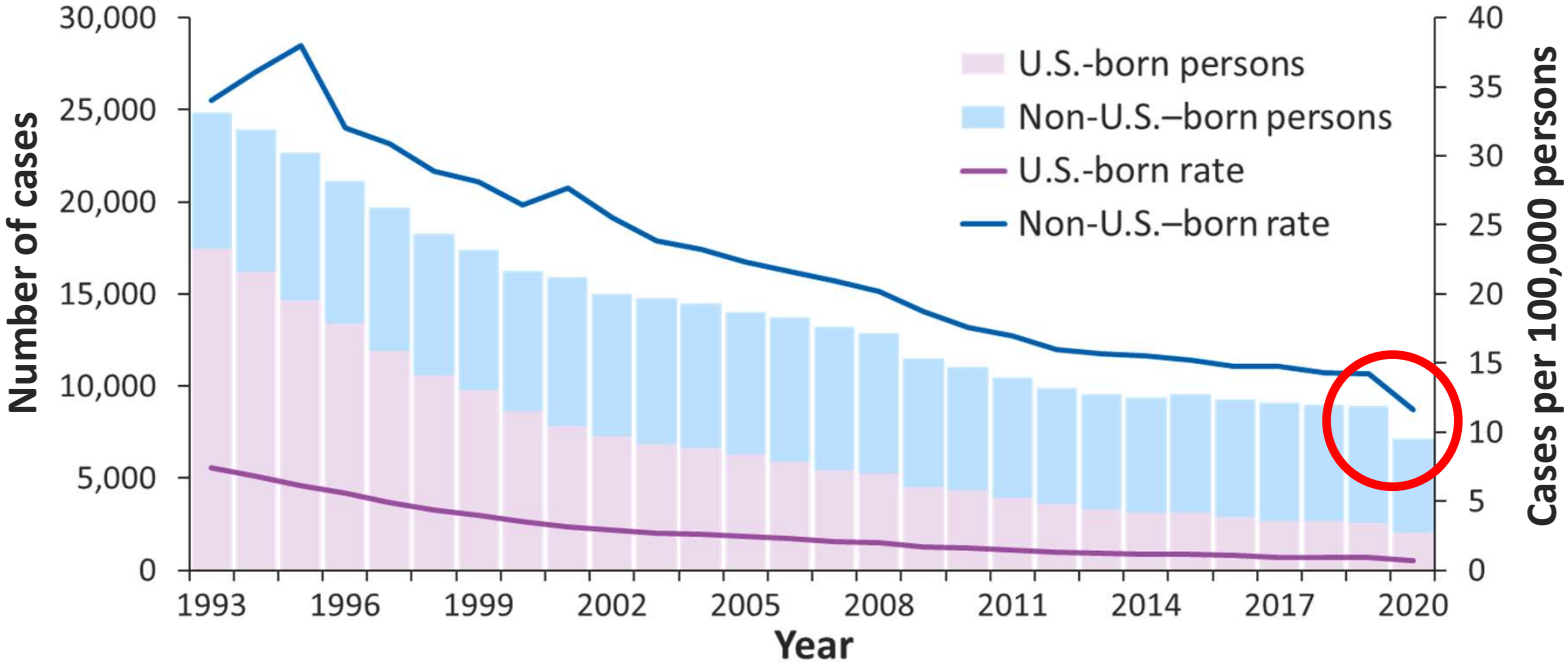
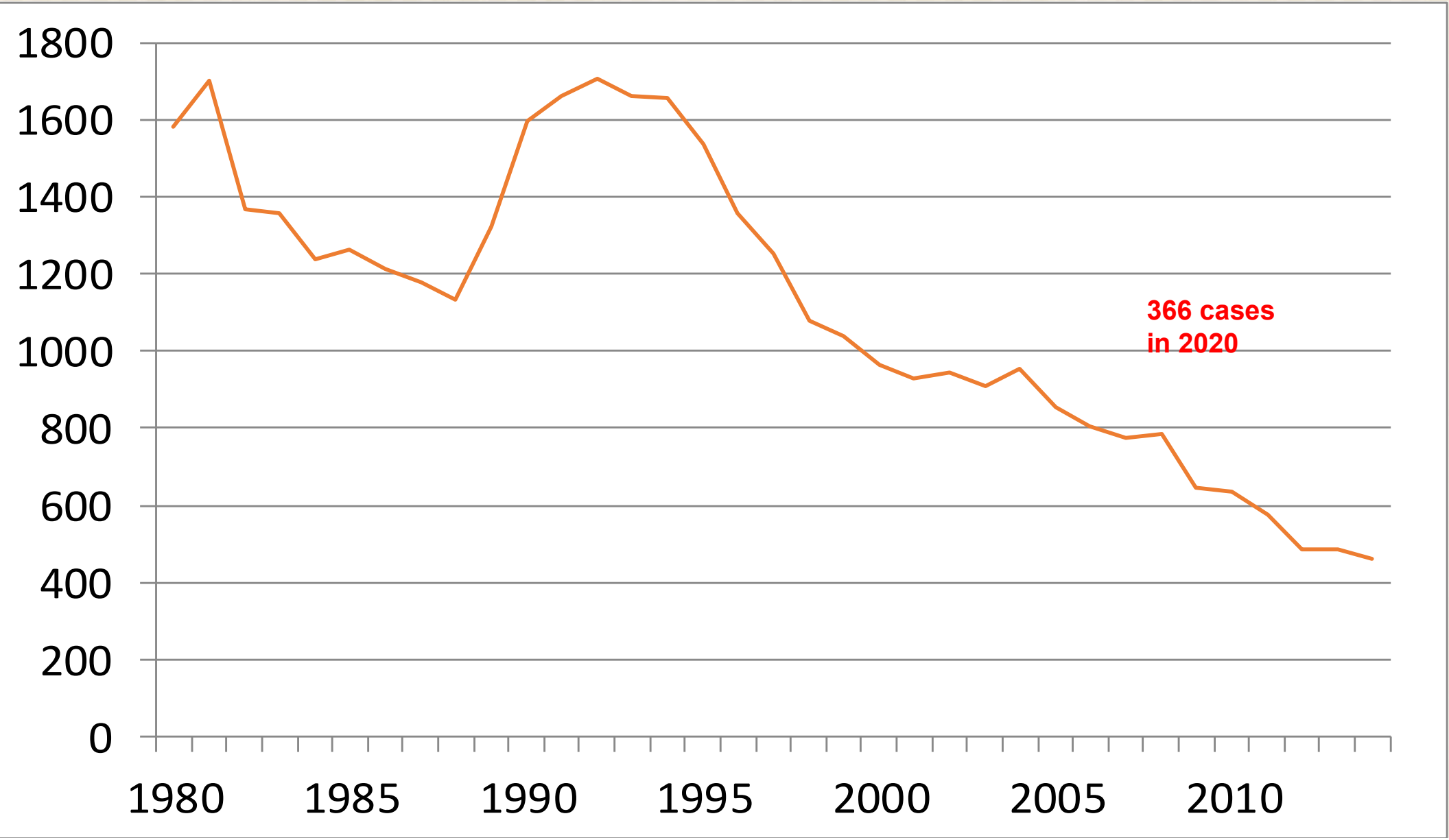
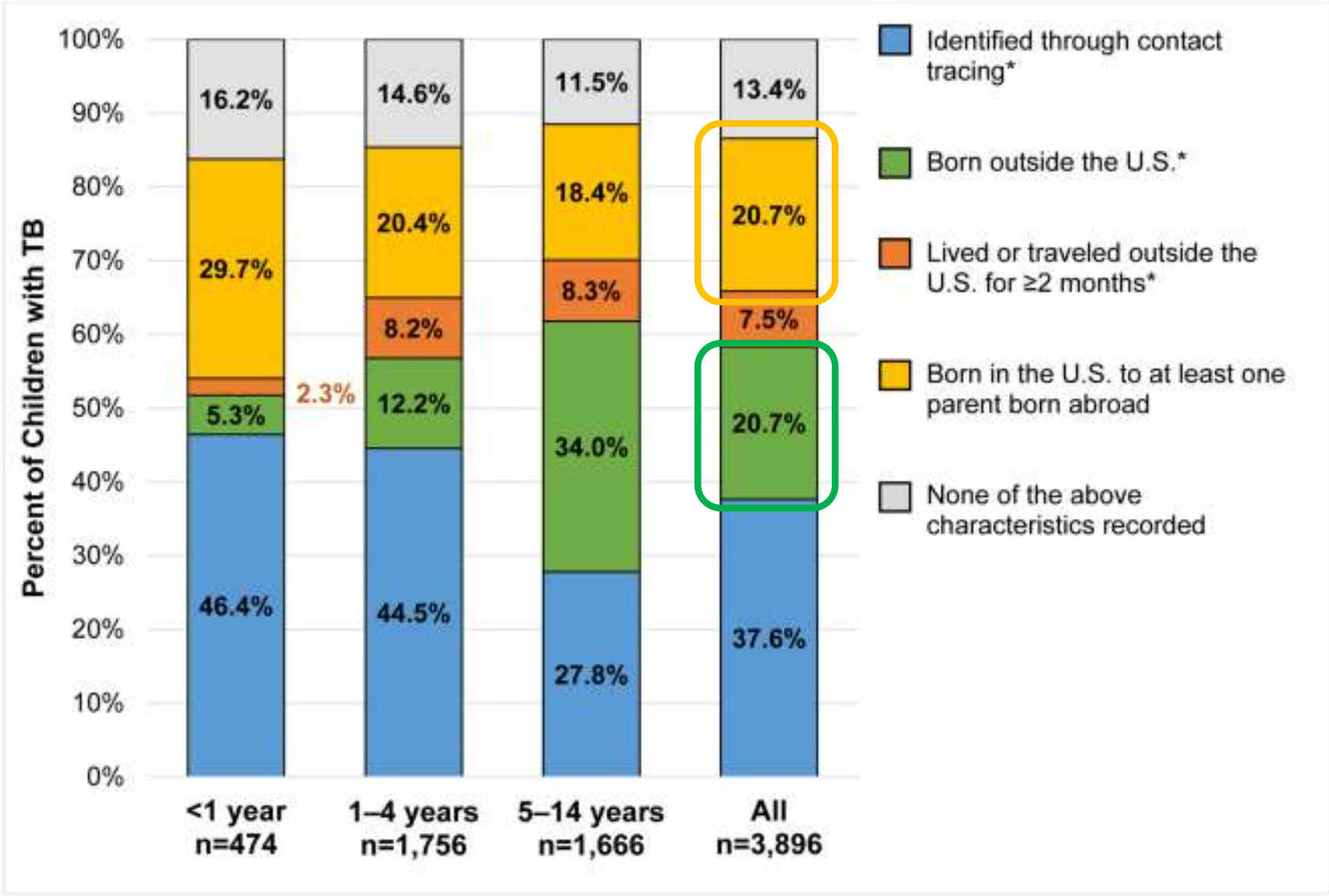
TB Cases and Incidence Rates by Origin of Birth, United States, 1993–2020



Tuberculosis Cases in Children 0-14 Years of Age, 1980-2016 – United States



Cowager et al. Epidemiology of tuberculosis (TB) among children and adolescents in the United States, 2007–2017: an analysis of national surveillance data. Lancet Public Health. 2019 October; 4(10): e506–e516. doi:10.1016/S2468-2667(19)30134-3.



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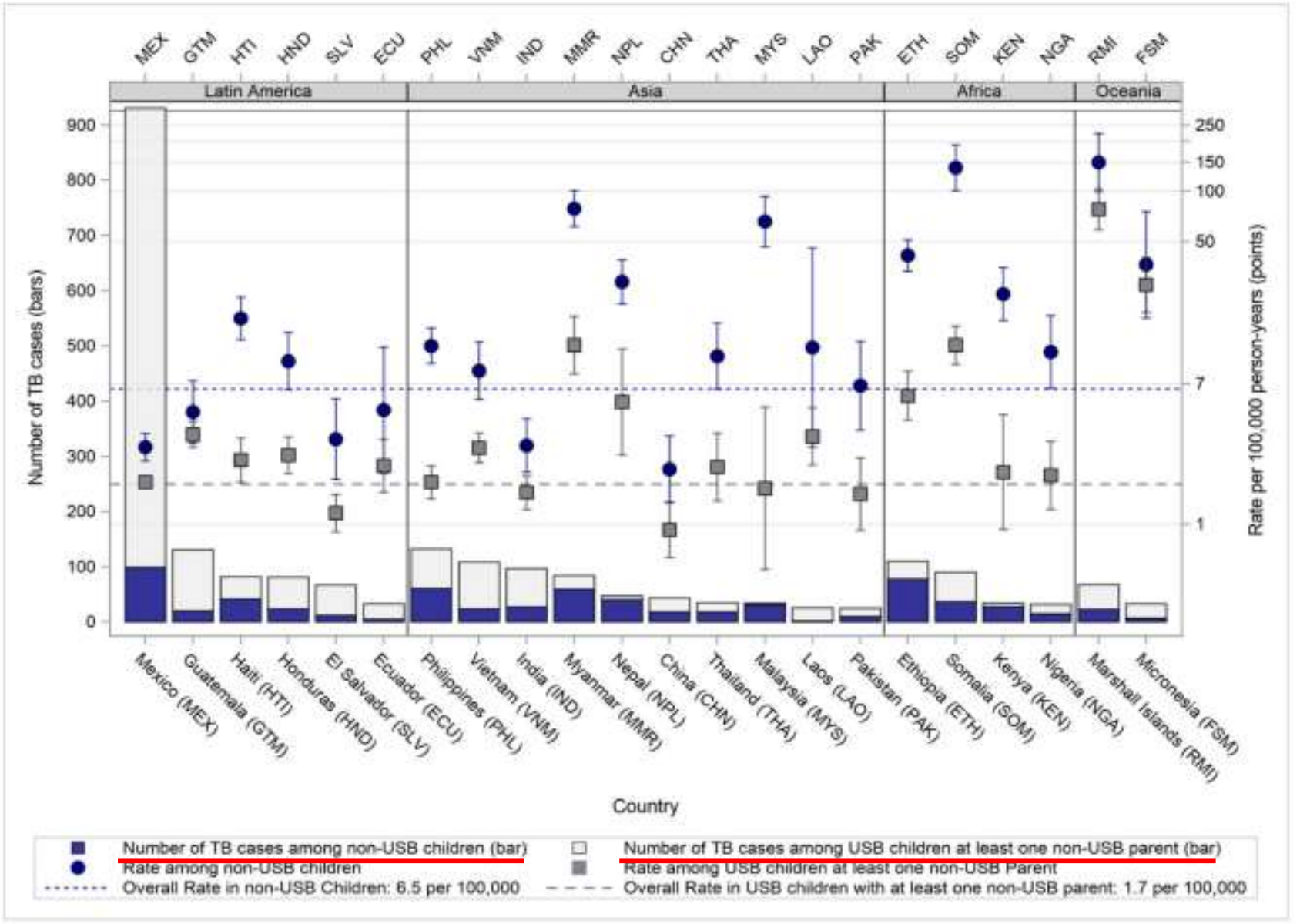
Cowager et al. Epidemiology of tuberculosis (TB) among children and adolescents in the United States, 2007–2017: an analysis of national surveillance data. Lancet Public Health. 2019 October; 4(10): e506–e516. doi:10.1016/S2468-2667(19)30134-3.



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How Have We Lowered Childhood TB Rates in the U.S.?

- Family-centered contact investigation
- Availability of the best available diagnostic modalities
- Screening and treating high risk children and adolescents
- Adequate funding of TB control programs

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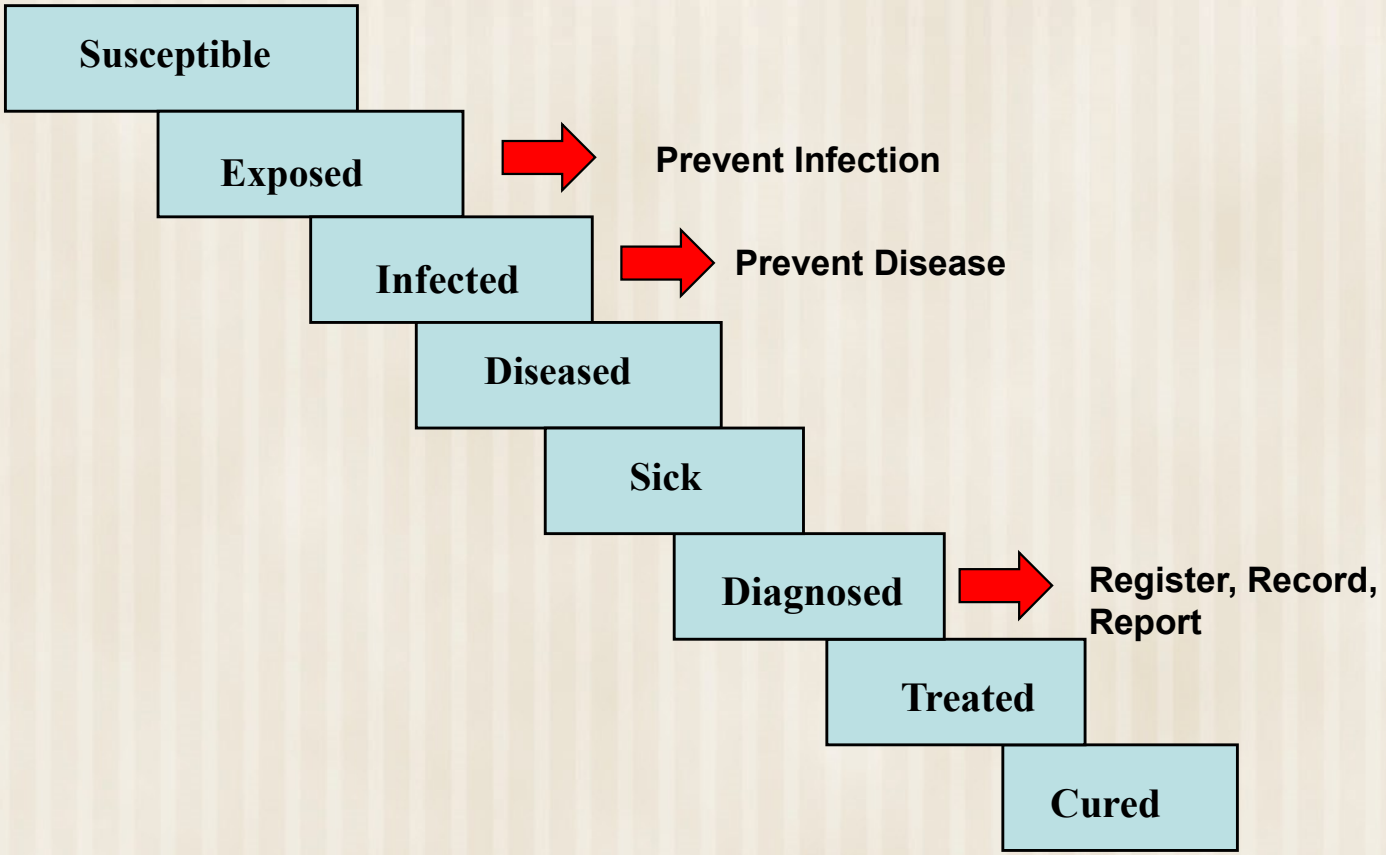
TRANSITIONS IN TUBERCULOSIS



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Stout et al. Thorax, 2018 Jul 7. pii: thoraxjnl-2018-211715. doi: 10.1136/thoraxjnl-2018-211715. [Epub ahead of print]

- Prospective cohort study
- Enrolled from populations at high risk of TBI
- Each enrollee tested for TBI with 3 FDA-approved tests:
  - QuantiFERON (QFT) blood test
  - T-SPOT.TB (T-SPOT) blood test
  - Tuberculin skin test (TST)

Used latent class analysis (LCA) to estimate the "true" prevalence of TBI in our study population, as well as test sensitivities and specificities

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Test Characteristics by LCA for Foreign-Born Participants >5 years (n=8,018)

LTBI prevalence	37.9% (32.6-42.9)		
Sensitivity		**PPV**	
TST	74.8% (67.2-82.4)	TST	60.0% (56.4-62.7)
QFT	71.6% (63.3-79.9)	QFT	97.6% (94.0-99.6)
T-SPOT*	70.3% (61.4-79.1)	T-SPOT*	98.6% (95.8-99.8)
Specificity		**NPV**	
TST	69.6% (67.7-71.4)	TST	81.8% (78.5-91.1)
QFT	98.9% (97.8-99.9)	QFT	85.0% (73.8-89.3)
T-SPOT*	99.4% (98.6-100)	T-SPOT*	84.5% (77.8-91.0)

PPV = positive predictive value, true positive /true positive + false positive;
NPV= negative predictive value, true negative/true negative + false negative

* For LCA we used ≥5 spots as a positive T-SPOT result

LTBI Test Characteristics by LCA for Foreign-Born Children <5 Years (n=463)

LTBI prevalence	4.2% (1.9-6.7)		
Sensitivity		**PPV***	
TST	74.8% (67.2-82.4)	TST	10.2% (5.0-16.9)
QFT	70.4% (54.4-86.1)	QFT	73.8% (43.3-95.5)
T-SPOT*	58.9% (42.5-75.7)	T-SPOT	71.9% (45.4-93.2)
Specificity		**NPV***	
TST	74.0% (69.7-78.0)	TST	98.3% (96.7-99.3)
QFT	98.9% (97.7-99.9)	QFT	98.7% (97.3-99.6)
T-SPOT**	99.0% (98.1-99.9)	T-SPOT	98.2% (96.5-99.4)

PPV = positive predictive value, true positive /true positive + false positive;
NPV= negative predictive value, true negative/true negative + false negative

** For LCA we used ≥5 spots as a positive T-SPOT result

Summary

Foreign-born persons ≥5 years

- ***TST was little better than a coin flip*** in predicting who had TBI
- Both the QFT and T.SPOT had high positive predictive values of 97.6 and 98.6

Foreign-born persons <5 years

- LTBI prevalence by LCA was 4%
- For TST ≥ 10 mm as positive, the PPV was 10%; ***almost all positive TST results were false positives***
- The data support recommendations preferring either serial testing (TST followed by a QFT/T-SPOT) or use QFT/T-SPOT as the initial screening test in foreign-born persons < 5 years

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Which Test Should be Used for Childhood Immigrants and Refugees?

Lowenthal et al. *Pediatr Infect Dis J* 2016; 35:231.

- Retrospective analysis of 12,544 immigrant children 2-14 years of age who arrived in California with a TB classification in 2008-13

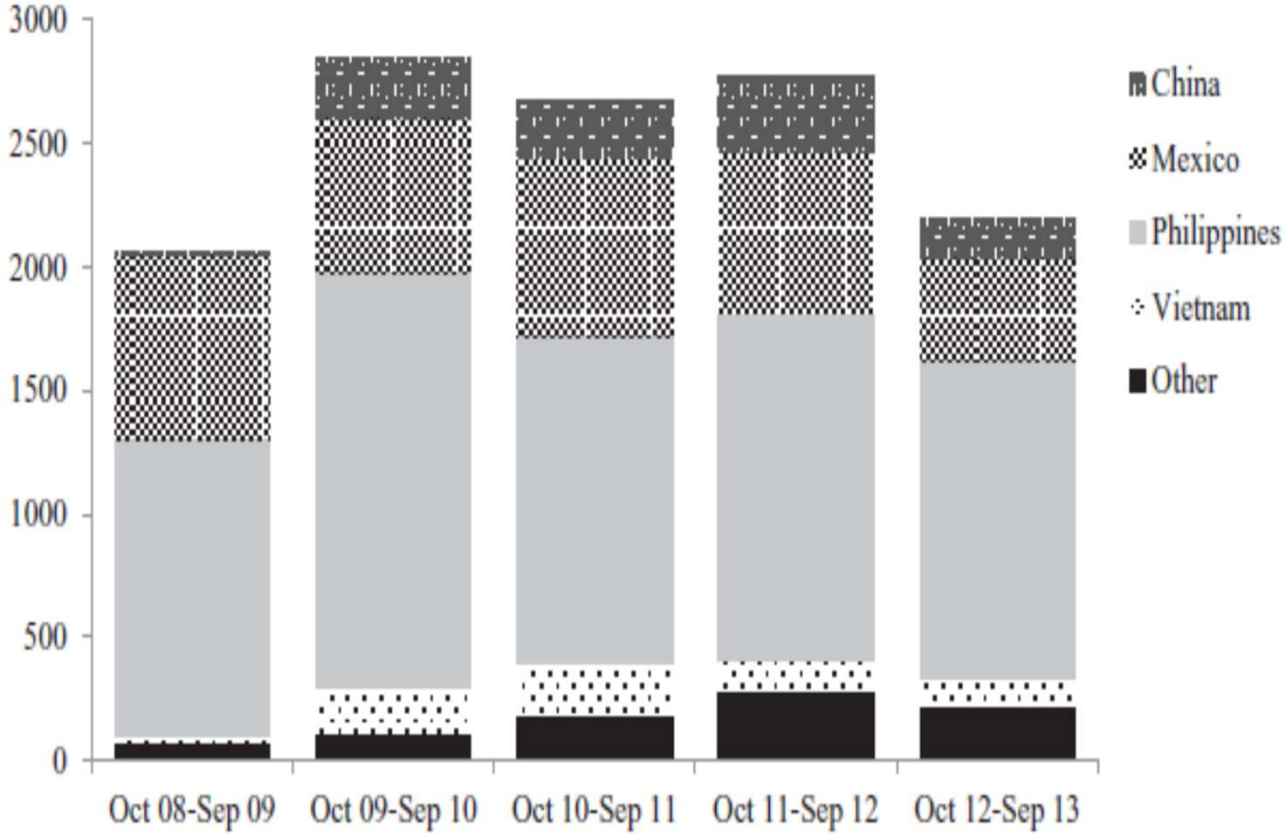

FIGURE 2. Immigrant arrivers with positive TST on preimmigration screening by country of origin and date of US entry, California, October 2008–September 2013.

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Which Test Should be Used for Childhood Immigrants and Refugees?

TABLE 3. Domestic IGRA-positive Result by Country of Origin and Age Among Immigrant Arrivers with Positive TST on Preimmigration screening, California, October 2008–September 2013

Country of Origin	Immigrant Children (2–14 Yr Old)	Domestic IGRA Done, N (%)	IGRA Positive, N (%)	Percent IGRA Positive by Age (Yr)			Trend *P* Value
				2–4	5–9	10–14	
China	423	264 (62)	17 (6)	0 (0)	2 (3)	15 (9)	0.05
Mexico	1655	805 (49)	390 (48)	16 (19)	102 (41)	272 (60)	<0.0001
Philippines	4676	2347 (50)	364 (16)	21 (9)	97 (12)	246 (20)	<0.0001
Vietnam	539	382 (71)	86 (23)	5 (24)	25 (23)	56 (23)	0.99
Other	445	216 (49)	57 (26)	0 (0)	20 (29)	37 (30)	0.03
Total	7738	4014 (52)	914 (23)	42 (11)	246 (19)	626 (28)	<0.0001

TABLE 4. Domestic IGRA-positive Result by preimmigration TST Result Among Immigrant Arrivers with Domestic TB Evaluation, California, October 2008–September 2013

Preimmigration TST Result (mm)	Immigrant Arrivers Evaluated	Domestic IGRA Done, N (%)	IGRA Positive, N (%)	Trend *P* Value
10–14	4902	2623 (54)	450 (17)	<0.0001
15–19	1926	973 (51)	302 (31)	
≥20	687	321 (47)	142 (44)	
Missing	271	118 (44)	20 (17)	
Total	7786	4035 (52)	914 (23)	

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Ahmed et al. *Pediatrics* 2020 Jan;145(1):e20191930. doi: 10.1542/peds.2019-1930.

- Large study of almost 3,600 children, mostly immigrating from foreign countries where BCG vaccines are given routinely
- Overall agreement between IGRAs and the TST was 80%
- Children < 2 years old had the highest rate of TST+/IGRA- discordance [likely BCG effect]
- **Of 533 TST+/IGRA- children < 5 years old, including 54 < 2 years old, who were untreated none developed TB disease in a 2-year follow up**

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Table 1. Definitions of immigration classifications, United States

Immigration classification	Definition
Refugee	A person located outside the United States who demonstrates he or she was persecuted or has a fear of persecution because of race, religion, nationality, political opinion, or membership in a particular social group and is not firmly resettled in another country (*18*).
Asylee (asylum seeker)	Any person who meets the definition of a refugee and is already in the United States or seeking admission at a port of entry (*19*).
Parolee (Cuban and Haitian Family Reunification Parole Programs)	Persons from Cuba and Haiti who have family members who are US citizens or lawful permanent residents, who are able to come to the United States without waiting for immigrant visas to become available (*20*).
Special immigrant visa (holders	There are many categories; however, the children included in this study are children of Iraqi and Afghan translators who are interpreters who have worked with the US Armed Forces or under the chief of mission authority at the US embassy in Baghdad or Kabul (*21*).
Victim of human trafficking	A person who has been recruited, harbored, or transported for compelled labor or commercial sex acts through the use of force, fraud, or coercion (*22*).

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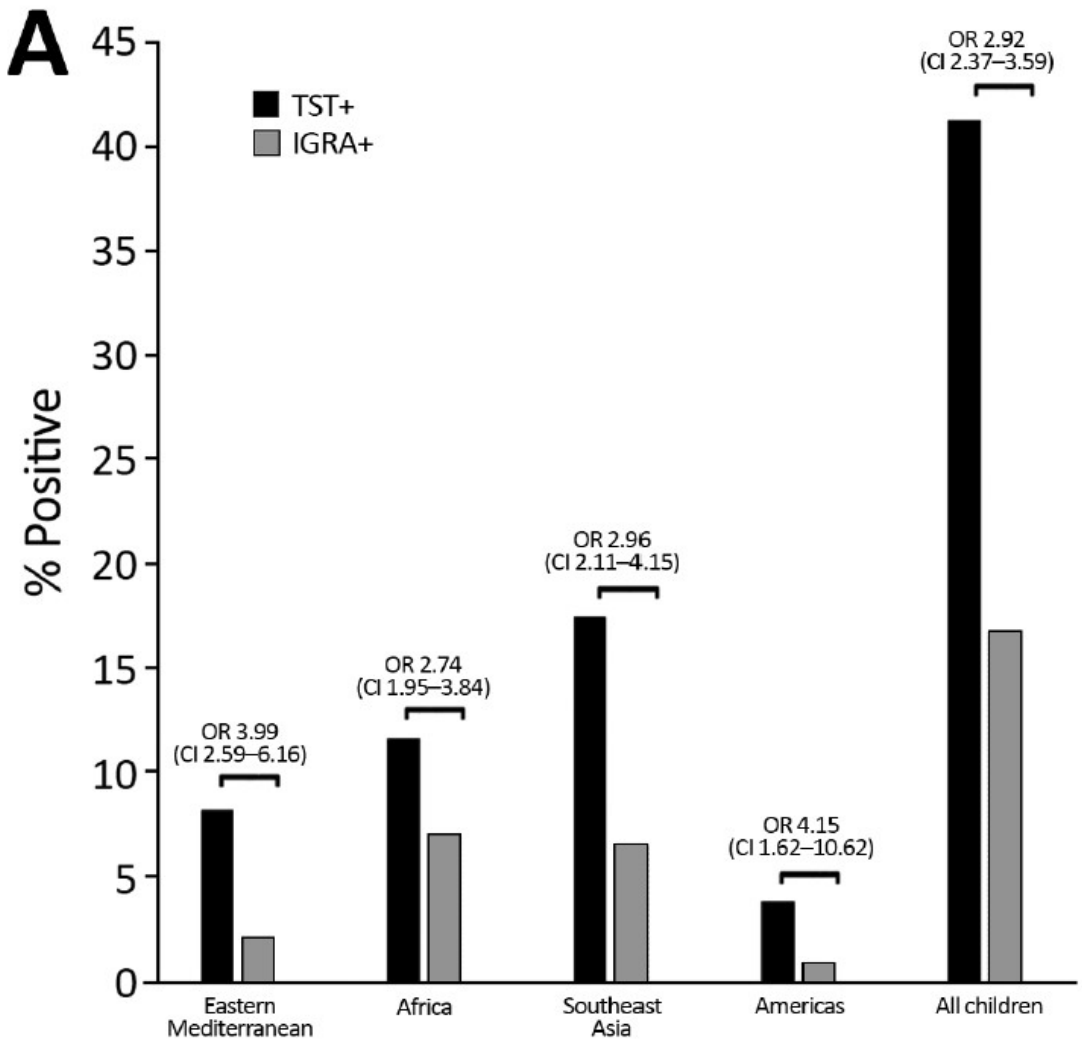
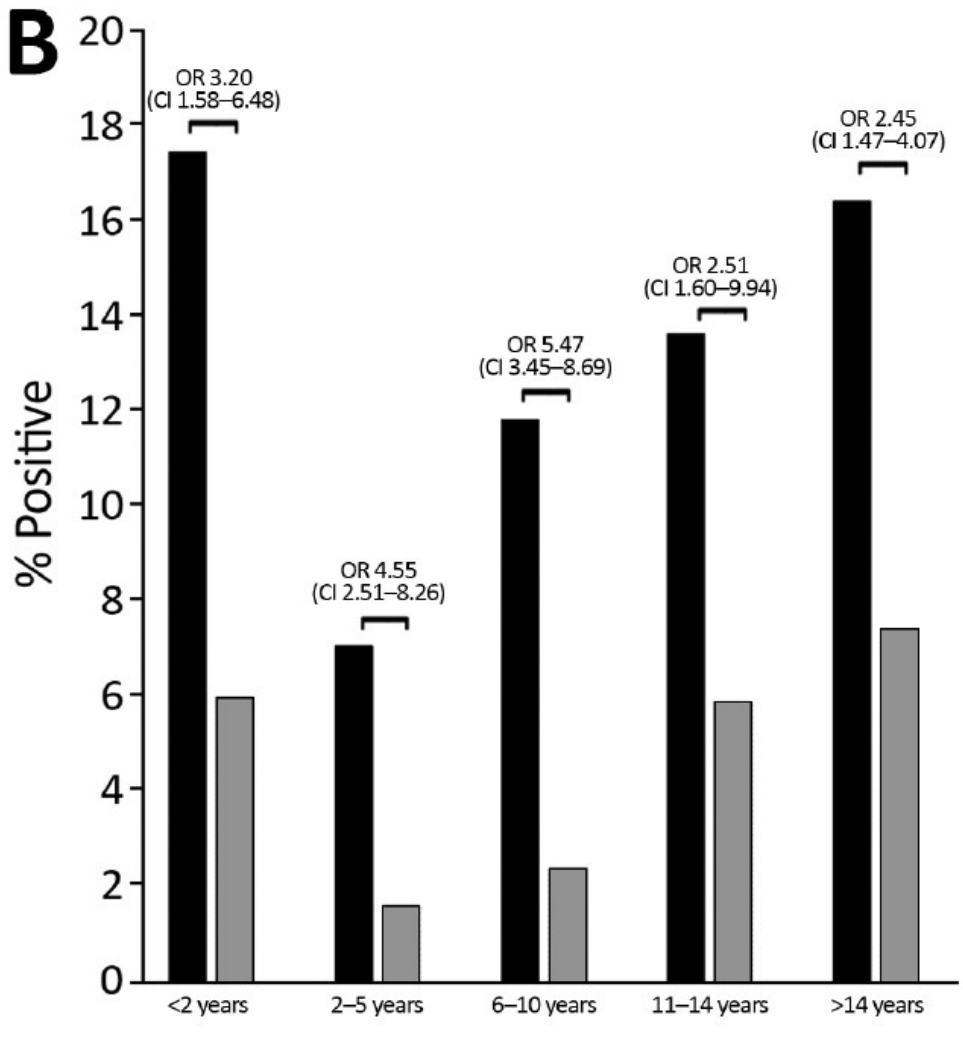
Lamb, et al. Tuberculosis in Internationally Displaced Children Resettling in Harris County, Texas, USA, 2010–2015. *Emerg Infect Dis* 2020; 8:1686-1694.





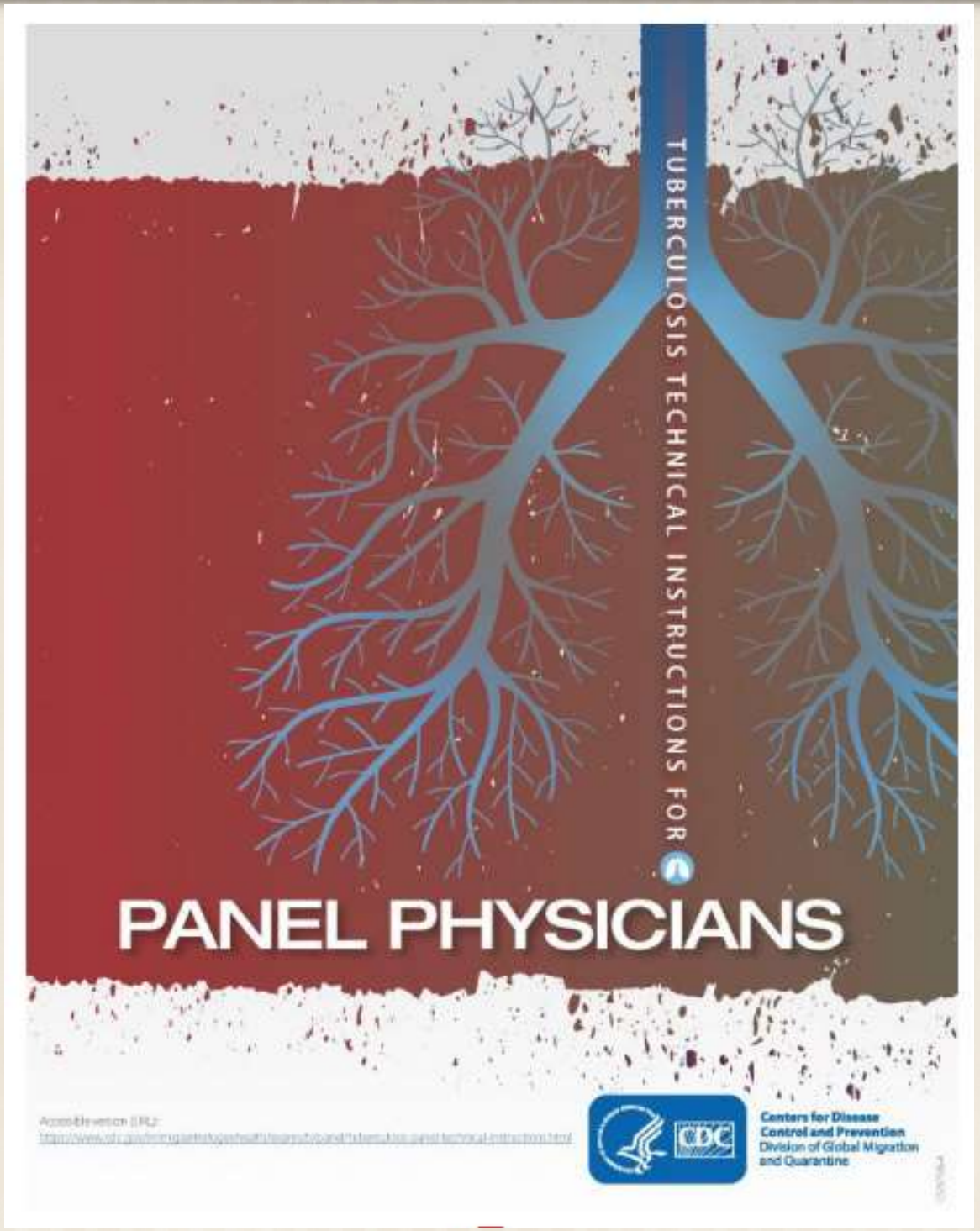


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Figure1a: Tuberculosis screening for applicants 2 - 14 years of age in low TB burden countries*

For all applicants 2 through 14 years of age in low tuberculosis burden countries
- Medical history
- Physical examination

For those with signs or symptoms of tuberculosis or known HIV infection
- IGRA
- Chest x-ray
- Three sputum smears and three cultures for *M. tuberculosis*

For those with positive cultures
- Drug susceptibility testing

Figure1b: Tuberculosis screening for applicants 15 years of age or older in low TB burden countries*

For all applicants ≥15 years of age in low tuberculosis burden countries
- Medical history
- Physical examination
- Chest x-ray

For those with a chest x-ray suggestive of tuberculosis, or signs or symptoms of tuberculosis, or known HIV infection
- Three sputum smears and three cultures for *M. tuberculosis*

For those with positive cultures
- Drug susceptibility testing

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Figure 2a: Tuberculosis screening for applicants 2 - 14 years of age in high TB burden countries*

For all applicants 2 through 14 years of age in high tuberculosis burden countries
- Medical history
- Physical examination
- IGRA

For those with a positive IGRA or signs or symptoms of tuberculosis or known HIV infection
- Chest x-ray

For those with a chest x-ray suggestive of tuberculosis, or signs or symptoms of tuberculosis, or known HIV infection
- Three sputum smears and three cultures for *M. tuberculosis*

For those with positive cultures
- Drug susceptibility testing

Figure 2b: Tuberculosis screening for applicants 15 years of age or older in high TB burden countries*

For all applicants ≥ 15 years of age in high tuberculosis burden countries
- Medical history
- Physical examination
- Chest x-ray

For those with a chest x-ray suggestive of tuberculosis, or signs or symptoms of tuberculosis, or known HIV infection
- Three sputum smears and three cultures for *M. tuberculosis*

For those with positive cultures
- Drug susceptibility testing

*Tuberculosis screening for applicants ≥ 15 years of age in countries with a WHO-estimated tuberculosis disease incidence rate ≥20 cases per 100,000 population.

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Medical History and Physical Exam

- We rarely see these
- Often many months between the exam and immigration
- Usually a delay of weeks to many months before they are seen by a U.S. physician
- Immigrants are free to move within the U.S. so information often does not get to the physician or clinic who is seeing the child
- Not done for children < 2 years of age

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IGRA Testing

- We sometimes get actual values, but often get "positive" or "negative"
- Indeterminate/invalid results do not have to be repeated in country of origin – as if the child were never tested

When we see low-level positive results and the only indication for testing is foreign birth, we do a second test and act on those results, per ATS/CDC/IDSA guidelines

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False-Positive IGRA Results

- False positive results are not caused by previous BCG vaccination or exposure to most NTM
- However, low level [<1.00 QFT, < 8 spot T-SPOT] false positives are common, caused by nonspecific reactivity
- Low-level conversions [- to +] and reversions [+ to -] occur frequently among healthcare workers in serial testing
- ATS/CDC/IDSA guidelines: if a patient has an unexpected low level positive, either repeat the same test or do a different test and act on the second result

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Chest Radiography

- We do not get the actual films, just a report that usually says only, “Abnormal”
- Radiographs are often taken many months before immigration – disease can develop in the interim: “No TB” valid for 6 months
- Even experts in childhood tuberculosis can disagree on interpretation

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Palmer et al. the diagnostic accuracy of chest radiographic features for pediatric intrathoracic tuberculosis. Clin Infect Dis 2022; 75:1014-1021.

Table 5. Multivariate Analysis Using Logistical Regression to Identify Which Chest Radiograph Features Are Associated With Having Confirmed Intrathoracic Tuberculosis

	Unadjusted OR	95% CI	Adjusted OR	95% CI
Enlarged perihilar lymph nodes	15.85	9.31–24.49	6.62	3.80–11.72
Enlarged paratracheal lymph nodes	15.76	8.19–33.48	5.14	2.25–12.58
Bronchial compression/ deviation	23.09	11.88–50.56	6.22	2.70–15.69
Alveolar opacification	1.83	1.34–2.50	1.16	0.76–1.77
Cavity	6.54	3.39–13.44	7.45	3.38–17.45
Pleural effusion	2.28	1.17–4.05	2.27	1.04–4.78
Expansile pneumonia	9.09	2.85–40.18	4.16	0.93–22.34

This analysis was restricted to CR reads from children with confirmed and unlikely TB.

Abbreviations: CI, confidence interval; CR, chest radiograph; OR, odds ratio; TB, tuberculosis.

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Microbiology

- At best, we can microbiologically confirm TB disease in children only 30% to 40% of the time; higher for infants, toddlers and adolescents
- Induced sputum can be obtained in most children but it is difficult in younger children
- Gastric aspirate yields are often < 10% in clinically confirmed pediatric cases in high burden countries

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***Therefore, the vast majority of children with TB disease found during immigration evaluation will have B1 TB, Pulmonary status, and go untreated in country.

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Class A TB Disease – applicants who have TB disease:

- All applicants who have microbiologically-confirmed pulmonary TB disease or extrapulmonary disease with a radiograph suggestive of pulmonary TB
- Required treatment completion before travel
- Mostly adolescents in the pediatric population who will receive this classification

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Class B0 TB, Pulmonary

- Applicant who was diagnosed by the panel physician or presented to the panel physician while on treatment and successfully completed treatment under the supervision of the panel physician
- Travel clearance good for 3 months
- Very rare classification for children
- May be referred in the U.S. for verification of cure

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Class B1 TB, Pulmonary

- Applicants with signs or symptoms, physical exam or chest radiograph findings suggestive of TB disease but have negative sputum smears and cultures and are not diagnosed with TB disease
- **The majority of children with TB disease fit this description!**
- Travel clearance is valid for 3 months
- We receive almost no specific information about these children
- One country experience

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Class B1 TB, Pulmonary [cont.]

- Applicants 10 years of age or younger who require sputum cultures, regardless of HIV infection status, may travel to the United States immediately after sputum smear analysis results are reported as negative (while culture results are pending) if none of the following three conditions exist:

1. Chest radiograph findings include:
   - One or more cavities
   - Extensive disease (e.g., particularly if involving both upper lobes)
2. Respiratory symptoms include a forceful and productive cough
3. Known contact with a person with multidrug-resistant tuberculosis disease (MDR TB) who was infectious at the time of contact

For applicants 10 years of age or younger who travel to the United States while results of cultures are pending, the panel physicians must:

- Give the applicant a Class B1 TB, Pulmonary classification.
- Document on the Tuberculosis Worksheet (DS 3030) that culture results are pending.
- E-mail culture results to DGMQ at cdcQAP@cdc.gov so that DGMQ can send the culture results to the receiving US health departments.

CDC Tuberculosis Technical Instructions for Panel Physicians

Class B2 TB, LTBI Evaluation

- Applicants with a positive TST or IGRA result but an otherwise negative evaluation for TB disease
- "The IGRA result or size of the TST reaction the applicants' status with respect to LTBI treatment, and the medication(s) used must be documented"
- We get no information about possible exposure to drug-resistant TB
- Travel clearance is valid for 6 months
- The average time between initial TB infection and development of TB disease in a young child is 3-9 months

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Class B3 TB, Contact Evaluation

- "Recent" [undefined] contact of a known TB disease case, regardless of TST or IGRA results
- If the TST or IGRA is positive and there is no TB disease, the applicant will have both B2 and B3 classification
- The nature of the contact tracing required is not described
- We almost never see this classification
- I can't remember ever getting information about possible drug resistant TB infection

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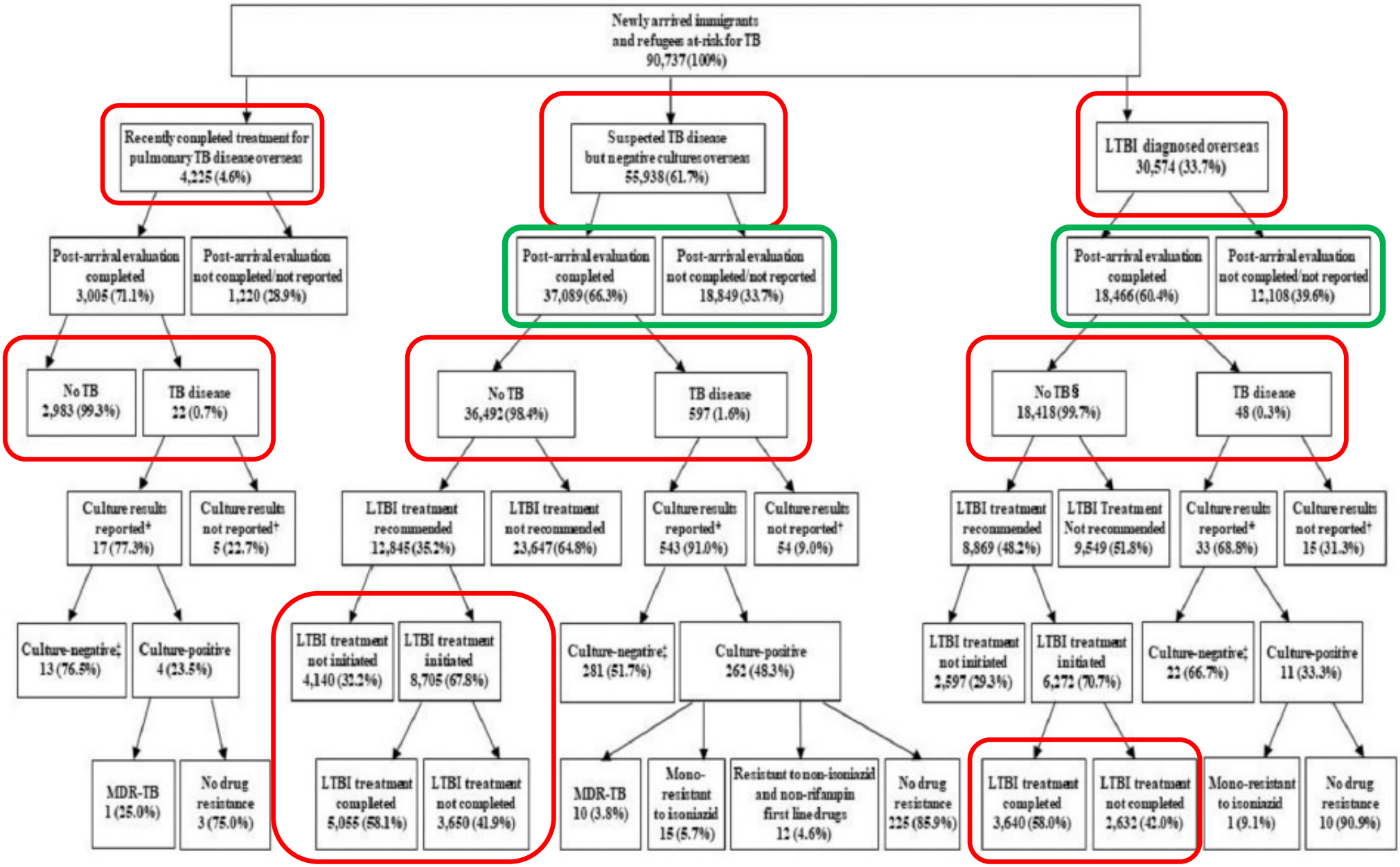
ClassB3 TB, Contact Evaluation

Situations in which preventive therapy should be initiated overseas include certain pediatric contacts (see information below) and contacts with impaired immunity (e.g., HIV infection).

- Children <4 years of age and applicants with impaired immunity (e.g., HIV infection) who are contacts of a known tuberculosis disease case, regardless of how that case was diagnosed, and who have a negative evaluation for tuberculosis disease, should begin directly observed preventive therapy (DOPT) regardless of IGRA results. Isoniazid may be used except in known exposures to a tuberculosis disease case with MDR TB or isoniazid resistance. Advice on other preventive regimens should be sought from experts at a COE.
- Children and applicants with impaired immunity (e.g., HIV infection) receiving preventive therapy should have an IGRA 8 weeks after exposure to the infectious case ends. Preventive therapy may be discontinued if the IGRA is negative 8 weeks after exposure to the infectious case ends.
- Children and applicants with impaired immunity may be cleared for travel while on preventive therapy and should be assigned a tuberculosis classification (Class B3 TB, Contact Evaluation). If the applicant does not complete preventive therapy before departure, a 30-day supply of medication and instructions on how to take it should be given to the applicant or the parent or responsible adult traveling with the applicant.

Panel physicians do not need to wait to classify applicants who are a contact of someone suspected of having tuberculosis disease until the person they are a contact to has culture results returned. If someone leaves for the United States and you later learn that he or she is a contact of someone with a positive culture, please notify DGMQ (cdcQAP@cdc.gov), who will then notify the receiving health department.

Liu et al. Tuberculosis among Newly Arrived Immigrants and Refugees in the United States. *Ann Am Thorac Soc*. 2020 November ; 17(11): 1401–1412. doi:10.1513/AnnalsATS.201908-623OC.



Liu et al. Tuberculosis among Newly Arrived Immigrants and Refugees in the United States. *Ann Am Thorac Soc*. 2020 November ; 17(11): 1401–1412. doi:10.1513/AnnalsATS.201908-623OC.

- Of 277 sputum culture-positive TB cases, 11 (4.0%) had MDR-TB, 16 (5.8%) were mono-resistant to isoniazid, and 12 (4.3%) resistant to a non-isoniazid and non-rifampin first-line drug
- Persons with suspected TB disease but negative cultures overseas had a higher risk for sputum culture-positive TB than those with recent completion of treatment for pulmonary TB disease overseas (adjusted RR 6.6, 95% CI 2.4–17.9)
- Of 21,714 persons for whom LTBI treatment was recommended at post-arrival evaluation, 14,977 (69.0%) initiated treatment and 8,695 (40.0%) completed treatment
- Of those with LTBI diagnosed overseas by tuberculin skin test, less than a third (28.8%) were positive when retested by interferon-γ release assays at post-arrival evaluation.
- The analysis found that 35.5% of at risk immigrants and refugees did not complete follow-up evaluation in the United States.

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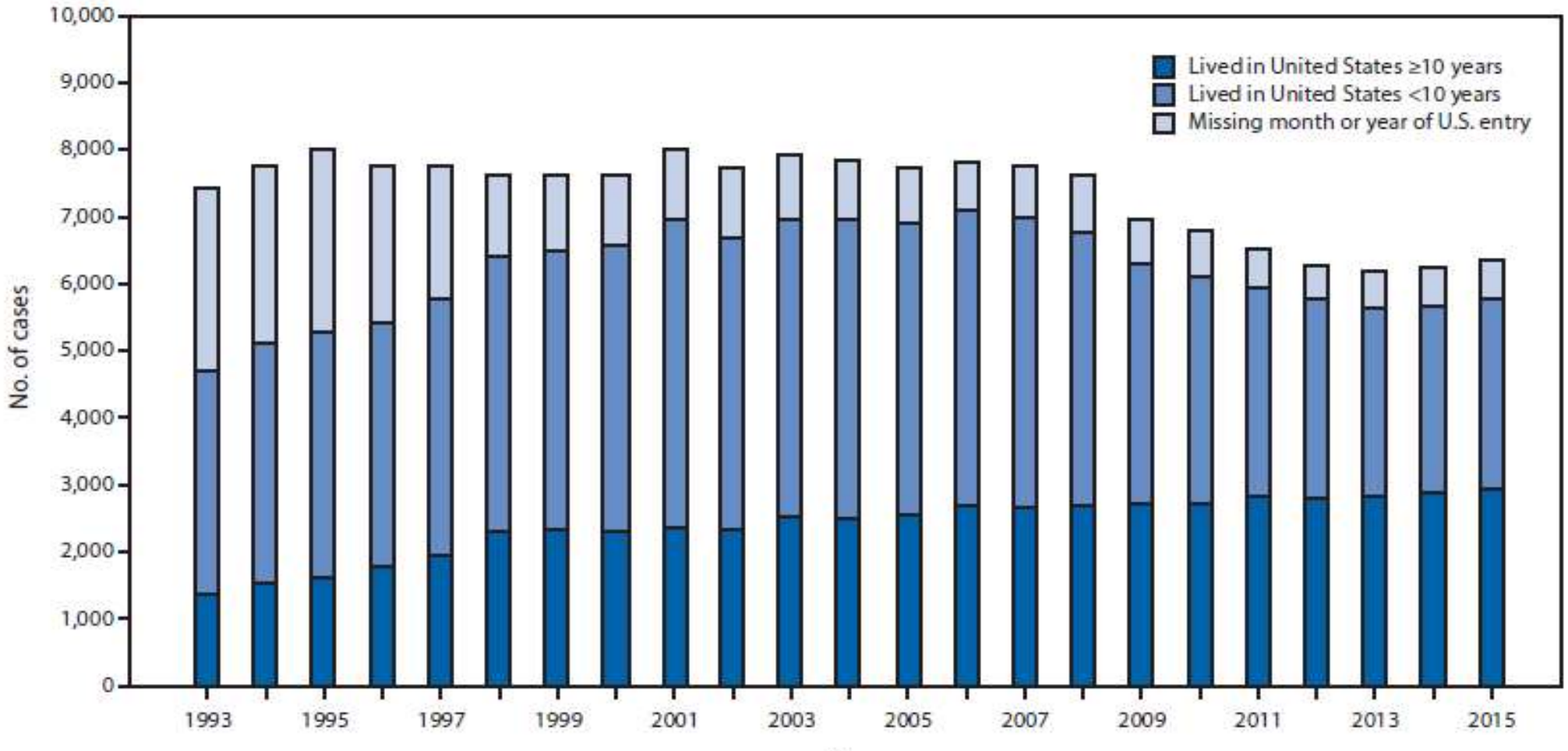
Tsang et al. Tuberculosis Among Foreign-Born Persons Diagnosed ≥10 Years After Arrival in the United States, 2010–2015. *MMWR* 2017; 295-298.

FIGURE. Number of tuberculosis cases diagnosed among foreign-born persons <10 years and ≥10 years after arrival in the United States, 1993–2015



Tsang et al. Tuberculosis Among Foreign-Born Persons Diagnosed ≥10 Years After Arrival in the United States, 2010–2015. *MMWR* 2017; 295-298.

"Whereas TB case rates among foreign-born persons are highest among those who have newly arrived in the United States, rates of TB diagnosed among foreign-born persons ≥10 years after arrival remain substantially higher than those among U.S.-born persons. Most TB in the United States is thought to be a consequence of infection acquired years in the past, and recent estimates are that 92.5% of TB among foreign born persons is caused by reactivation of LTBI. Therefore, most TB among foreign-born persons, even those who arrived ≥10 years ago, is probably attributable to infections acquired before U.S. arrival."

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Taylor et al. Latent Tuberculosis Infection among Immigrant and Refugee Children arriving in the United States—2010. *J Immigr Minor Health*. 2016 October; 18(5): 966–970. doi:10.1007/s10903-015-0273-2.

- Analyzed data from CDC's Electronic Disease Notification System (EDN) [a web-based system that provides state and local health departments with access to the pre-immigration medical exam results] to assess post-immigration evaluations and TB therapy for children who entered the United States after being diagnosed with LTBI during the pre-immigration medical examination
- The pre-immigration medical exam was required for all immigrants and refugees immigrating to the United States, but a post-immigration health assessment was only recommended
- About 70% of children who arrived in the United States with a diagnosis of LTBI had a post-immigration follow-up exam reported to CDC [so 30% did not]
- The proportion of missing data in EDN increased at each step of the post-immigration TB follow-up continuum,

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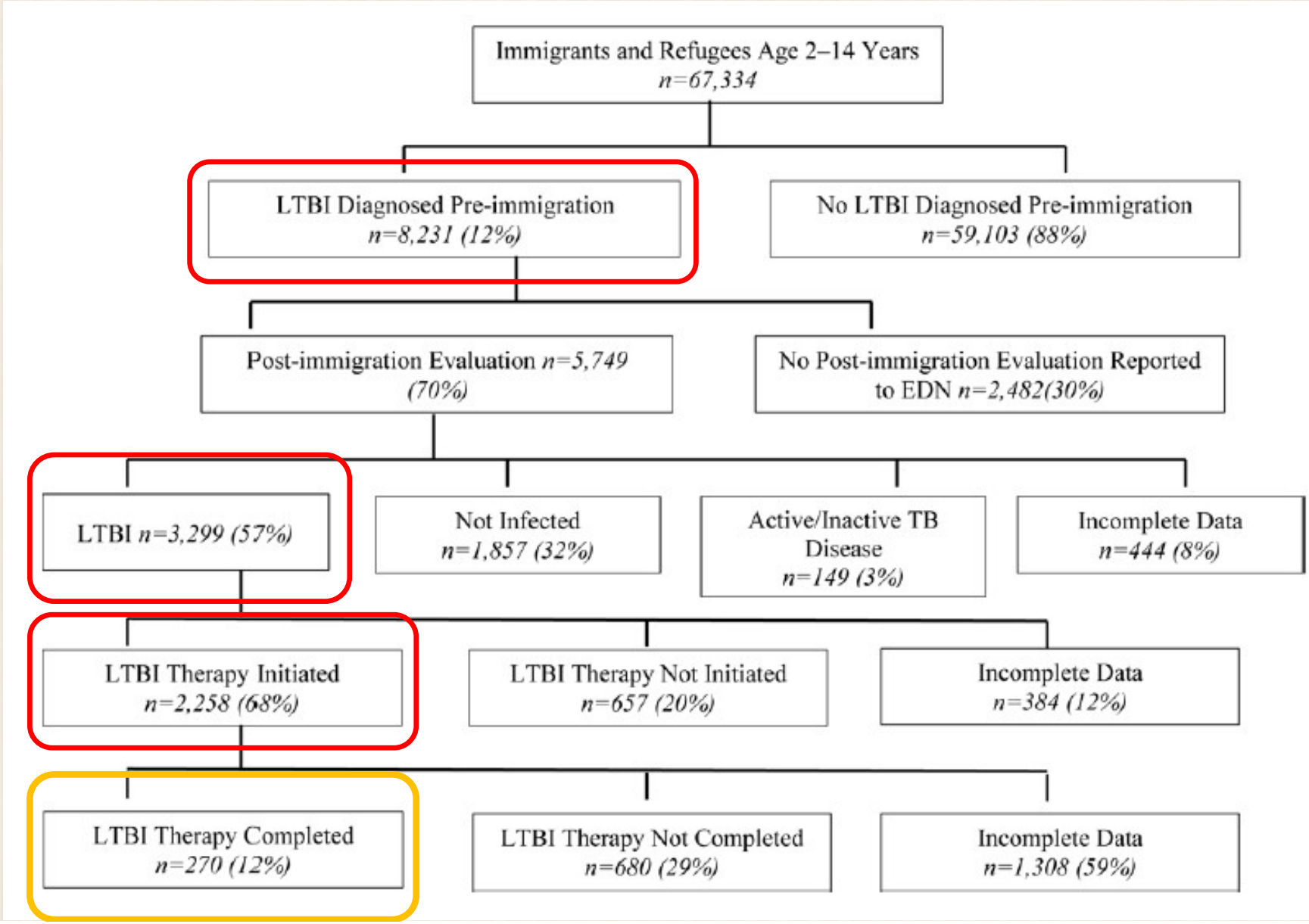
Taylor et al. Latent Tuberculosis Infection among Immigrant and Refugee Children arriving in the United States—2010. *J Immigr Minor Health*. 2016 October ; 18(5): 966–970. doi:10.1007/s10903-015-0273-2.



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Wang et al. US Post-arrival Evaluation of Immigrant and Refugee Children with Latent Tuberculosis Infection Diagnosed Overseas, 2007-2019. *J Pediatr* 2022; 245:149-157.

- Compared overseas and US interferon-γ release assay (IGRA)/tuberculin skin test (TST) results and LTBI diagnosis
- Assessed post-arrival LTBI treatment initiation and completion
- Evaluated the impact of switching from TST to IGRA to detect *Mycobacterium tuberculosis* infection overseas
- 73,014 children were diagnosed with LTBI overseas and arrived in the US during 2007-2019
- For 17,996 children with a positive overseas TST, 73.8% were negative when retested by IGRA
- For 1,051 children with a positive overseas IGRA, 58.0% were negative when retested by IGRA

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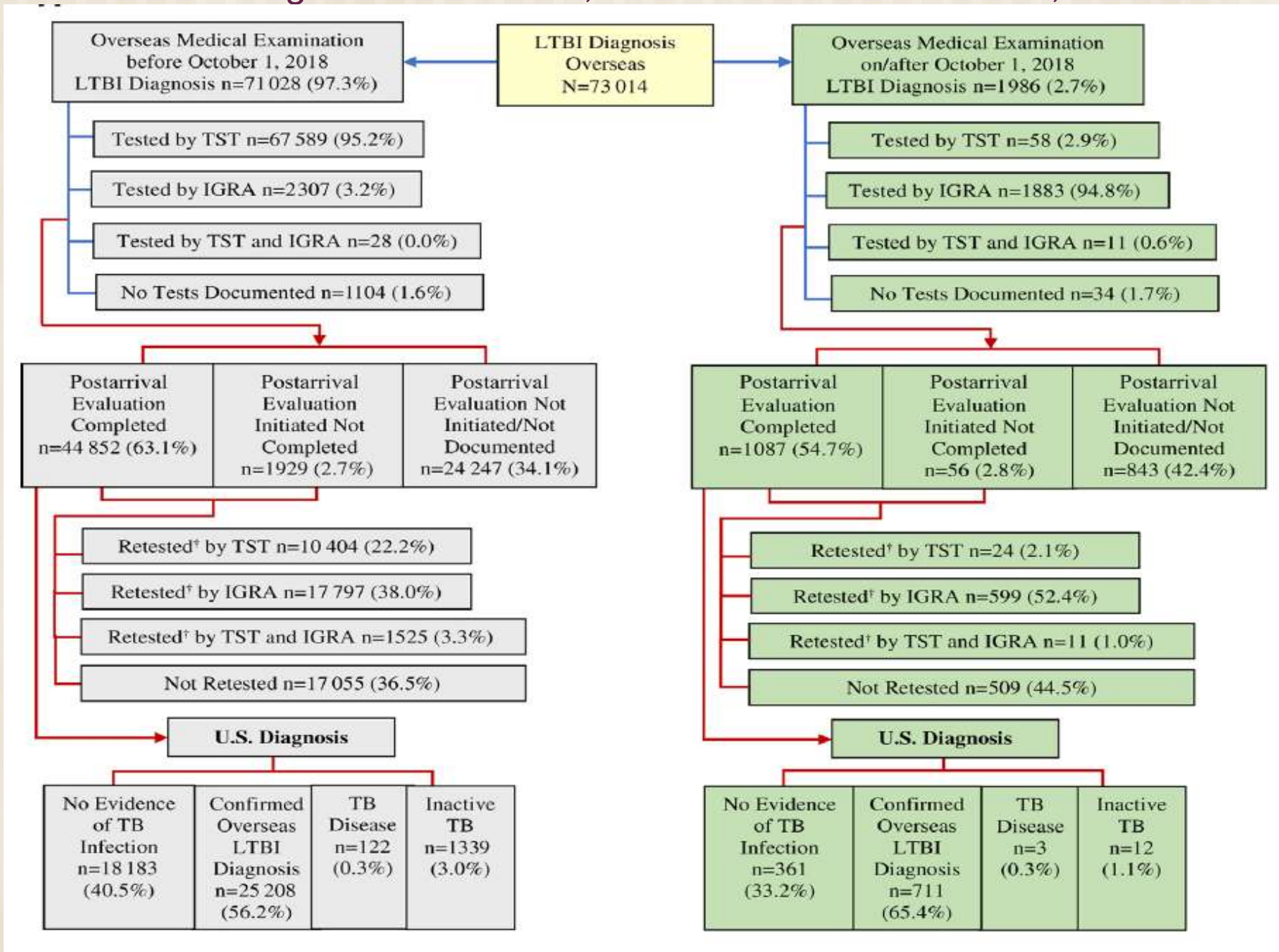

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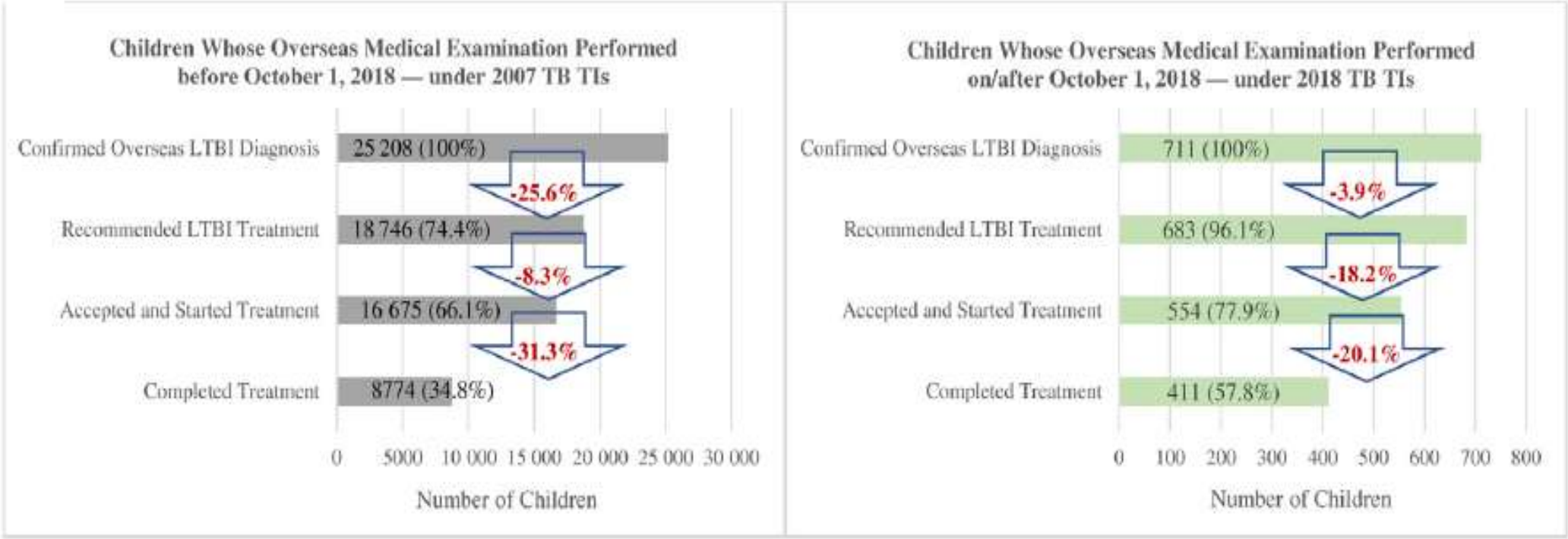
Wang et al. US Post-arrival Evaluation of Immigrant and Refugee Children with Latent Tuberculosis Infection Diagnosed Overseas, 2007-2019. *J Pediatr* 2022; 245:149-157.

Cascade of care for children aged 2-14 years whose overseas LTBI diagnosis was confirmed during their US post-arrival evaluation, 2007-2019.



Wang et al. US Post-arrival Evaluation of Immigrant and Refugee Children with Latent Tuberculosis Infection Diagnosed Overseas, 2007-2019. *J Pediatr* 2022; 245:149-157.

- Overall, among children who completed a post-arrival evaluation,18,544 (40.4%) were evaluated as having no evidence of TB infection, and 25,919 (56.4%) had their overseas LTBI diagnosis confirmed.
- Among the latter, 17,229 (66.5%) initiated and 9,185 (35.4%) completed LTBI treatment.
- Requiring IGRA testing overseas would more effectively identify children who will benefit from LTBI treatment. However, IGRA reversions may occur, highlighting the need for individualized assessment for risk of infection, progression, and poor outcome when making diagnostic and treatment decisions.
- Strategies are needed to increase the proportions receiving a post-arrival evaluation and completing LTBI treatment

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Accessing Health Care for Immigrant Children in the U.S.

Terms related to accessing health care

- Immigrant
- Undocumented immigrant
- Legal immigrant
- Qualified immigrant
- Lawfully present immigrant

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Accessing Health Care for Immigrant Children in the U.S.

- Extremely complicated!!!
- Varies to some degree by state because the programs called Medicaid and CHIP are state run with federal subsidies
- In all states, “lawfully present” immigrant children are eligible for Medicaid and CHIP but there may be a cost to the family
- Eligibility and amount of subsidies for family for the Affordable Care Act varies greatly by state
- Tuberculosis services also vary by state – some provided by health departments, others by private clinics or physicians
- **All federal, state, and local programs—regardless of the funding source—that provide emergency or crisis care, diagnosis or treatment of communicable disease, or immunization are open to non-U.S. citizens**

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Accessing Health Care for Immigrant Children in the U.S.

Some issues:

- Accessing care for TB exposure or infection is essentially voluntary
- Immigrants are free to move jurisdictions, and…
- The U.S. does not have a robust centralized TB information system about patients; this occurs mainly at the state and local levels
- Many smaller public health TB programs have limited access to translation services and do not have workers that represent a wide variety of cultures
- TB services may or may not be free of charge
- Fear of authority

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Why Fears of Immigration Consequences Cause Some to Avoid Health Care

Fear of being Labeled a "Public Charge"

Some immigrants fear that using publicly sponsored health care or subsidies will prevent them from getting legal status or citizenship. Federal policy in place since 1999 has tried to reassure non-citizens that use of health care by eligible people will not create barriers to immigration or citizenship, but confusion and fear remain among both undocumented and *lawfully present* immigrants.

The only way health care use can prevent a green card holder from becoming a citizen is if he or she committed fraud to get those benefits (for example, misrepresented his or her income, state residence or immigration status).

Sponsor "deeming" and liability

Many Lawful Permanent Residents (sometimes called "green card" holders) are sponsored by a relative or others who promise to provide for the new immigrant's needs. In some situations, the sponsor's income can be counted ("deemed") as if available to the sponsored person in determining eligibility for health care services. And though asking sponsors to repay the costs of care ("liability") provided to those they sponsor is almost unheard of, it is technically possible under the law in some cases and thus creates a barrier for some immigrants. Care for children in Texas CHIP or Medicaid is exempt from sponsor deeming and liability.

Reporting to the U.S. Citizenship & Immigration Services (USCIS, formerly INS)

Medicaid, CHIP, other health programs and health care providers are not required to report all undocumented persons to immigration authorities. Indeed the Department of Homeland Security has confirmed that it will not use information provided by health care applicants for immigration enforcement purposes. Reporting to USCIS can occur in cases of fraud, but is not done simply based on a household including a person with undocumented status. Still, immigration officials have on occasions been known to seek out immigrants in health care settings, which can create long-lasting fears spread by word of mouth, and make immigrants reluctant to get necessary care.

Khan et al. Overseas Treatment of Latent Tuberculosis Infection in US–Bound Immigrants. *Emerg Infect Dis* 2022; 28:582-590. DOI: https://doi.org/10.3201/eid2803.212131

- Study in Vietnam, ~1,500 applicants per month
- Assessed voluntary uptake of treatment of LTBI for applicants ≥ 12 years of age
- Subjects informed that if they tested positive by IGRA, they could get treated in the U.S. after arrival
- Test of infection was QuantiFERON Gold In tube and the test was offered for free
- Participants testing positive were classified as B2 TB
- Those testing positive were offered 3HP via DOT free of charge – minimum 8 week stay required

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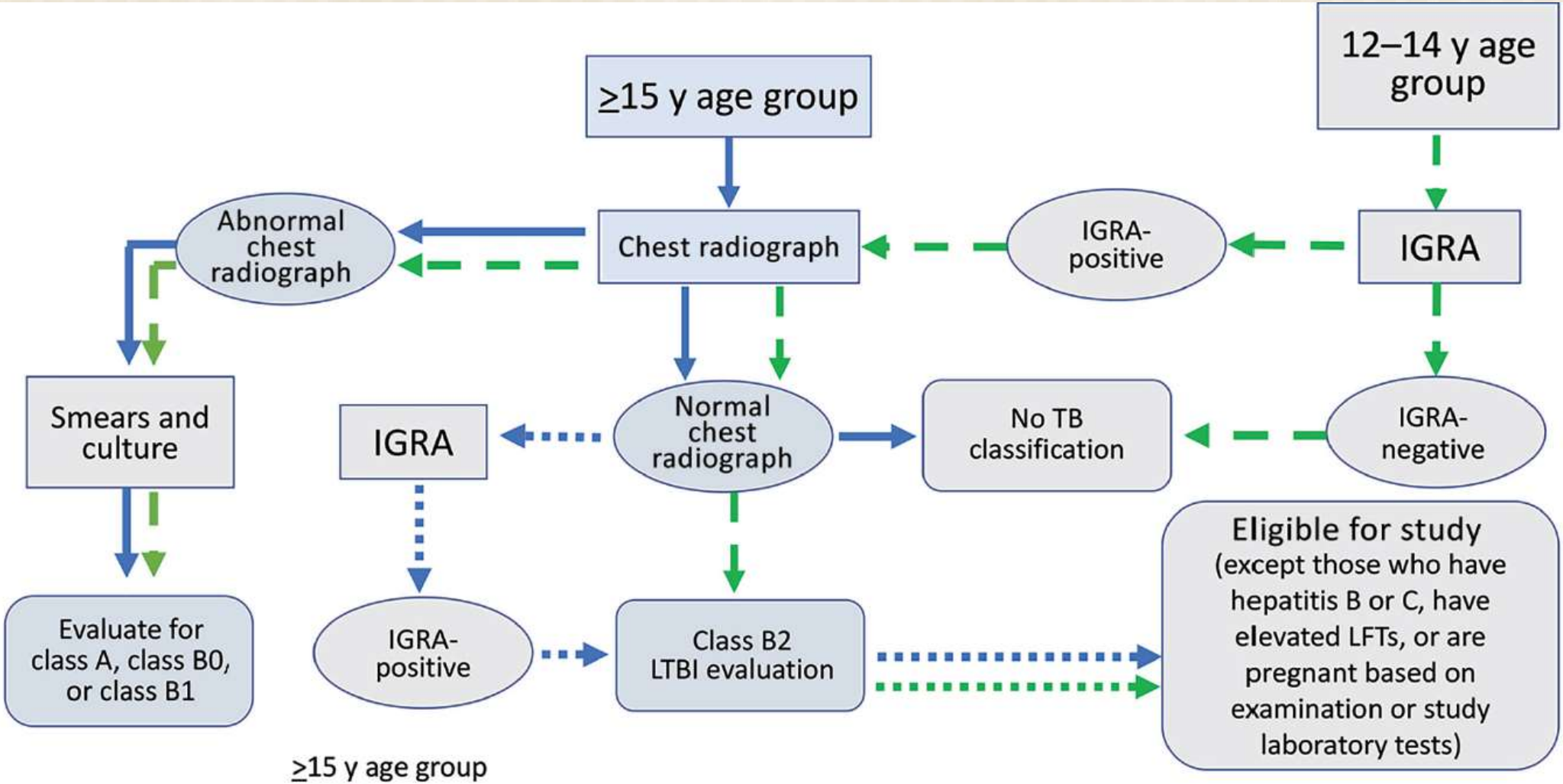

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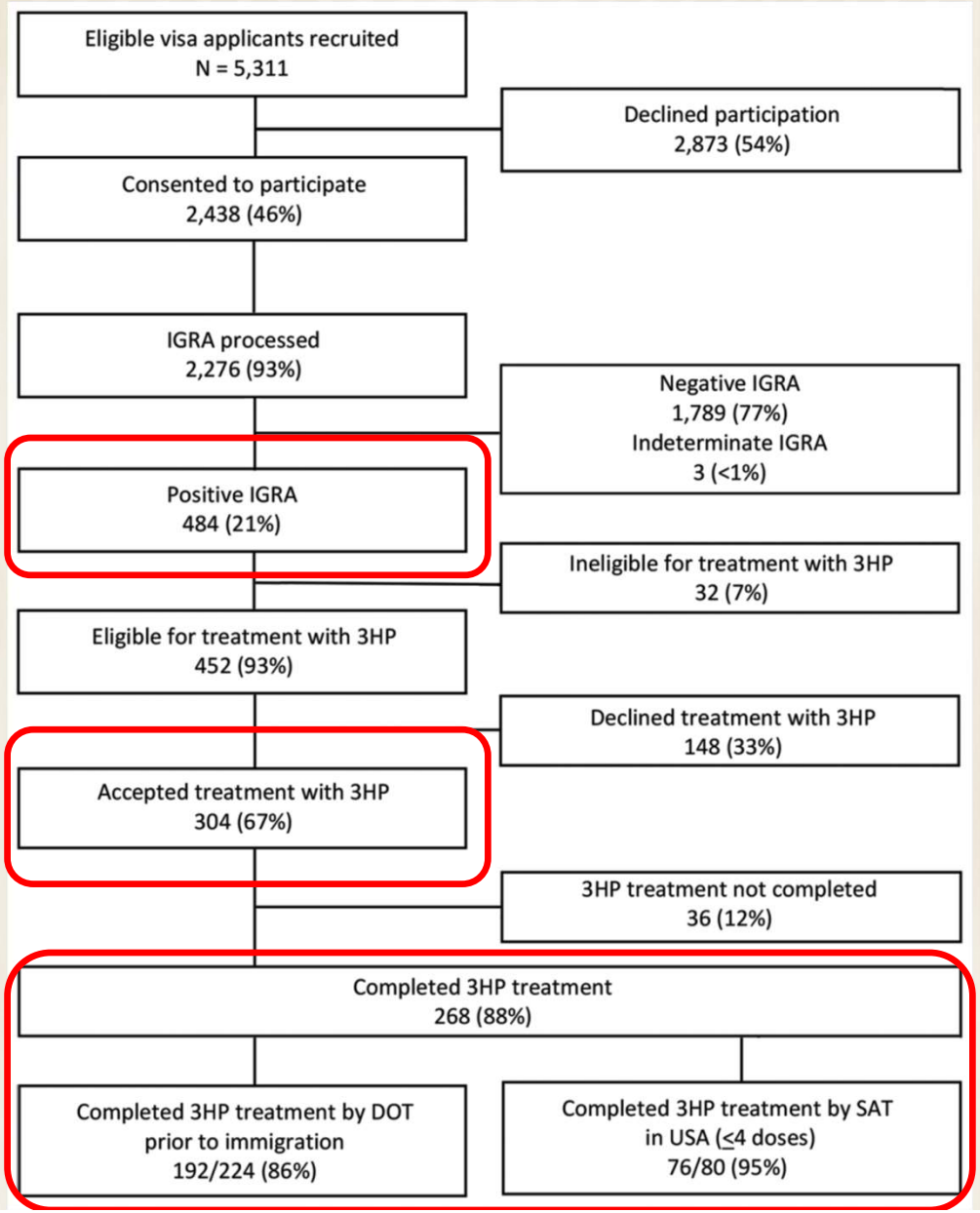

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Table 1. Characteristics of study participants in the Preventing Tuberculosis Overseas Pilot Study of US immigrant visa applicants, Vietnam, 2018–2019*

Characteristic	No. (%) participants						
	Recruited	Enrolled	IGRA processed	IGRA-positive	3HP-eligible	Initiated 3HP	Completed 3HP
Total	5,311	2,438	2,276	484	452	304	268
Sex							
F	2,888 (54)	1,350 (55)	1,304 (57)	272 (56)	259 (57)	170 (56)	152 (57)
M	2,423 (46)	1,088 (45)	972 (43)	212 (44)	193 (43)	134 (44)	116 (43)
Age group, y							
12–14	298 (6)	143 (6)	142 (6)†	9 (2)	9 (2)	4 (1)	4 (1)
15–17	431 (8)	226 (9)	223 (10)	19 (4)	18 (4)	14 (5)	13 (5)
18–35	1,527 (29)	773 (32)	749 (33)	114 (24)	109 (24)	69 (23)	62 (23)
36–65	2,909 (55)	1,254 (51)	1,128 (50)	333 (69)	307 (68)	211 (69)	184 (69)
≥66	146 (3)	42 (2)	34 (1)	9 (2)	9 (2)	6 (2)	5 (2)

*IGRA, interferon-γ release assay; 3HP, 3-mo regimen of isoniazid and rifapentine.
†IGRA required as part of medical examination for participants 12–14 y of age; 1 participant's IGRA was not processed for the study because of recent measles, mumps, and rubella vaccination.

Summary

- There are several important potential barriers making it difficult for recent immigrants to obtain TB-related services in the U.S. Services and payment can vary widely among the U.S. states
- Information about the patient is often difficult for caregivers to obtain; in many cases, tests of infection and chest radiographs need to be repeated
- Retesting children categorized as B2 TB, LTBI Evaluation results in a large reduction in the number of children who would benefit from treatment
- Many children classified as B1 TB have what we consider to be TB disease, and there are many potential delays in getting them on treatment
- Many children do not present for follow up TB care in the U.S. **Treat as many as you can in country!!!**

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