

# The New York Experience with IGRAs

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*Product names are provided for identification purposes only  
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# Financial Conflict of Interest Disclosure

- I am receiving no honorarium for this meeting
- I am not a member of any speakers' bureau, nor a paid consultant to any company involved in the manufacture or production of a interferon gamma release assay (IGRA) or any other diagnostic device related to TB and have no equity interest in any such company

# NYC DOHMH Chest Clinics

- NYC DOHMH operates 9 chest clinics located across the city
- Provide testing, evaluation, and treatment for active tuberculosis (TB) and latent TB infection (LTBI) at no cost to the patient
  - ~25,000 tuberculin skin tests (TST) per year
- Clientele are 50% foreign-born and most were seeking a test to meet a work, school, or other testing requirement

# Decision to Use QFT-G

- High TST positivity rate (~20%) and low LTBI treatment acceptance and completion (~40%)
  - Many patients did not accept or complete LTBI treatment because they believed their TST was only positive due to BCG vaccination
- ~10% of patients did not return for their TST reading and many needed to be retested
- In October 2006 began implementing QFT-G in our chest centers
- We are in the process of switching to QFT-GIT

# Initial Steps (1)

- Changed NYC health code
  - Allows use of a FDA approved interferon-gamma release assay (IGRA) or TST when testing is required
  - Children <5 years old are reportable if positive TST or positive FDA approved IGRA
- Contracted with Quest Laboratories to provide QFT-G testing
  - Could accommodate evening and weekend clinic hours

# Initial Steps (2)

- Gave presentation to clinic physicians
- Created QFT-G testing protocol and conducted trainings for clinic staff including phlebotomy training
- Developed a QFT-G fact sheet for patients and posted signs announcing the new test

# Use of QFT-G

- QFT-G became the standard test for TB infection at each clinic where it was implemented
- TST is still the primary test used in the field
  - QFT-G has been successfully used for select outbreak investigations, expanded contact investigations, and targeted testings

# Difficulties Encountered (1)

- Initial problems with pick-up schedule and sample processing procedures at Quest
  - QFT-G could not be handled like other specimens due to time constraint on initiation of sample processing
  - Quest changed several of their internal procedures
- Introducing phlebotomy into the testing routine was difficult because initially we did not have enough staff adequately trained
  - Not entirely moving burden of work from clinic to lab
- Change in culture for the patients and staff since now results can be mailed
  - Many patients still wanted to pick-up results since they wanted them ASAP for clearance

# Difficulties Encountered (2)

- Lack of information on QFT-G for several topics
  - How does treatment affect test results?
  - Should you always administer QFT-G to someone with a positive TST prior to initiating LTBI treatment?
  - Can a TST boost a QFT-G result?
  - Should all positive patients be treated?

# Clinical Issues and NYC Policy (1)

- QFT-G testing after patient has started treatment for either LTBI or TB
  - Not done regardless of number of days of treatment
  - A negative QFT-G result should not influence decision to continue treatment
- Window period when using QFT-G
  - Using 8 weeks like for TST
  - Window prophylaxis policy same as with TST

# Clinical Issues and NYC Policy (2)

- QFT-G when patient is TST positive
  - No documentation of TST → patient can have QFT-G
  - Documented history of a prior positive TST
    - Treatment offered on the basis of the positive TST
    - QFT-G should not be done to confirm the TST even if the patient is reluctant to take treatment but the physician may decide to test based on clinical information
- Potential TST boosting of QFT-G
  - No definitive evidence
  - We do not impose a time frame between administering a TST and then a QFT-G test

# Handling of QFT-G Results

- Positive
  - Patient receives medical evaluation and chest radiograph to exclude active TB and confirm LTBI
  - Offered LTBI treatment based on 2000 ATS/CDC guidelines
- Negative
  - Not used alone to exclude *M. tb* infection in symptomatic or high-risk persons
  - Refer to clinician if immunocompromised, a high-risk contact, or symptomatic
- Indeterminate
  - Offer repeat QFT-G and if patient refuses, provide TST

# Benefits of Using QFT-G

- The absolute cost of the test is expensive compared to the TST, but may be more cost-effective overall
  - Have test result after 1 visit
    - Clinics are less crowded and operate more efficiently
    - Staff can focus on those with a positive result
  - Decreased cost for patients because they do not need to return to obtain their result
  - Fewer chest radiographs
- Potential increase in LTBI treatment completion

# NYC DOHMH QFT-G Results

## *Comparison to Historical TST Results*

# Obtaining a Result with QFT-G vs. TST

	QFT-G*	Historical TST†
<b>No Result</b>	799 (2%)‡	3903 (11%)§
<b>Result</b>	38,087 (98%)	32,988 (89%)
<b>Total</b>	38,886	36,891

\*QFT-G results from October 1, 2006 – December 31, 2008

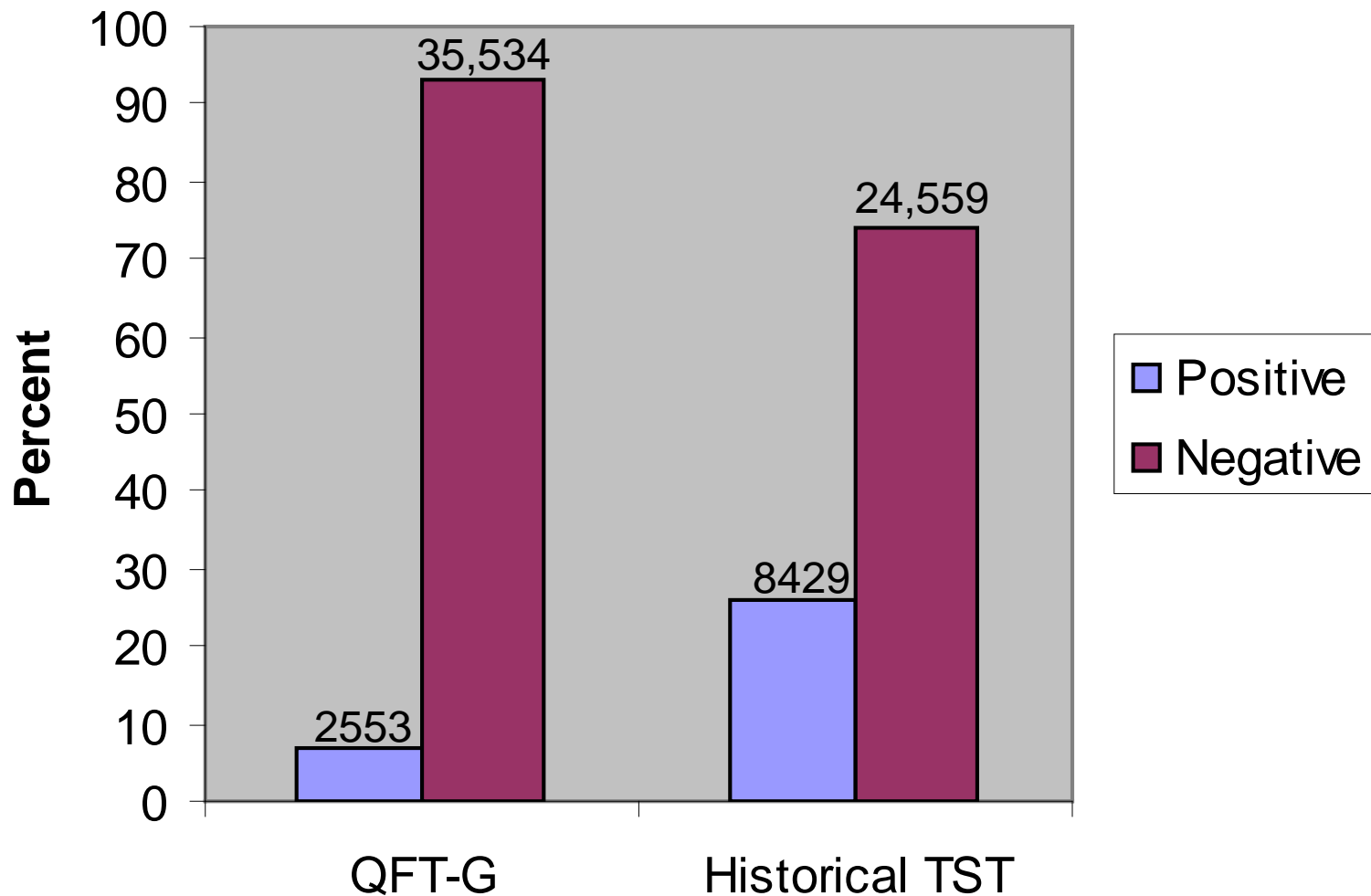
†Historical TST results from January 2002 – August 2004

‡627 due to an indeterminate result (304 High Nil, 323 Low Mitogen)

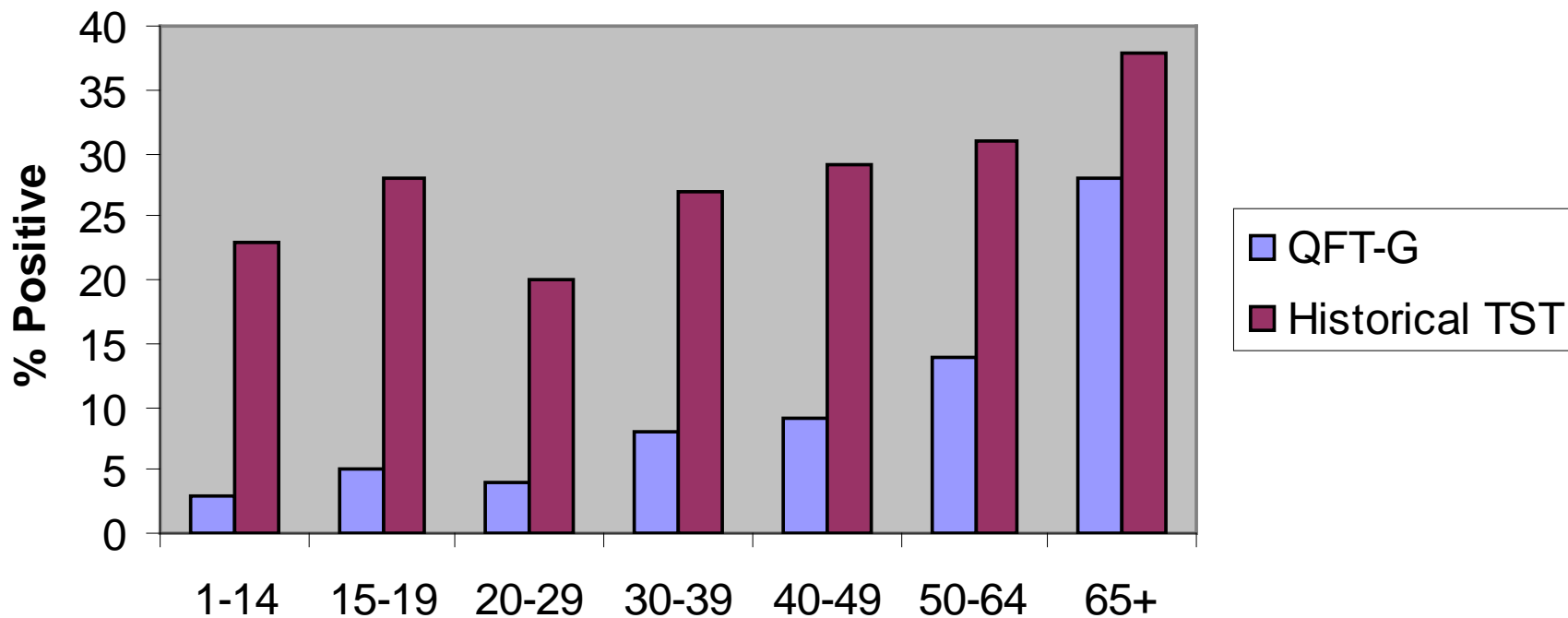
172 due to not able to draw blood (75), lab reported there was not enough blood (31), no pick-up or received by the laboratory >12 hours after blood draw (38), or other logistical problem (28)

§Patients with TSTs implanted but not read

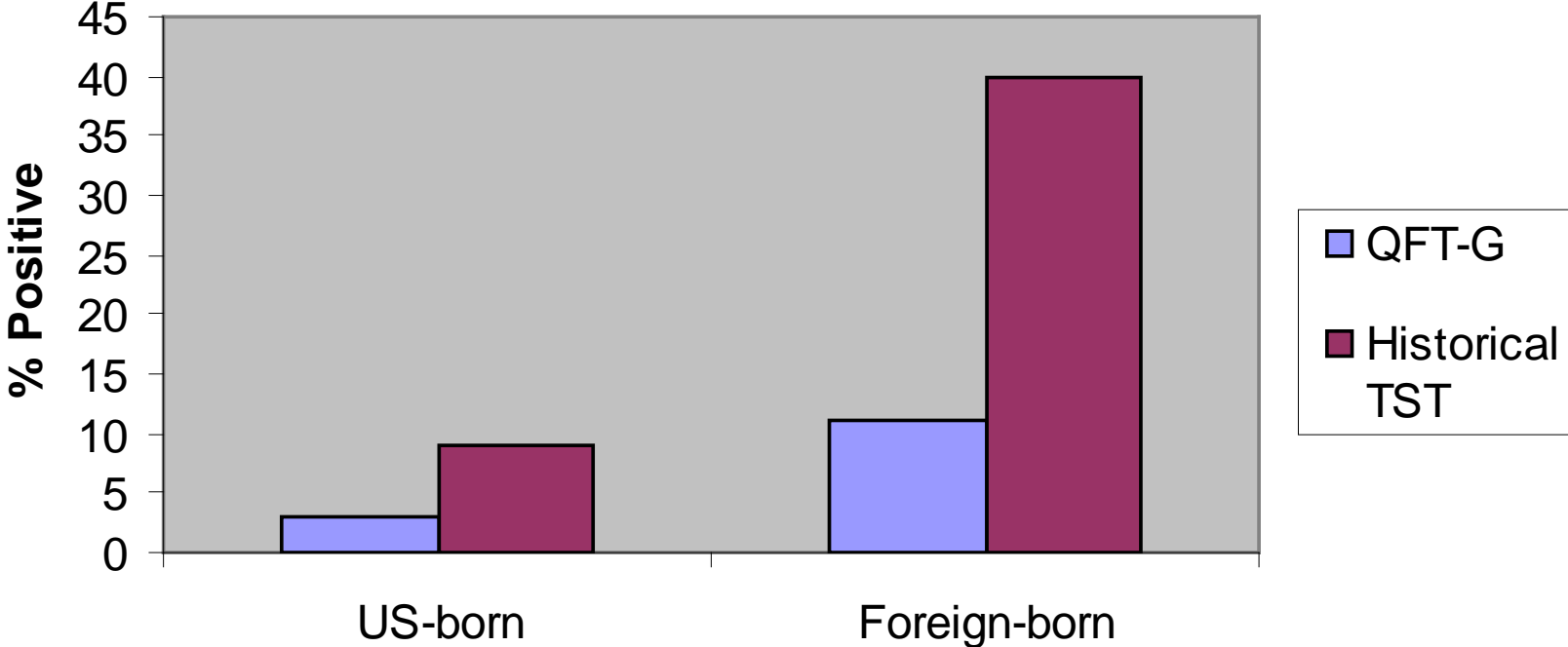
# Proportion of Patients with a Positive Test Result



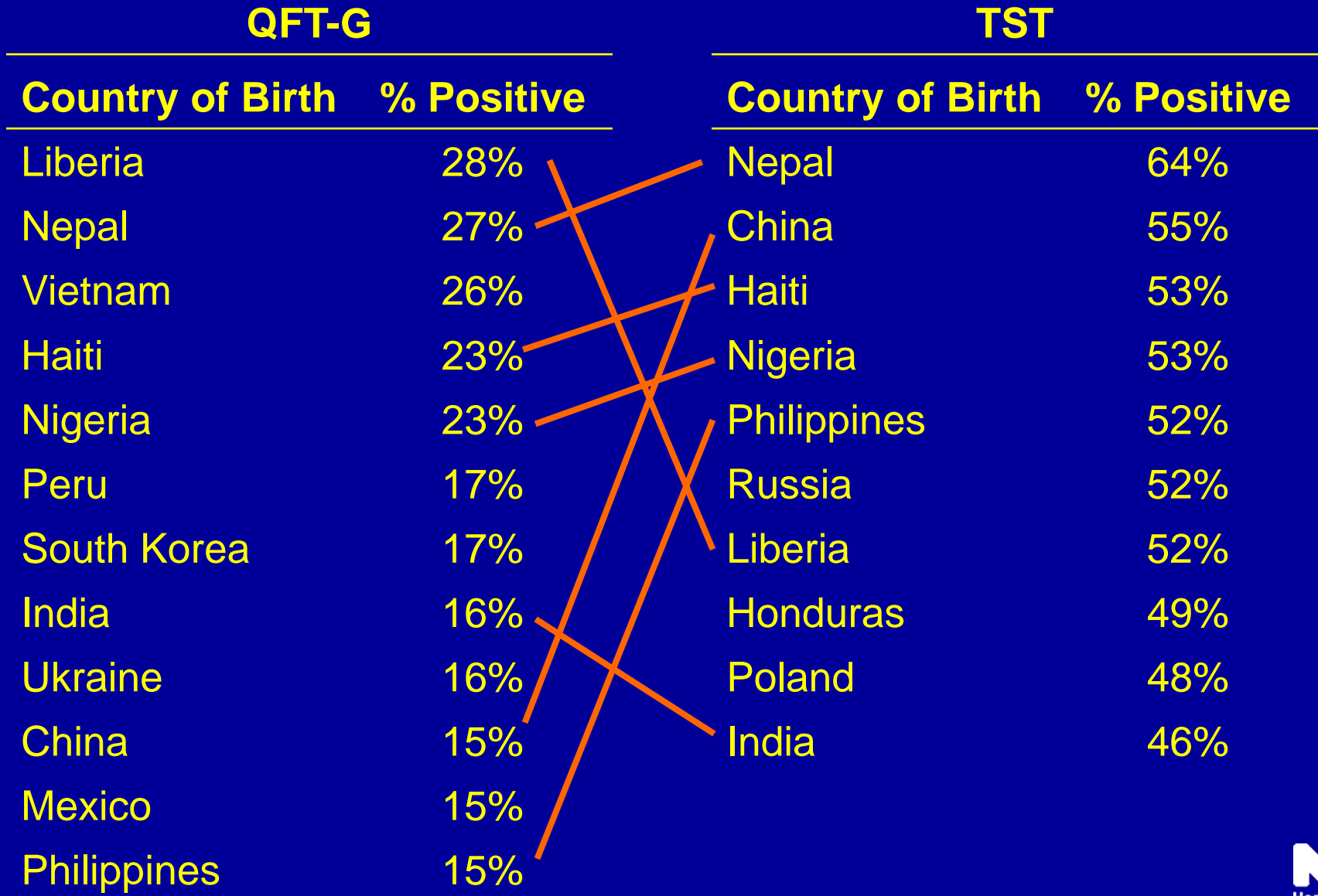
## Age (years)



# Country of Birth



# Proportion of Patients who Test Positive by Country of Birth



# *Contacts*

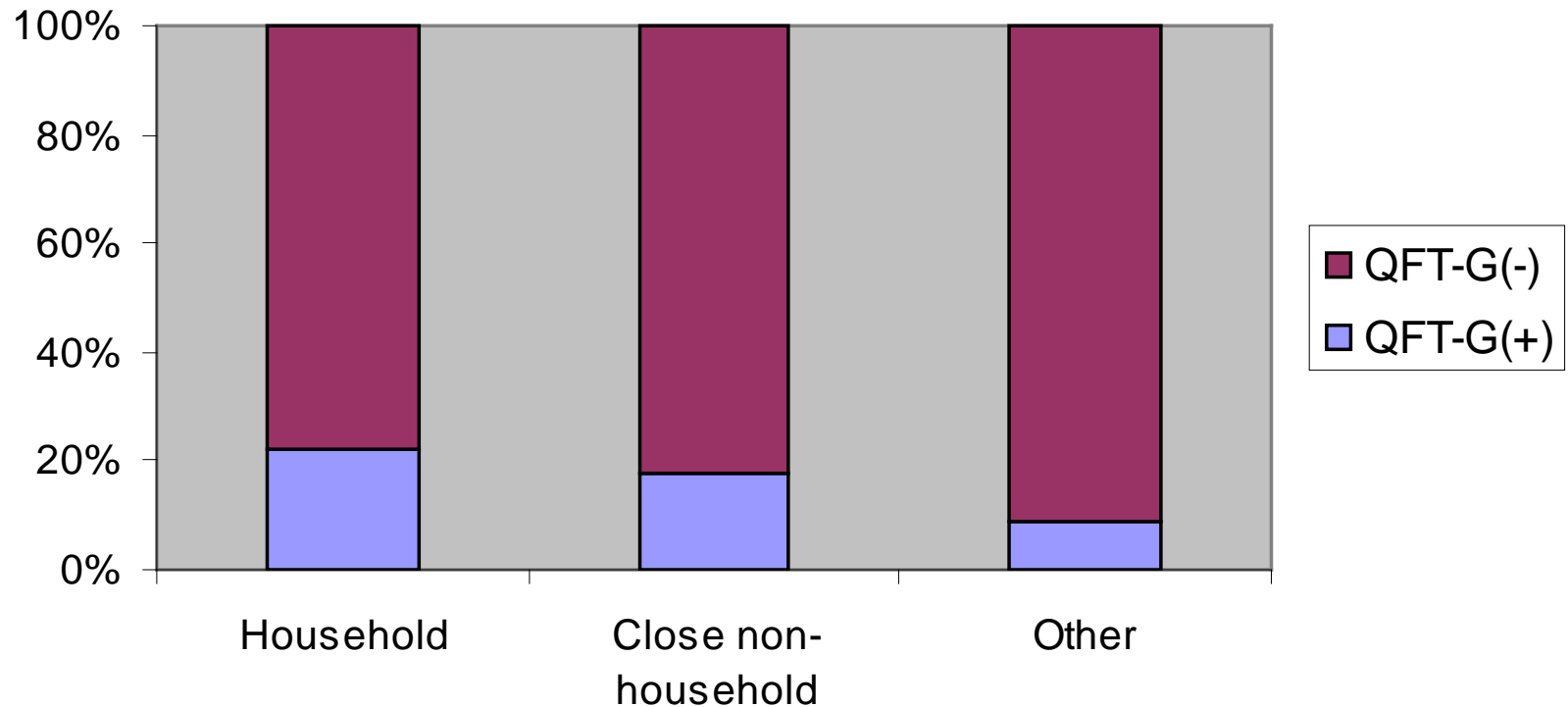
# QFT-G Results Among Contacts

Final results among contacts to TB patients tested only with QFT-G, October 2, 2006–November 6, 2008

	N (%)
Positive	137 (19%)*
Negative	588 (80%)
Indeterminate	5 (1%)
Total	730

\*7% in the overall clinic population had a positive QFT-G test

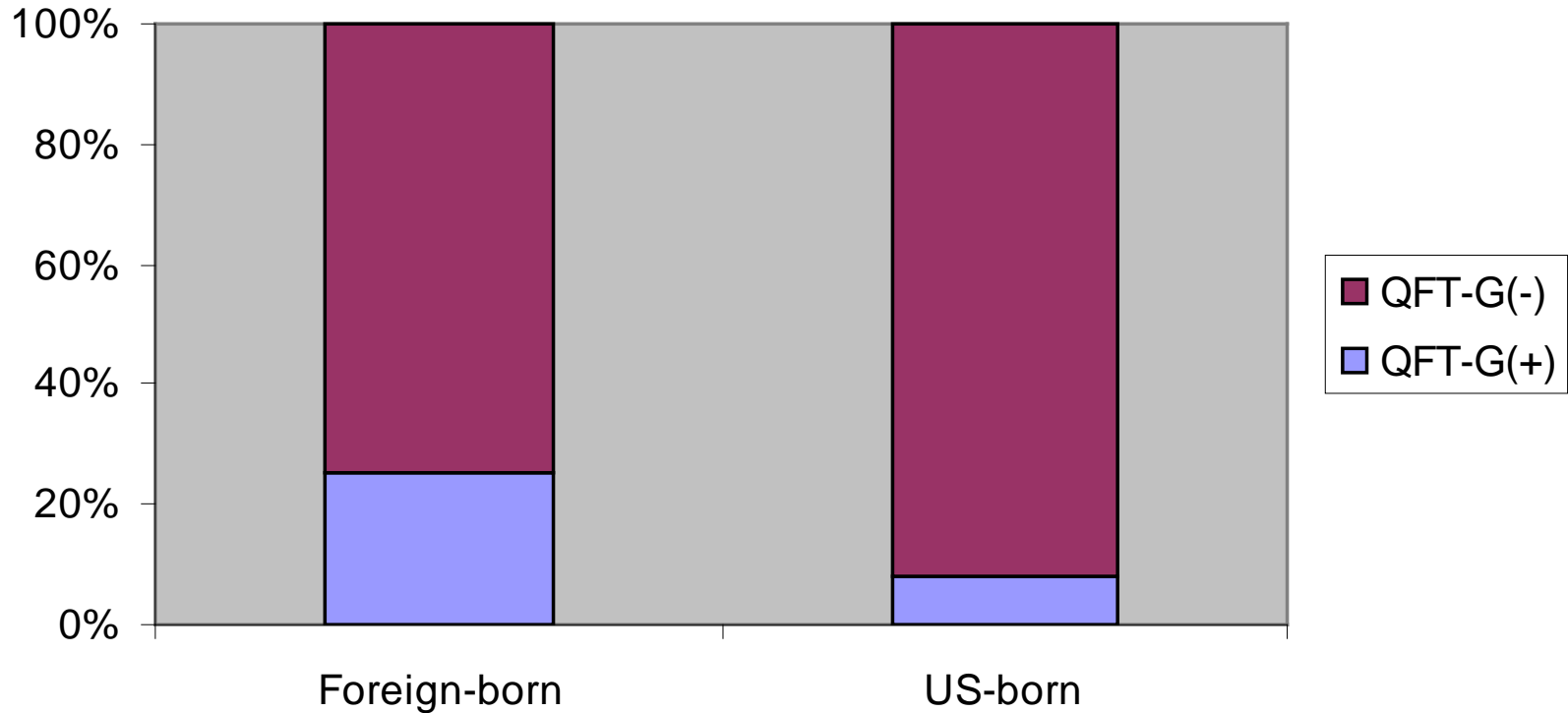
# QFT-G Results by Type of Contact



Household vs. Other (22% vs. 9%),  $p=0.04$

Close non-household vs. Other (18% vs. 9%),  $p=0.2$

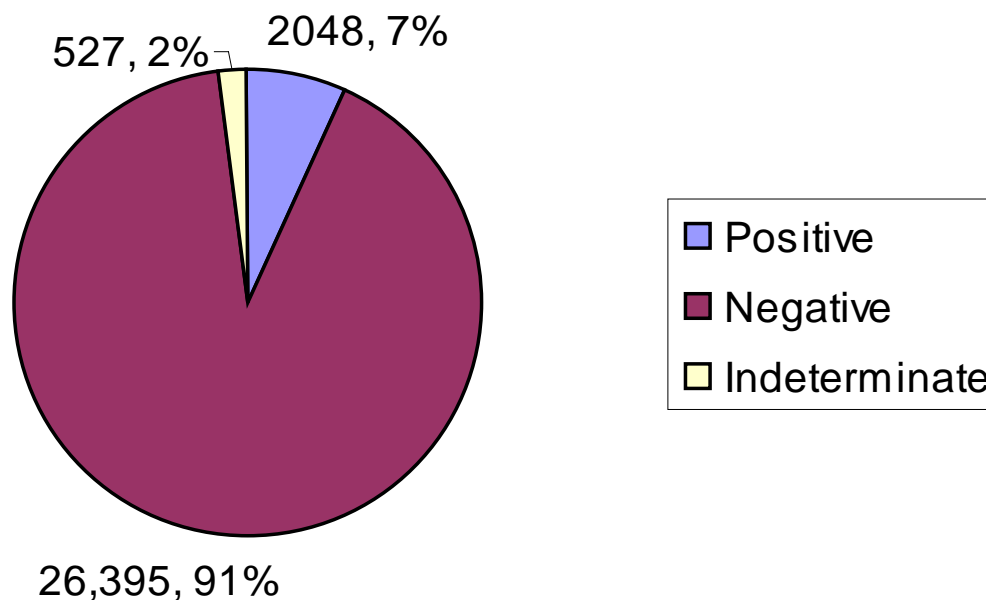
# QFT-G Results by Area of Birth



QFT-G(+): 26% vs. 8%  
 $p < 0.001$

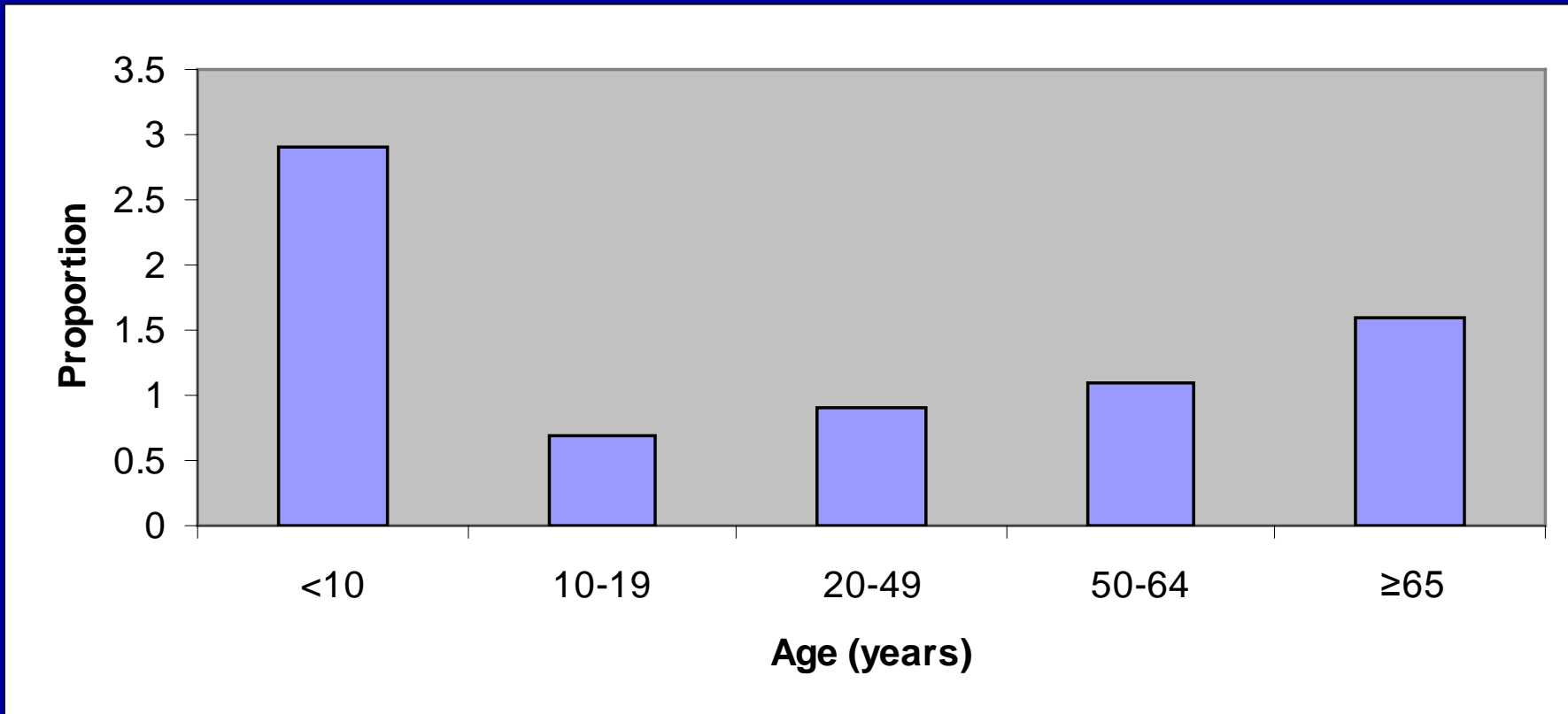
# *Indeterminate Results*

# Results of the initial QFT-G test in NYC DOHMH clinics October 1, 2006-July 26, 2008 (N=28,960)



268 (51%) were due to low mitogen  
259 (49%) were due to high nil

# Proportion with a Low Mitogen Result by Age\*



\*Compared to those with a negative or positive result

# Results in Children <10 Years

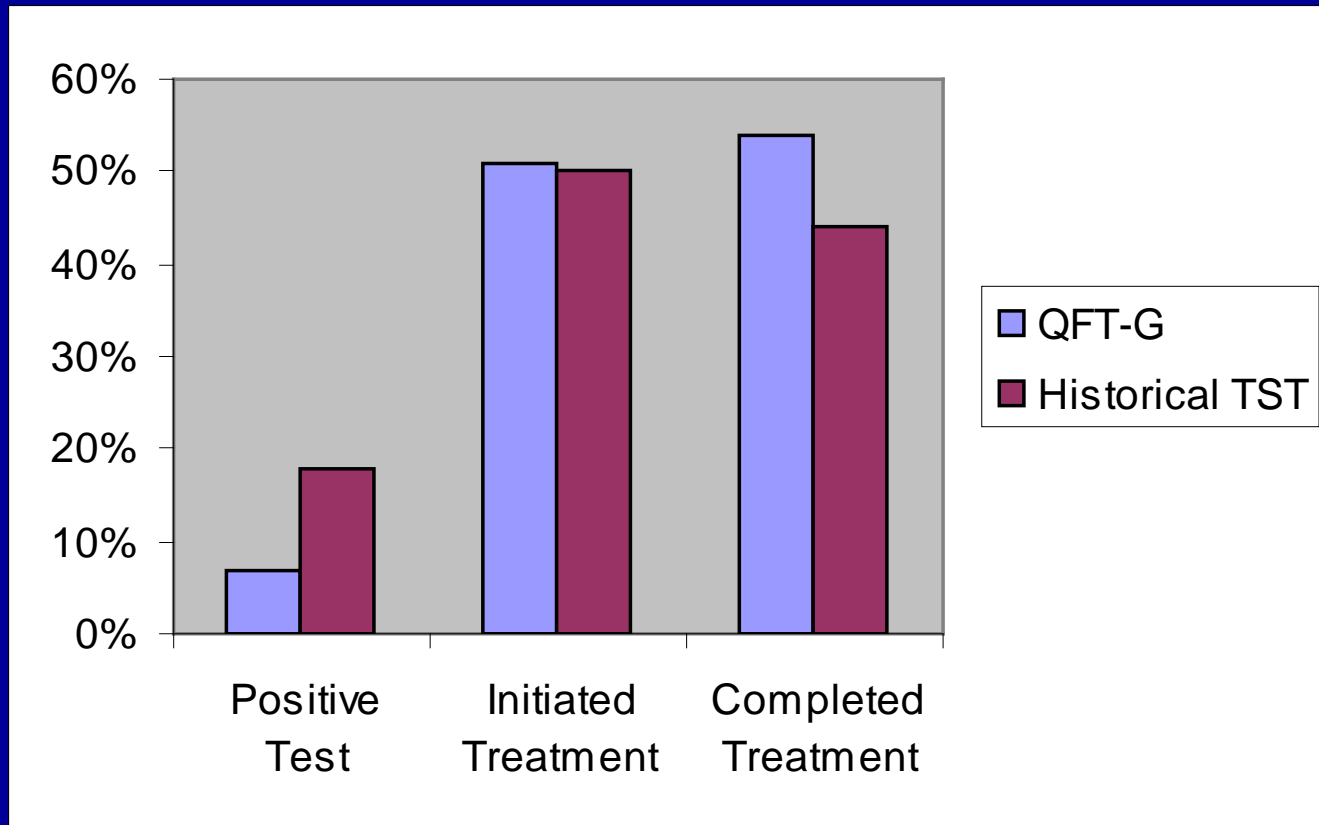
Age	Positive	Negative	Low Mitogen	%	High Nil	%
<1	0	1	0	0%	0	0%
2	0	11	1	9%	0	0%
3	0	38	1	3%	0	0%
4	2	89	5	5%	0	0%
5	2	136	2	1%	3	2%
6	4	117	4	3%	2	2%
7	5	137	4	3%	1	1%
8	7	164	4	2%	1	1%
9	8	160	2	1%	2	1%

# Repeat Testing Following an Indeterminate Result

- Most (71%) who had an initial QFT-G indeterminate test result returned for a 2<sup>nd</sup> QFT-G or a TST
- A substantial proportion (31%) who underwent repeat QFT-G testing had a 2<sup>nd</sup> indeterminate result
  - For all of these patients, the 2<sup>nd</sup> indeterminate result was of the same type
    - 81% had the repeat test within 1 week so we could not examine if increased time between the tests reduced the proportion of repeat indeterminate results
    - Considering policy of waiting 4 weeks to repeat QFT-G for those with an initial indeterminate result

# *LTBI Treatment*

# LTBI Treatment Completion



- Data from patients tested with QFT-G from October 2006–December 2008 in NYC (N=38,984)
- Historical TST data from October 2004–September 2006 (N=37,713)

# Conclusions

- Biggest advantage of QFT-G: test results for 98% of patients
- Fewer patients tested positive with QFT-G than historically with TST
  - Higher QFT-G positivity is associated with known TB risk factors (e.g. non-US birth)  $\Rightarrow$  differences may be due to QFT-G's higher specificity
- QFT-G seems to perform well for testing contacts
- Overall indeterminate rate is acceptable, but low mitogen rate is higher for young children