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TB, IGRA's and the Integration of Quantiferon Gold –IT into Public Health Practice in Mississippi

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Mississippi Population: 2,936,618

- TB cases 2008: 118 (4/100,000)
- Rank: #15 overall
- Rank #2: TB case rate U.S. born (LA#1)
- 405.8 additional suspects
- 268 atypical mycobacterial disease
- 1849 LTBI

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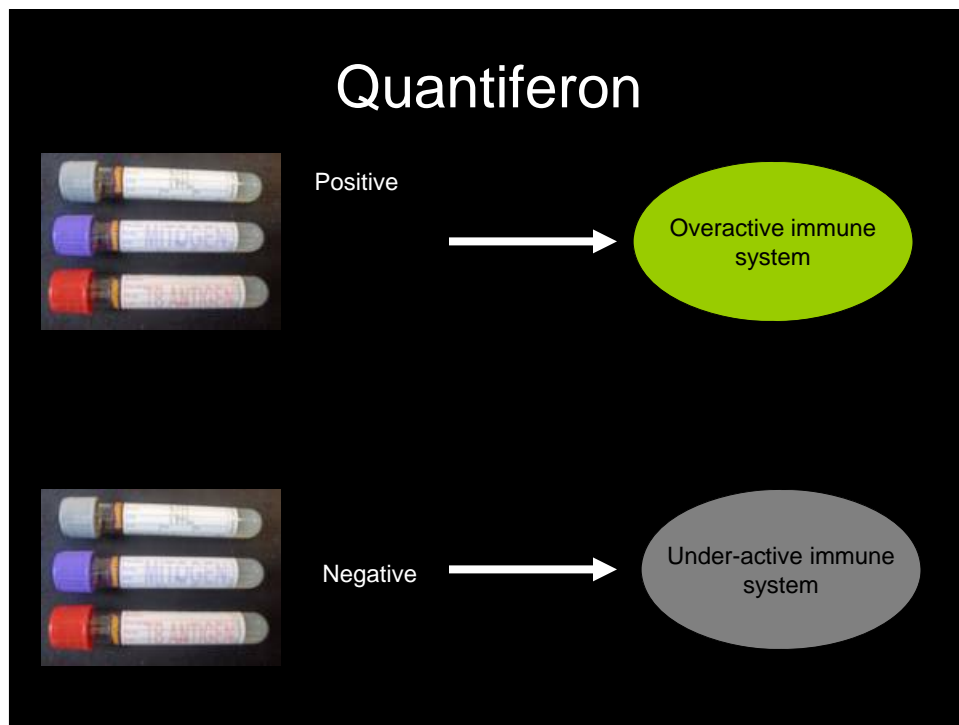
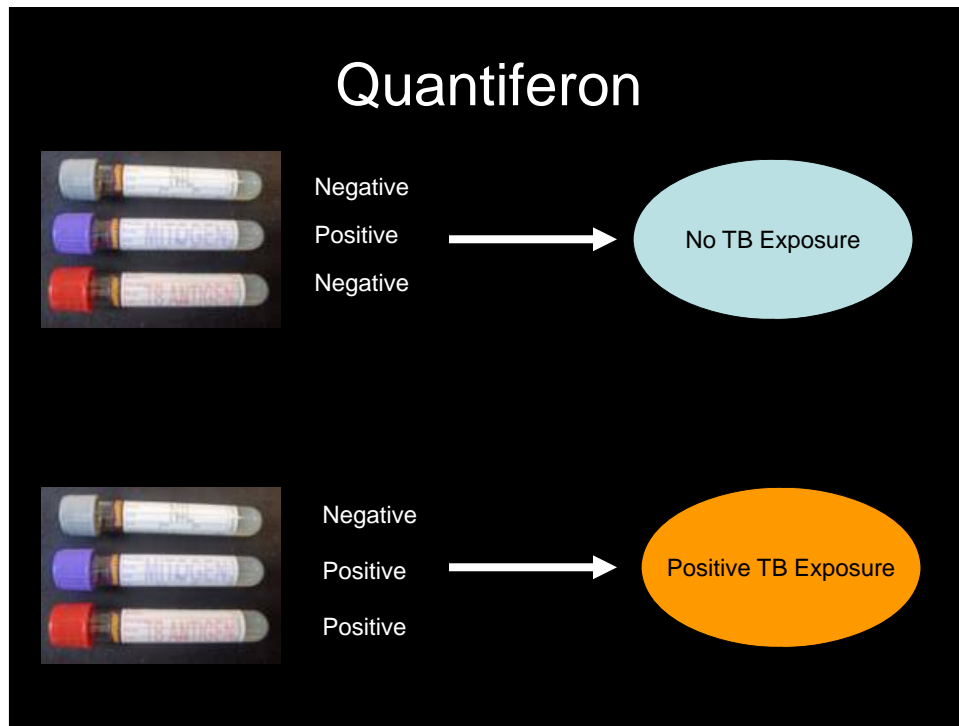
- 68% TB cases among African Americans
- 93.2% of cases US born (highest in US)
- 14% homeless
- 15% HIV positive (25-44yo)

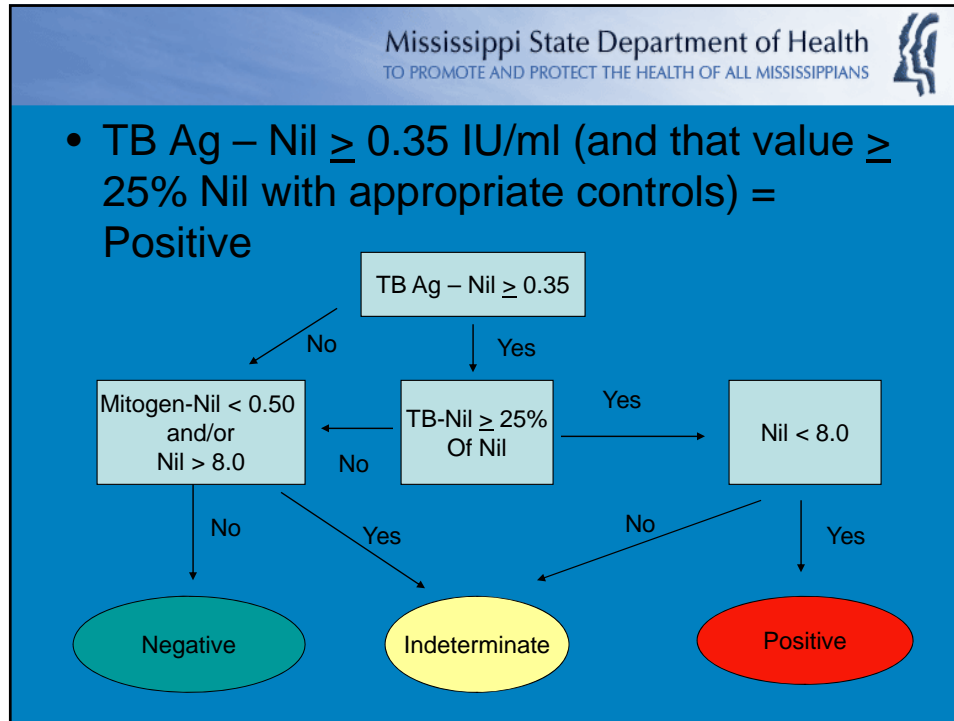
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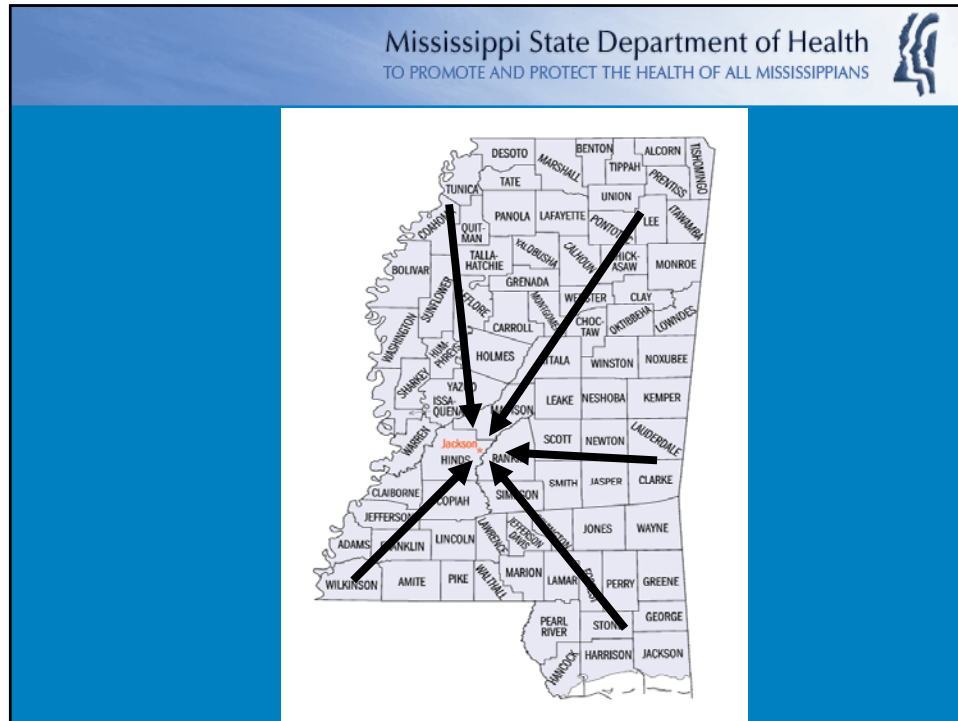
Diagnosing Latent TB

- Tuberculin Skin Testing
- QFT for: TB suspects, HIV positive, may not return for reading, prior BCG





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- MS Public Health Lab: Started IGRA (Quantiferon-Gold-InTube) 2008
 - 7/31/08 – 8/14/09: 554 specimens
 - 112 (20%) positive
 - 424 (77%) negative
 - 18 indeterminate (8 HIV-, 2 HIV+, 8 ?)
 - 14 Culture confirmed TB cases with QFT (11 QFT+, 3 QFT-)



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- Specimens collected at county health department
- Incubated, centrifuged on site
- Overnight courier
- Specimens stable – 3 days at room temp, up to 4 weeks refrigerated, up to 4 months frozen



Rationale of IGRA's in MS

- Similar (? Improved) Sensitivity vs. TST
- Enhanced specificity
 - NTM exposure
 - BCG vaccination
- Single site visit
- Objectivity of readings
- Correlation with exposure / risk of developing active disease
- Cost effective?



Enhanced Specificity vs. TST

- NTM (MAC)
- BCG: Although few foreign born cases in MS, large immigrant presence in certain local industries. Universities. Military bases (Afgan/Iraqi trainers)

Int J Tuberc Lung Dis. 2001 Dec;5(12):1122-8.

Skin test reactions to Mycobacterium tuberculosis purified protein derivative and Mycobacterium avium sensitin among health care workers and medical students in the United States.

[vonReyn CE](#) [Horsburgh CR](#) [Olivier KN](#) [Barnes PF](#) [Waddell R](#) [Warren C](#) [Tvaroha S](#) [Jaeger AS](#) [Lein AD](#)
[Alexander LN](#) [Weber DJ](#) [Tosteson AN](#)

- Dual skin testing was performed with PPD and Mycobacterium avium sensitin on 784 health care workers and medical students in the northern and southern US.
- **CONCLUSIONS:** Infections with NTM are responsible for the majority of 5-14 mm PPD reactions among US-born health care workers and medical students subject to annual tuberculin testing.

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Disadvantages

- Cost to lab/ TB program
- Logistics (blood draw/transportation/ infrastructure)
- Lack of experience with IGRA's

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Judicious Application of Resources



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Primum Non Nocere & Bayes' Theorem



Isoniazid Toxicity

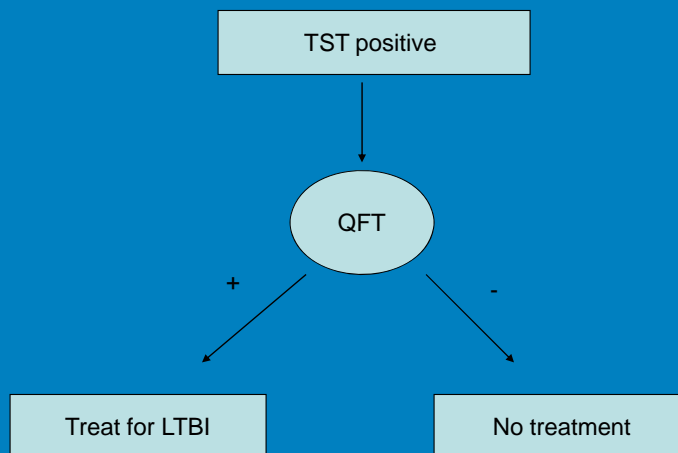
- Generally safe and effective
- Hepatitis may result ~ 20/1000 persons treated*
- < 7/100,000 Fatal hepatitis **

*Am Rev Respir Dis 1978;117:991-1001

**Am Rev Respir Dis 1992;145:494--497.



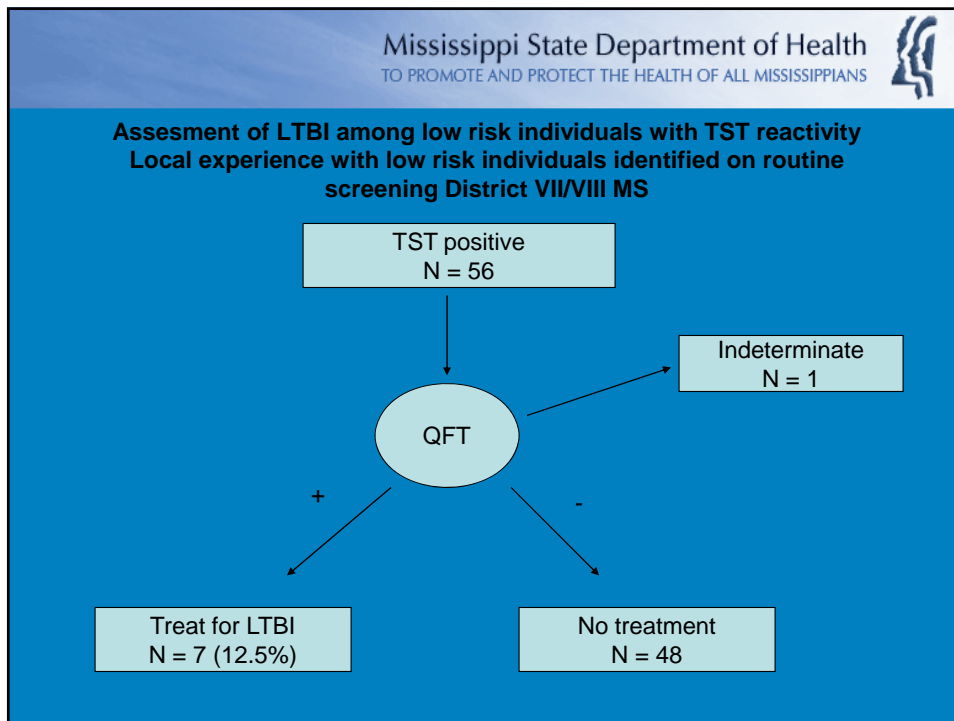
Assesment of LTBI among low risk individuals with TST reactivity



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Assessment of LTBI among 56 low risk individuals with TST reactivity

Age	Race	Sex	TST	Reason for TST
13 – 82 Median 38	62.5% AA 37.5% W	62.5% F 37.5% M	5-20mm	Health sector 26 Adoption/Foster 5 NH admission 6 Military 2 Congregate 6 Childcare 2 Nursing School 6 Other 3



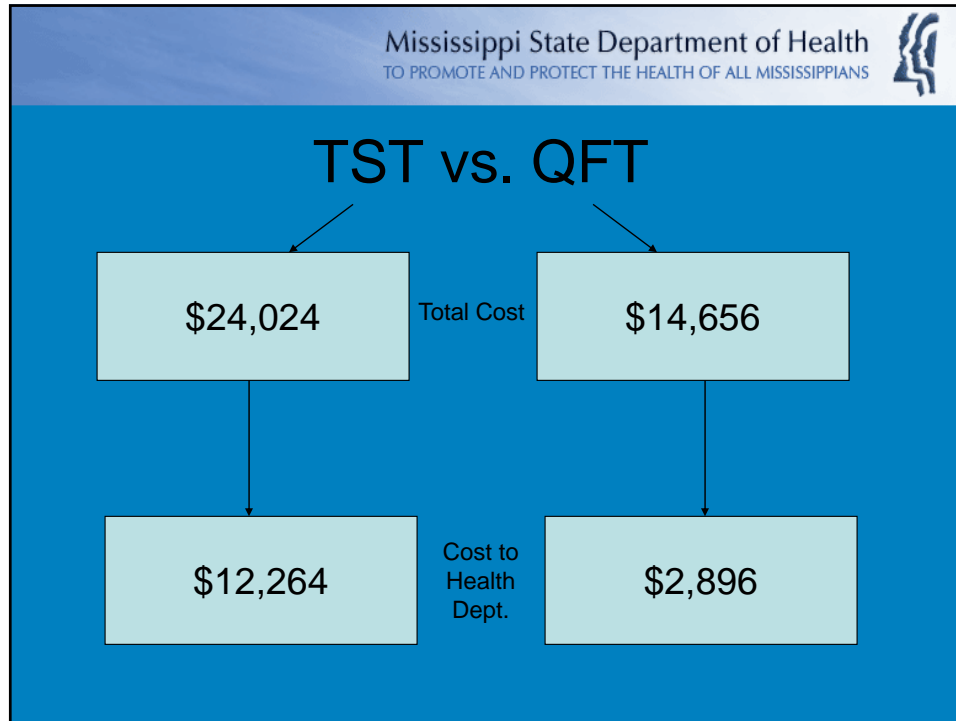
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	TST 5-9mm	TST 10-14mm	TST 15-20mm
Total	3	38	14
Positive	1 (33%)	3 (8%)	3 (21%)

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Funding Issues

- Cost estimates per test – less nursing time
 - TST \$4.41
 - QFT \$21.00
- If follow-up indicated
 - X-ray \$210 - \$390
 - INH \$1.66 x 9 \$15.00
 - Lab \$10.00
 - Nursing/medical visits \$190 – (9 mo.)



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- No TB cases ~ 60 patient years follow-up

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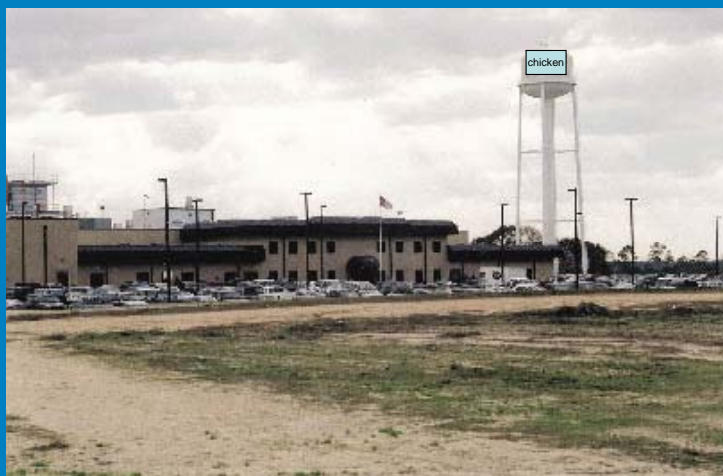


What Happens in the Chicken Plant Should Stay in the Chicken Plant

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Contact Investigation



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- 54 yo chicken plant worker
- Pulmonary TB (cavitary)
- 49 employment related contacts

- QFT testing of all 49 (In-tube)
- CXR performed for QFT positive or based on symptom screening

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Initial Screening

- All collected over 2 consecutive days
- 3 nurses required
- ~12 tubes discarded for over drawing

Number Screened	QFT Positive (1)	QFT Positive (2)	Foreign Born	QFT total cost	LTBI Treatment Cost
49	4 (8%)	0	19	\$931	\$1075



2005 Chicken Plant Contact Investigation

- 21 yo TB case (cavitary)
- 229 employee contacts
- TST on 229 employees

Number Screened	TST Positive (1)	TST Positive (2)	Treated for LTBI	Foreign Born	TST total cost	LTBI Treatment Cost
229	62(27%)	11	52	209	\$1920	\$11,180

TST/QFT Comparison

Test	Positive	Positive Foreign Born	Positive U.S. Born	Total Cost per Person Foreign Born	Total Cost per Person U.S. Born
QFT	4 (8%)	4 (21%)	0	\$65	\$19
TST	73(32%)	70 (34%)	3 (15%)	\$61	\$19



Anecdotes

- BCG and mistrust of TST among foreign born (extends to U.S. born as well)
- False positives QFT's in Healthcare screening
- Initial skepticism by public health nurses – rapid acceptance and now preference