




Pediatric Tuberculosis in Los Angeles County: An Update

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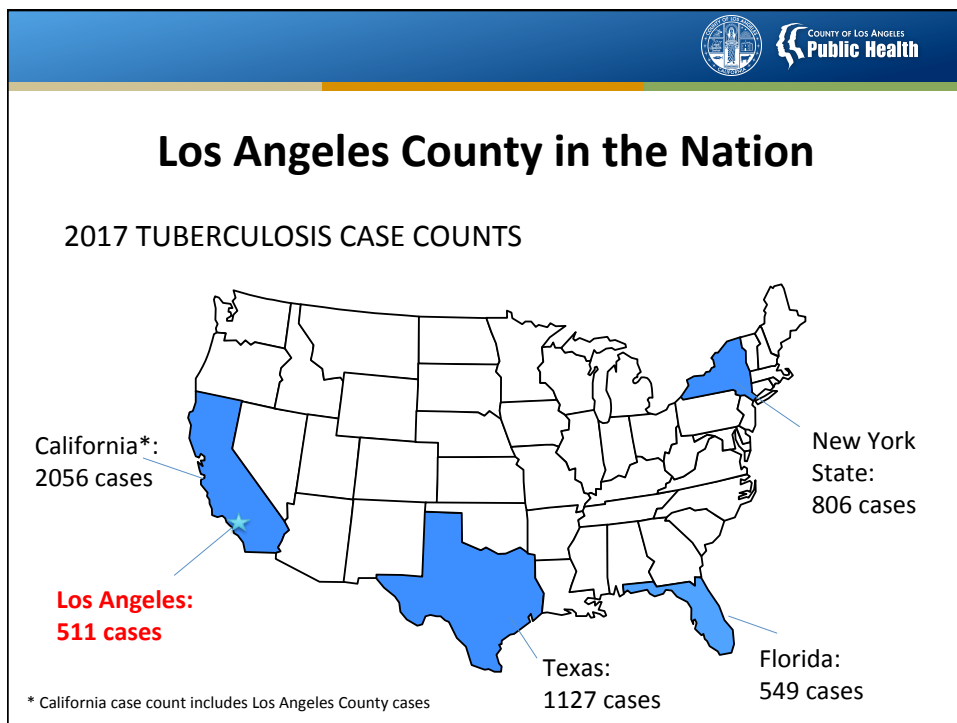
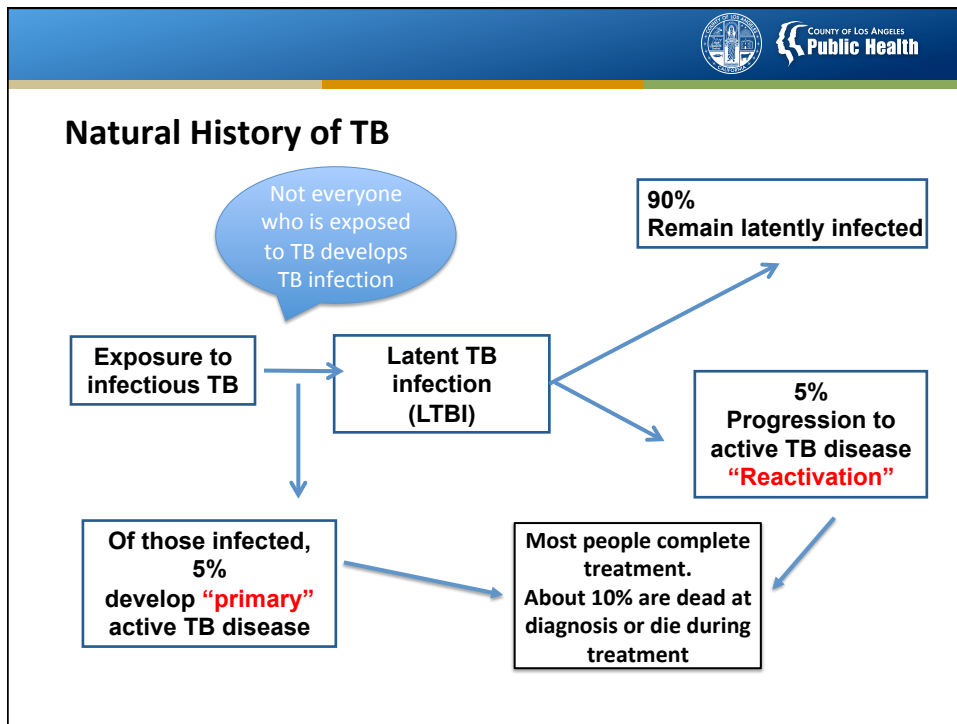


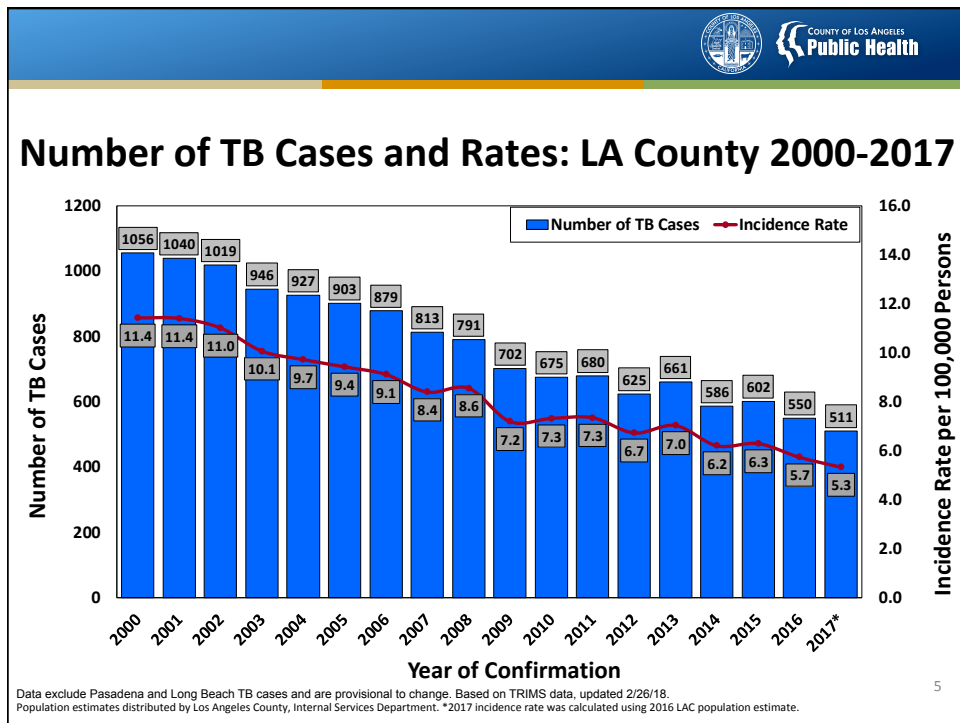
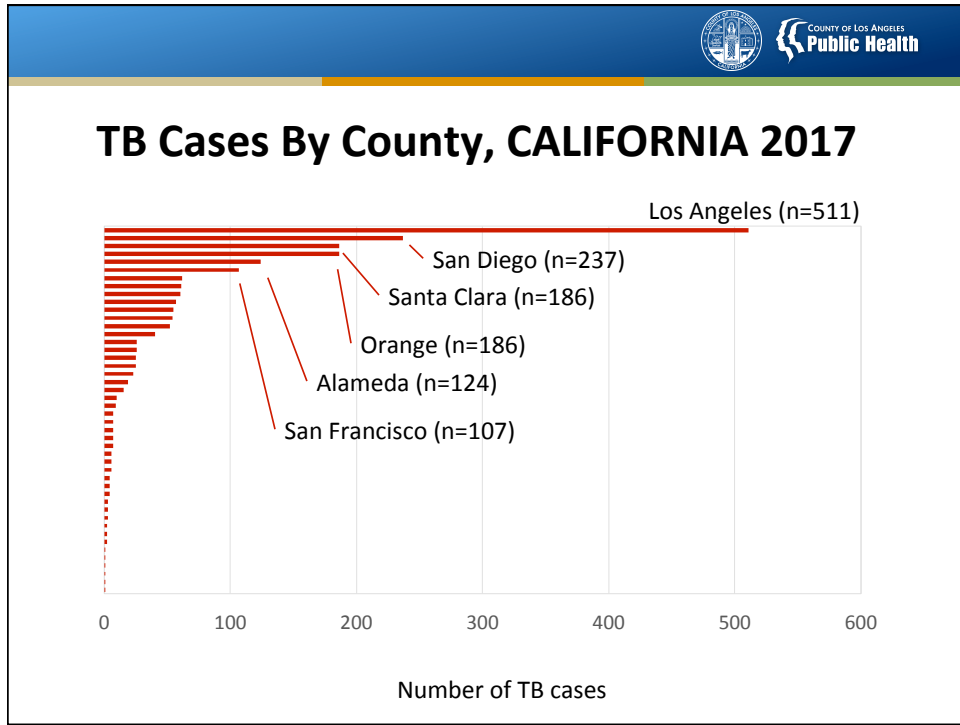
Pediatricians will be the driving force of TB elimination in California




TB elimination = 1/1,000,000 cases

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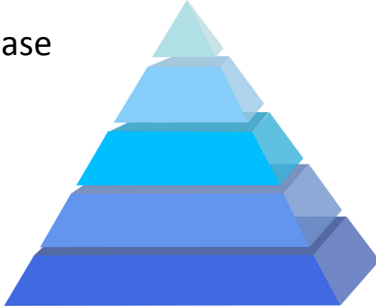




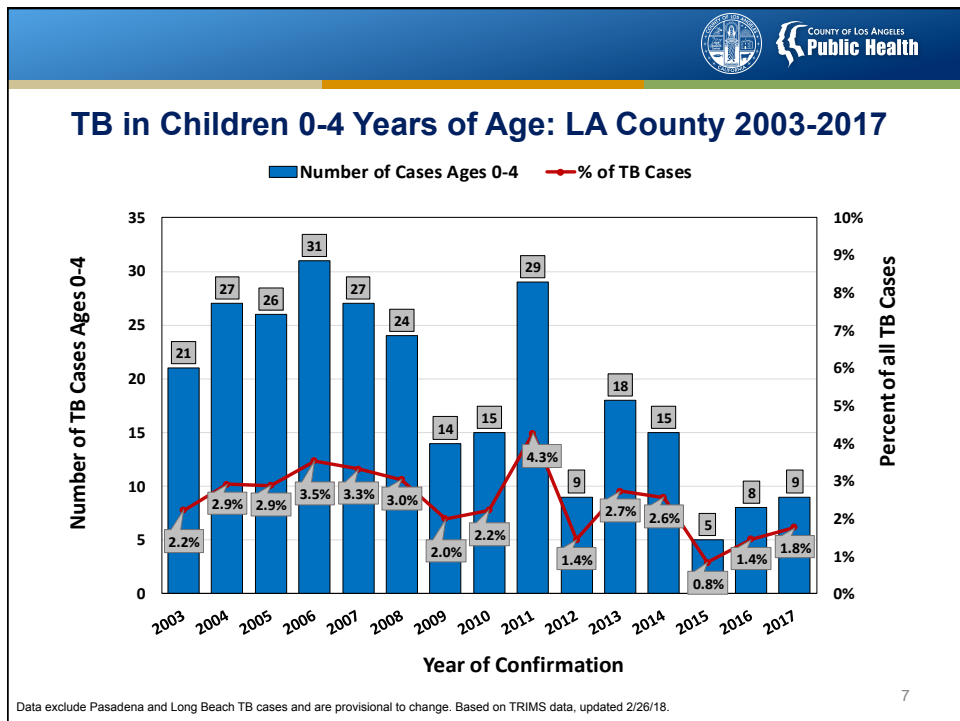


TB in LA County: Overall Burden Annually

- 500-600 cases of active TB disease
- 1,800-3,000 suspected TB disease evaluations
- 3,000-5,000 contacts to infectious TB
- 1,000,000 LA County residents infected with TB



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Pediatric TB cases – 2012-2016

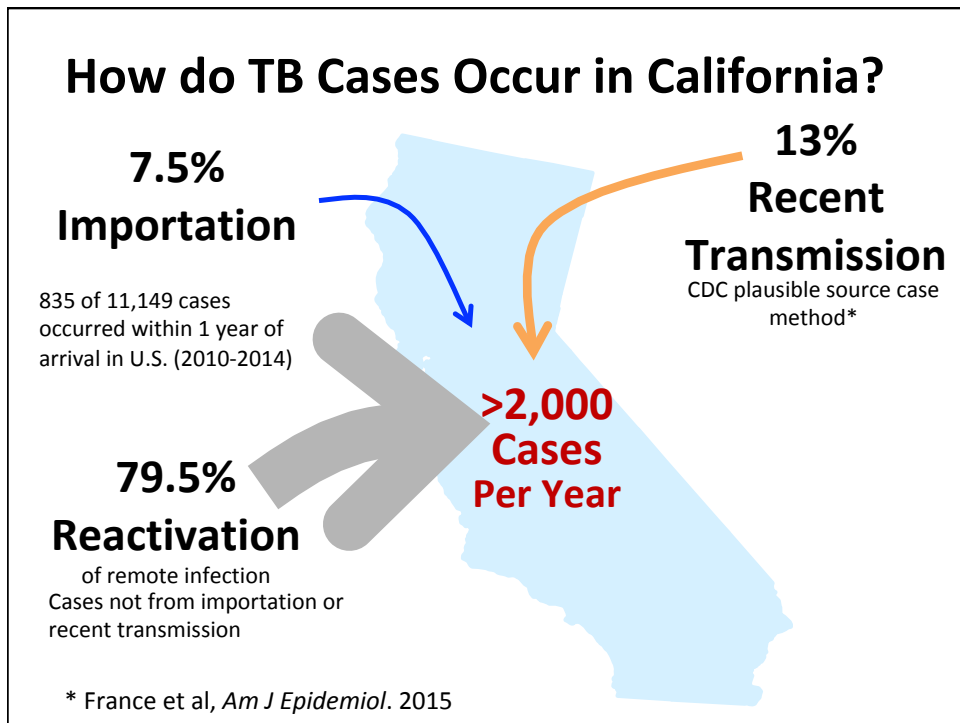
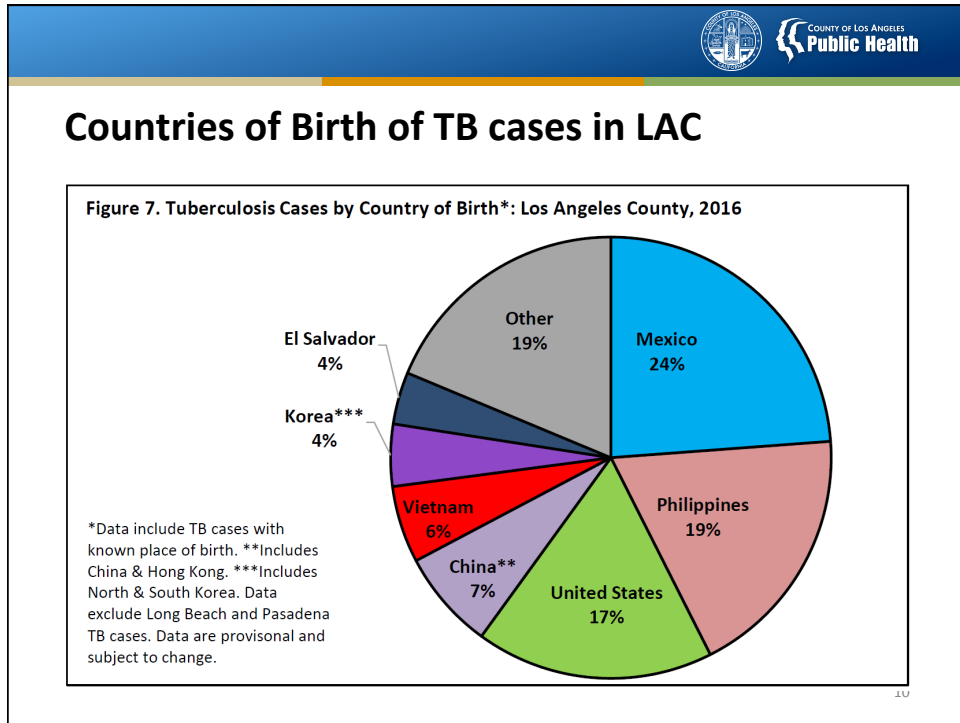
- Pediatric TB = Age <15
- 10 – 25 cases per year
- 1.8% - 4% of all TB cases

- Young children = Age <5
- 8 – 18 cases per year
- 1.5% - 2.7% of all TB cases
- TB in young children = transmission in US!

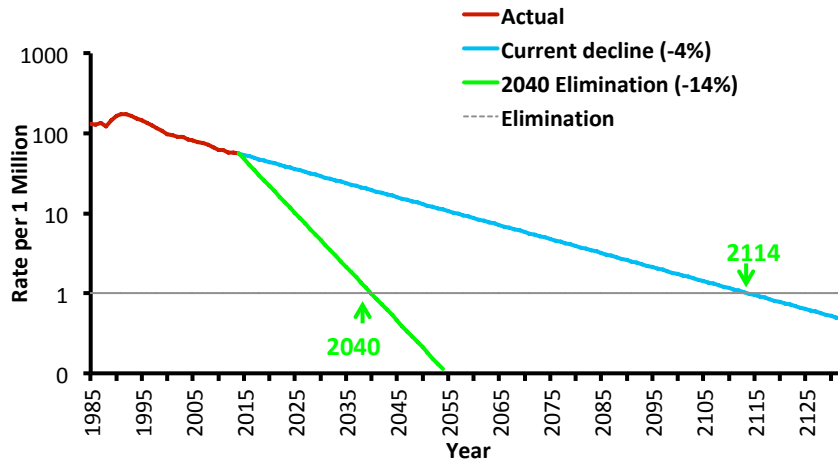
Nativity of Pediatric TB Cases – 2012-2016

	Hispanic	Asian	Black	NH White
0-4	44	9	1	1
5-14	19	4	1	2
Total	77.8%	16%	2.5%	3.7%
Non-US-born	6%	31%	50%	0%
US-born	94%	69%	50%	100%

89% are US-born
vs adult TB 82% are non-US-born
TB transmission from non-US-born family



Year of TB elimination in California Extrapolation based on current rate of decline*



* Average annual decline in case rate 2005-2014

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What does elimination mean in California?

Tuberculosis	2015(Current)	Elimination by 2040	
		2040	Averted (cumulative)
Rate (case per million)	55	<1	-
Cases	2133	39	25,000
Deaths	210	4	2,500
Direct costs (2015 dollars)	\$72 Million	\$1.3 Million	>\$850 million

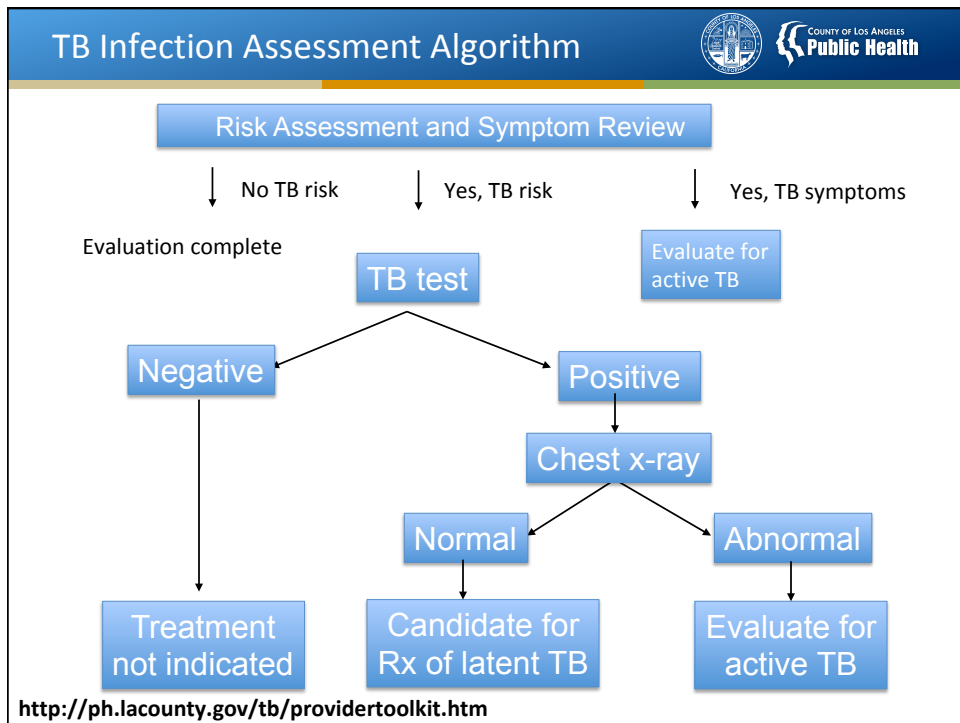
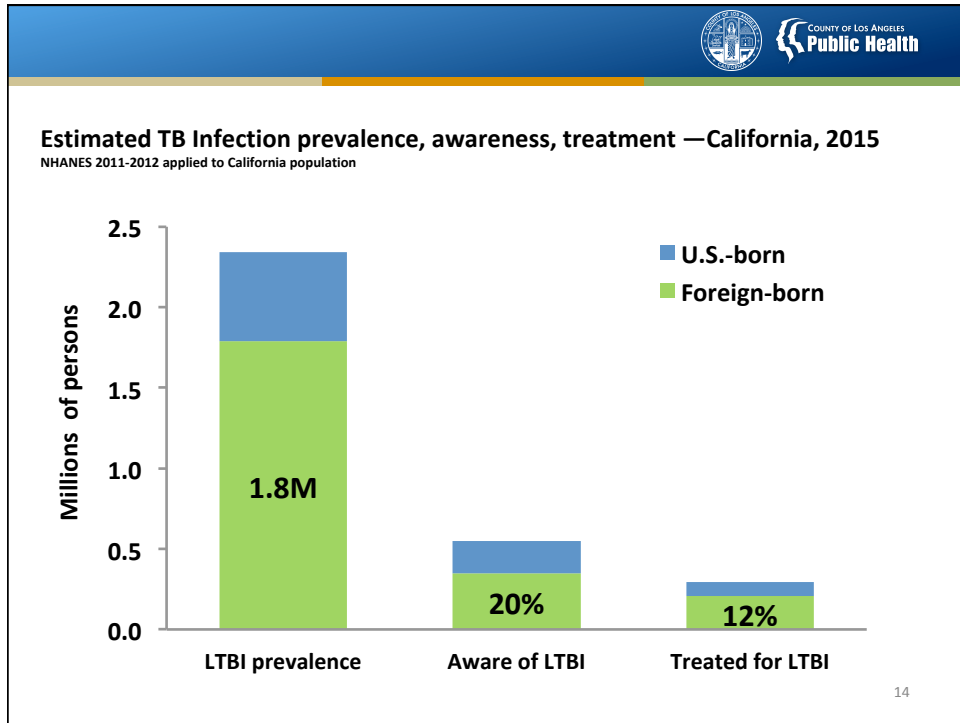
2040 cases based on 2014 US Census Estimate of California Population: 38.8 million

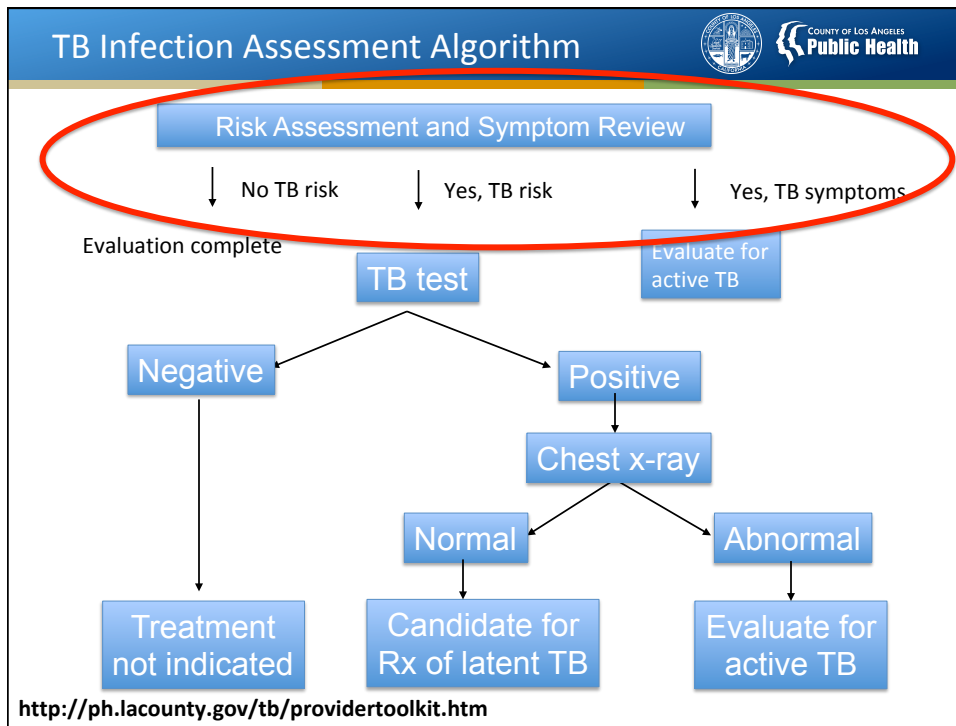
Elimination definition: WHO. Framework towards TB Elimination in Low-Incidence Countries. 2014


Deaths estimated as 10% of active cases

Direct costs estimated using average cost per case in 2015 (\$33,692). Includes only direct medical costs for case.

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Los Angeles County Pediatrics Tuberculosis Risk Assessment

TB Risk Assessment, Screening & Treatment - Provider Guidance

- 
California TB Screening Mandates for Specific Groups
- 
Risk Assessments & User Guides
- 
TB Infection Testing Information
- 
TB Infection Treatment Information




[College & University Student TB Risk Assessment and User Guide](#)



[Pediatric TB Risk Assessment and User Guide](#)

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Los Angeles County Pediatrics Tuberculosis Risk Assessment

Check appropriate risk factor boxes below.

TB infection testing is recommended if any of the 3 boxes below are checked.

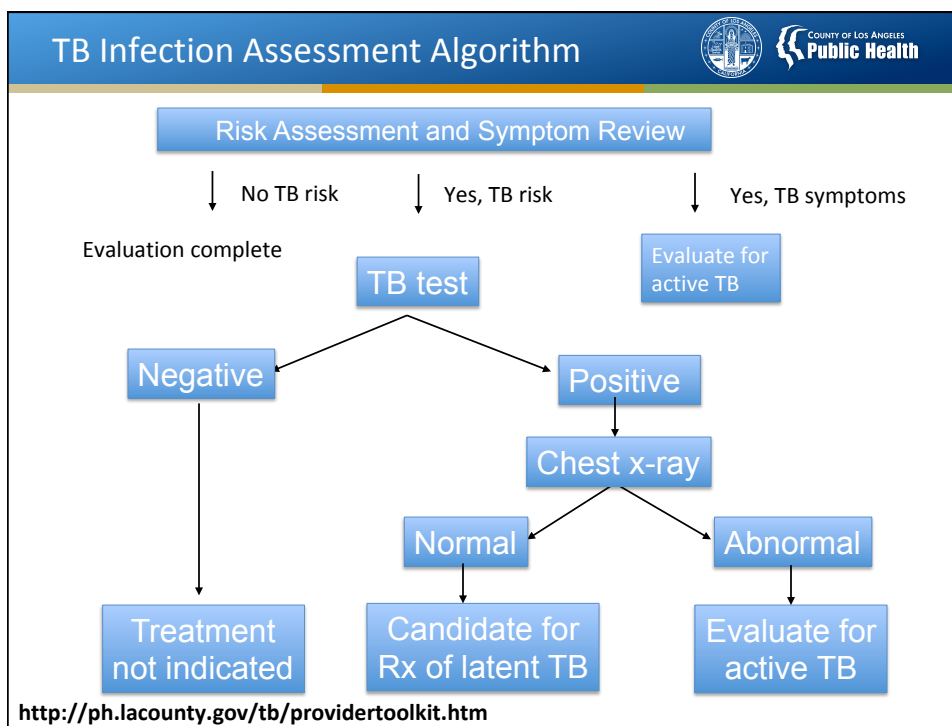
If TB infection test result is positive and active TB disease is ruled out, TB infection treatment is recommended.

- Birth, travel, or residence** in a country with an elevated TB rate for at least 1 month
 - Includes any country other than the United States, Canada, Australia, New Zealand, or a country in Western or Northern Europe
 - Interferon Gamma Release Assay is preferred over Tuberculin Skin Test for Non-U.S.-born persons ≥2 years old
- Immunosuppression, current or planned**
 - HIV infection, organ transplant recipient, treated with TNF-alpha antagonist (e.g., infliximab, etanercept, others), steroids (equivalent of prednisone ≥2 mg/kg/day, or ≥15 mg/day for ≥2 weeks) or other immunosuppressive medication
- Close contact to someone with active TB disease at any time**
 - The Centers for Disease Control and Prevention indicates that the investigation of contacts and treatment of infected contacts is an important component of the U.S. strategy for TB elimination.

- Use this tool to identify asymptomatic **children** for TB infection testing.
- Re-testing should only be done in persons who previously tested negative, and have **new** risk factors since the last assessment.

For children with TB symptoms or abnormal chest x-ray consistent with active TB disease → Evaluate for active TB disease
 Evaluate for active TB disease with a chest x-ray, symptom screen, and if indicated, sputum AFB smears, cultures and nucleic acid amplification testing. A negative tuberculin skin test or interferon gamma release assay does not rule out active TB disease.
 Do not treat for TB infection until active TB has been excluded.

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Red Book 2018 | Childhood TB Infection

- The recommended age for use of IGRAs for the diagnosis of TB has been decreased to 2-years-old.
- For preventive treatment of TB infection, there are now **three options** offered:
 - **3HP** = 12 weeks of once-weekly, high-dose INH + rifaPentine [**≥2-years-old and up**]
 - **4R** = 4 months (120 doses) of once-daily Rifampin
 - **9H** = 9 months (270 doses) of once-daily INH
- Recommended rifampin dose is now $\geq 15\text{mg/kg}$, regardless of indication.

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Key points about IGRAs



- A negative IGRA does not rule out TB disease
- IGRA results are dependent upon specimen handling
- Even with good specimen handling, IGRA results can be variable -
 - Serial testing in healthcare workers (considered low risk) 6-8% conversion with IGRA, 75% reverted upon repeat testing. Dorman et al., AJRCCM 2014.
- IGRA performance in pediatric population is reliable
 - 3 year cohort of children < 15 followed, IGRA in BCG vaccinated children predicted nonprogression to TB disease without treatment after > 5 years of follow up (Grinsdale, et al., JPID, 2014)

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Red Book 2018 | Childhood TB Infection



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MMWR: Update of Recommendations for Use of Once Weekly INH-RFP Regimen to Treat LTBI



COUNTY OF LOS ANGELES
Public Health

- **Children**
 - Non-inferior to 9 months of INH
 - 3HP now recommended for use in children ages 2-17 years old
- **Self-administered therapy (SAT)**
 - Completion rates: SAT 78% vs. DOT 85% (non-inferior)
 - 3HP can now be administered by SAT or DOT in people > 2 years old, depending upon local practice and the patient
- **HIV**
 - Non-inferior to 9 months of INH
 - 3HP may now be administered with select compatible ARV regimens

Villarino E, et al., *JAMA Pediatrics*, Jan 2015
 Belknap R, et al., *Ann Intern Med*. November, 2017
 Sterling T, et al., *AIDS*, Jun, 2016
 MMWR, June 29, 2018, 65(27);723-726

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COUNTY OF LOS ANGELES
Public Health

INH-RPT (3HP)

- **Advantages:**
 - Less hepatotoxicity (~ 7x less than INH)
 - Greater adherence (82% INH-RPT vs. 69% INH)
- **Disadvantages:**
 - Multiple drug interactions
 - Pill burden
 - Flu-like syndrome (2.2%)

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Summary

- Los Angeles County has a high burden of TB
- Most pediatric cases in LA County represent transmission in the county and are considered preventable cases
- Increases in treatment of pediatric TB infection by as little as 2-4 fold will accelerate TB elimination and bend the curve for LA County!
- IGRA performs well in the pediatric population at risk
- Rifamycin based regimens have higher completion rates than INH

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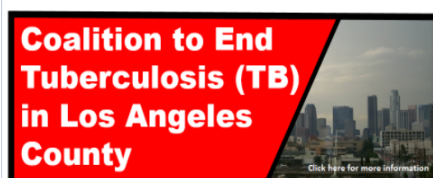
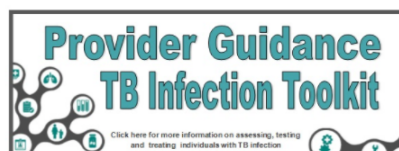
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<http://publichealth.lacounty.gov/tb/>



Thank you! Join our Coalition!



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**→ END
TB**

WORLD TB DAY
MARCH 24



- Rx for Prevention
 - <http://rx.ph.lacounty.gov/RxTB0517> - Free CME!
- Join the TB coalition
 - <http://publichealth.lacounty.gov/tb/coalitiontoendtb.htm>
- LA County TB infection toolkit for providers
 - <http://publichealth.lacounty.gov/tb/providertoolkit.htm>