

Impact of the 2007 TB Technical Instructions and EDN

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TB and Immigrants/Refugees

- 2007:
 - 13923 Active TB Cases in USA
 - 57.8% Foreign Born
 - Rate of TB in Foreign Born is 10 fold greater than in US born
 - 20.6 vs 2.1 /100 000
 - 27.5% TB cases in Foreign Born persons diagnosed within 2 years of US arrival

NEJM 360:23 june 2009, Y Liu et al

Overseas TB Screening

- Medical Examination Overseas
- US Embassies and Consulates appoint Panel MDs
 - US DOS sponsors the refugees /exams
 - Immigrants are self pay
- Goal is to reduce importation of active TB (and other diseases) and transmission

Medical Examination

- Part 34 [(42 CFR 34.3(b)(v)]
 - Tuberculosis screening required for applicants for U.S. immigration
 - CDC-Division of Global Migration and Quarantine (DGMQ) develops Technical Instructions, the components of the examination



Medical Examination

- Overseas
 - Immigrant visa applicants
 - Immigrants and refugees
 - FY 2008: 466,558 immigrants
61,498 refugees
 - Performed by panel physicians
 - Offered agreements by Department of State
- Domestic
 - Status adjuster applicants
 - Immigrants
 - FY 2008: 640,568 immigrants
 - Performed by civil surgeons
 - Appointed by United States Citizenship and Immigration Services (USCIS), Department of Homeland Security (DHS)



CDC



1991 Tuberculosis Technical Instructions: for applicants ≥ 15 years of age



Valid for travel
within 6 months

Sputum smears x 3

All (-)

(at least one +)

Noninfectious
Class B1

B2 and B3

Infectious
Class A

Treat until
smear negative

Class A
waiver



CDC



Post US Arrival Evaluation

- At US Port of entry:
 - DS forms 2053,3024-26
 - Taken by the DHS /INS officer and sent to local CDC quarantine station (or EDN CDC)
 - Sent to Local Health dept (you've got email)
 - Contact and Evaluate the newly arrived person with a class B Tb condition
 - PHD returns CDC from 75.17(you send email)

Review of US bound Immigrants and Refugees 1999 -2005

- 2.7 Million Immigrants
- 26075 Smear Negative Active Tb (Class B1)
 - 961/100 000
 - Active TB in 7%
- 22716 Smear Negative Inactive Tb(Class B2)
 - 837/100 000
 - Active TB in 1.6%
- 378506 US bound refugees
 - 3923 B1 – 1036/100 000
 - 10743 B2 – 2838/100 000

NEJM 360:23 june 2009, Y Liu et al

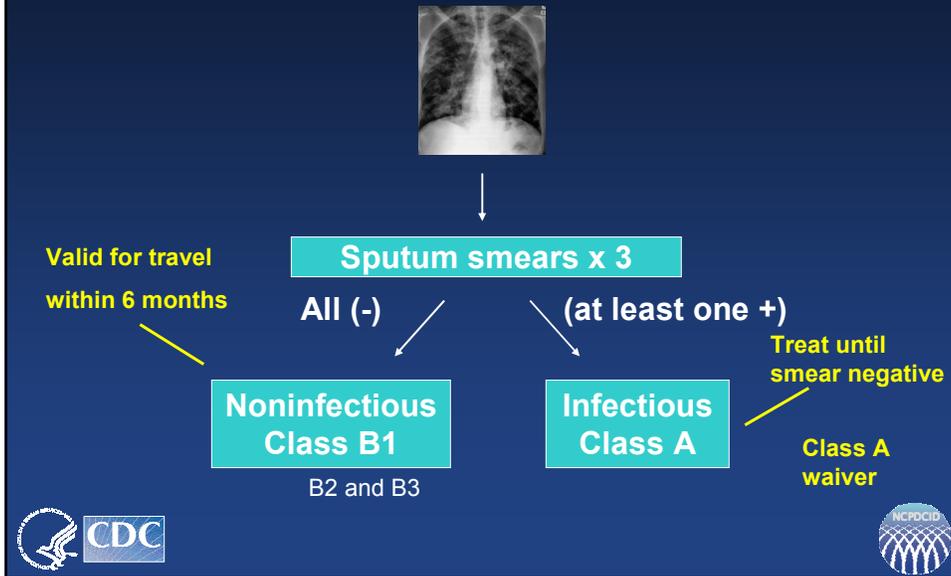
Notable Results from the 1999 -2005 Data review

- 25.6% US bound persons from Western Pacific region
 - 91.1% B1 and 70.4% B2
- 41% from RPI, VN, China, Mexico, India
 - Represent 95% B1 and 67% B2
- 7.6% US bound Refugees from Western Pacific Region
 - 41% B1 and 12% B2
- 45% Refugees Ukraine, VN, Somalia, Sudan, Bosnia Herzegov
 - 58% B1 and 69% B2

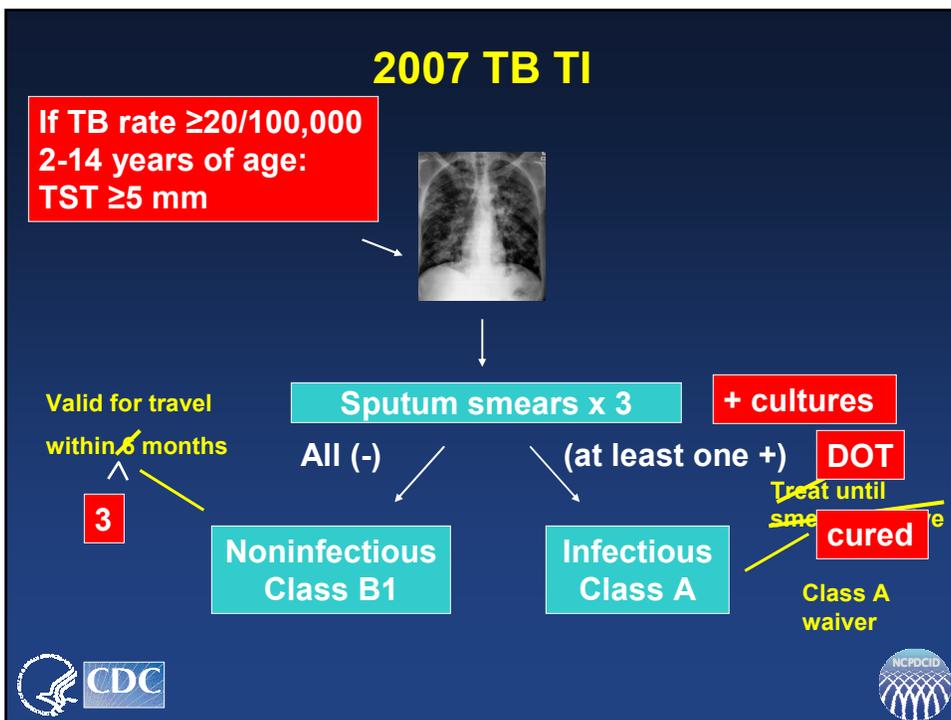
Results of Post USA Arrival Evaluation

- Median time from Screening to Arrival = 83 days
- Median time from arrival to F/U = 53 days (Immig)
- Median time from arrival to F/U = 47 days (refugee)
- **Active TB post arrival:**
 - 6.9% B1 IM and 7.7% R
 - 1.4% B2 IM and 1.8% R
- **26 - 36% of US bound persons with a B1 or B2 classification did not have any evidence of TB**
- 3.3-14.8% B1 and 0.4 -4.3% B2 from prior studies in the literature

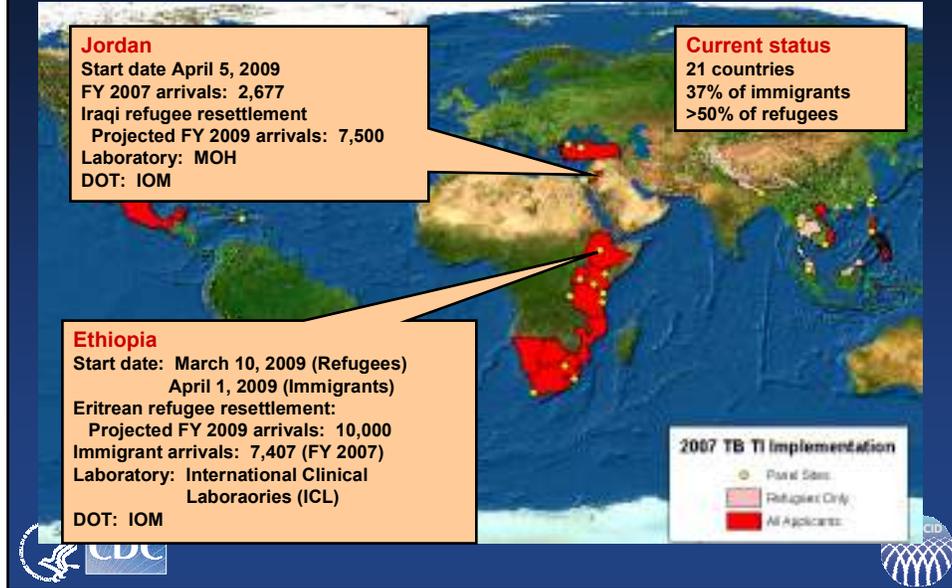
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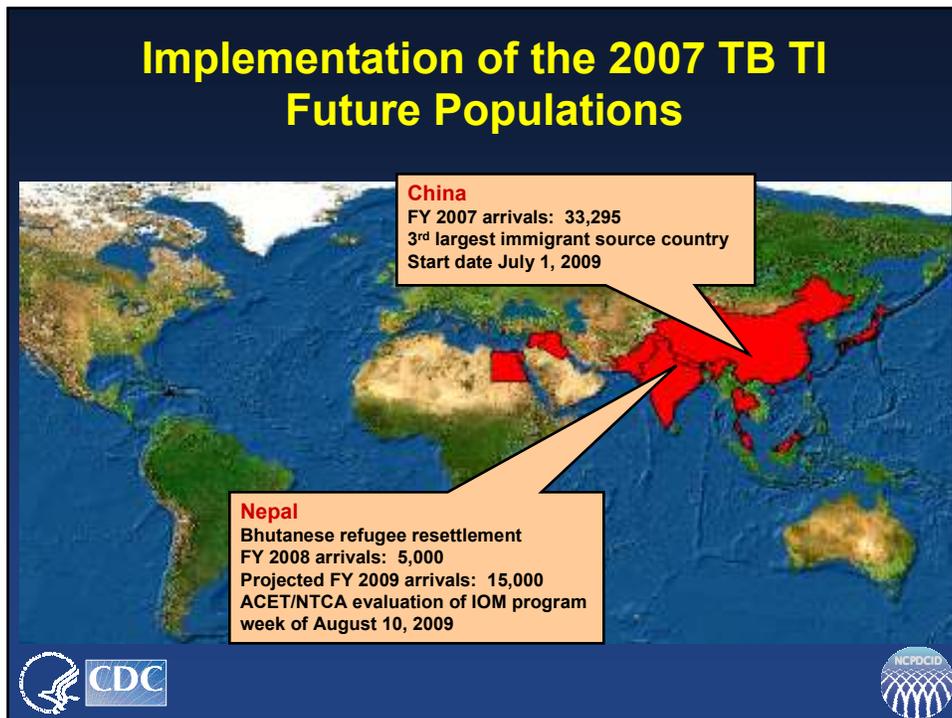
2007 TB TI



Implementation of the 2007 TB TI Current Status



Implementation of the 2007 TB TI Future Populations



New DS Forms

- DS Forms are the paperwork completed by panel physicians
- Update to incorporate changes from 2007 TB TI
- Undergoing Department of State review process
- Implementation targeted for
 - October 1, 2009
 - Contingent upon
 - Update of Electronic Disease Notification (EDN)
 - Update of EDN –IOM electronic interface for refugee medical examinations

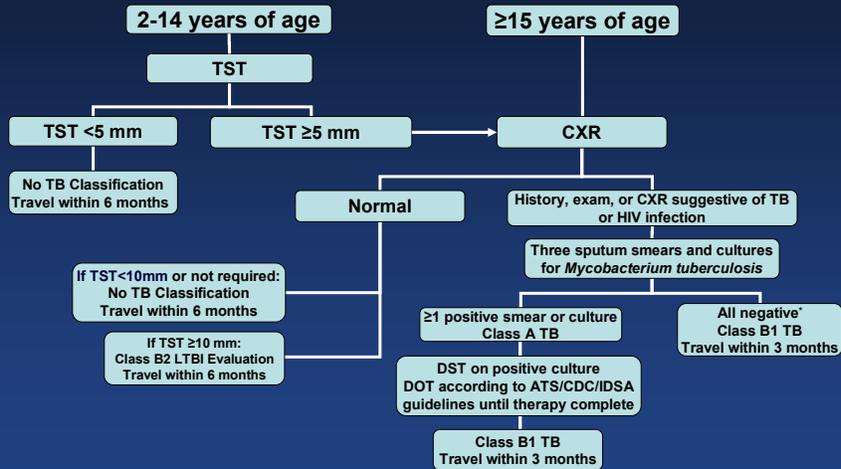


2007 Technical Instructions: Classifications

Class	1991 Technical Instructions	2007 Technical Instructions
No classification	Normal evaluation	Normal evaluation
Class A	Tuberculosis disease	Tuberculosis disease
Class B1- Pulmonary	Abnormal CXR, sputum smears negative	Abnormal CXR, sputum smears and cultures negative
Class B1 – Extrapulmonary	Extrapulmonary tuberculosis	Extrapulmonary tuberculosis
Class B2	Inactive tuberculosis on CXR	LTBI evaluation
Class B3	Old or healed tuberculosis	Contact evaluation



2007 Technical Instructions WHO Incidence $\geq 20/100,000$

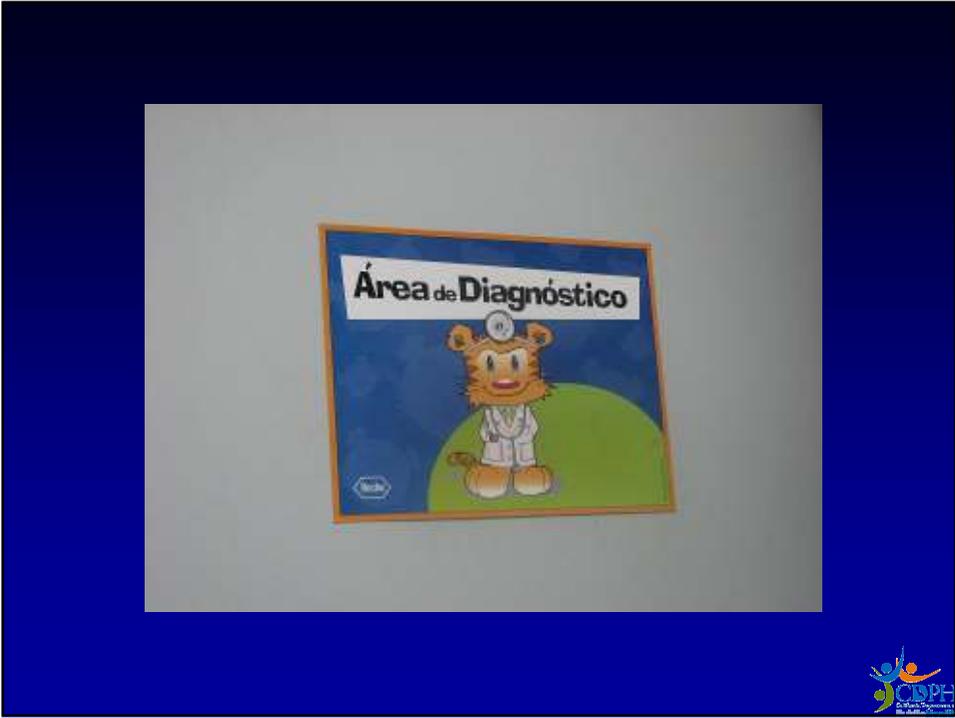


CDC

Applicants with HIV infection who have a negative evaluation are Class A for HIV and No TB Classification for tuberculosis and must travel within 3 months















Civil Surgeon TB TI



Civil Surgeon Examinations

- New TB TI became effective May 1, 2008
- Important changes
 - Formally require tuberculosis cultures
 - Updated guidance regarding latent *Mycobacterium tuberculosis* infection (LTBI)



EDN update

Recent activities in California:

- EDN web-based system launch in California 10/1/08
- 16 LHDs currently using the web-based system, remaining 45 LHDs using paper-based system
- Provide training and support to local health departments (LHDs)
- Develop data quality control system
- Manage and analyze EDN data
- Monitor TB cases reported among B-notification arrivals
- Feed information about EDN and the 2007 Technical Instructions back to CDC



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EDN update (2)

Next steps:

TBCB

- Implement the EDN web-based system at additional California LHDs
- Provide summary reports of California EDN data to LHDs

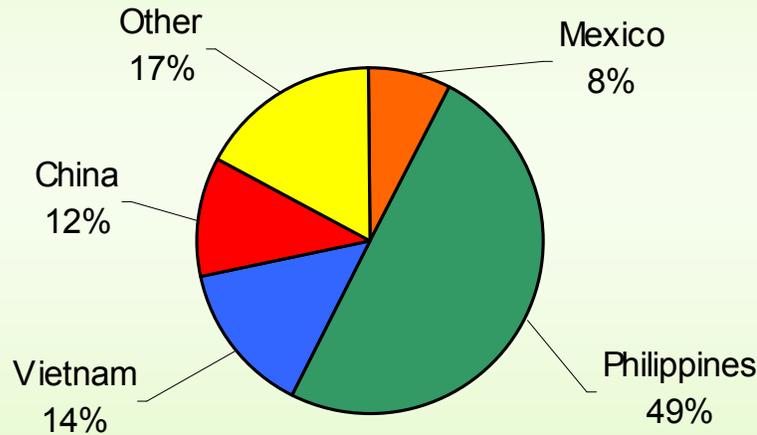
CDC

- Improve timeliness of notifications about new B-notification arrivals
- Implement EDN reports to provide summary data and stimulate reporting
- Provide summary reports of national trends in B-notification arrivals



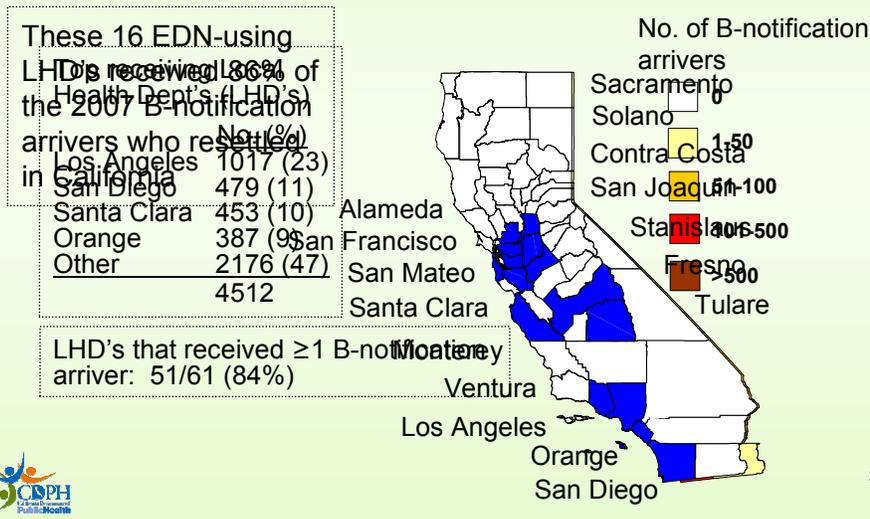
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Country of Origin of California B-notification arrivers in 2007 (n=4512)



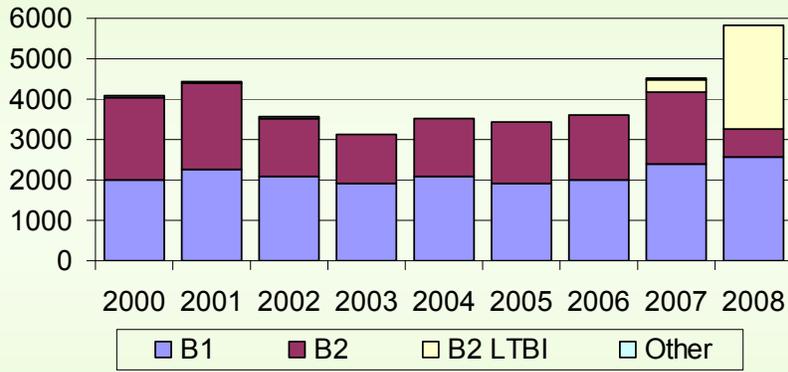
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Where did California B-notification arrivers settle in 2007?



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California B-notification arrivers by B class 2000-2008

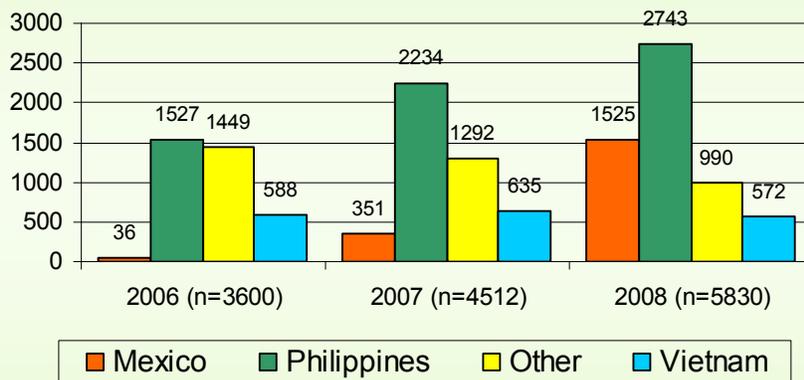


Percent of total US-bound B-notification arrivers who resettled in California in 2007: $4,512/12,475^* = 36\%$



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California B-notification arrivers by country of origin 2006-2008

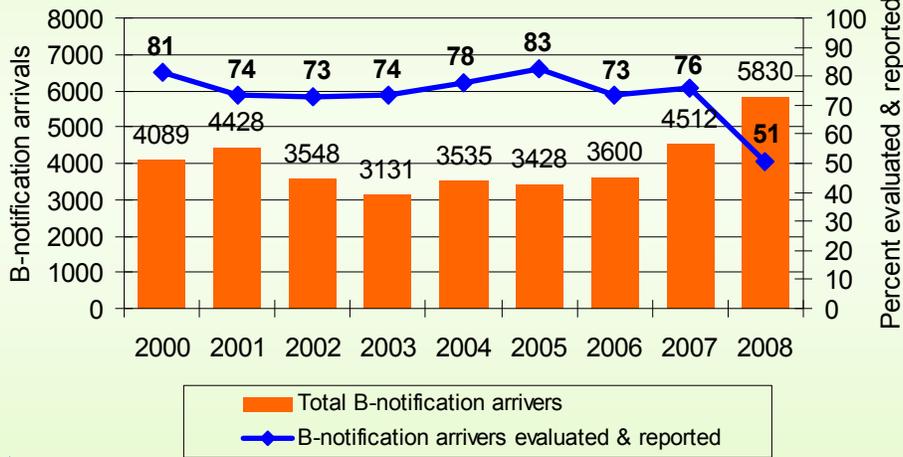


- **Large** increase in number of arrivers from Mexico
- Increase in arrivers from the Philippines



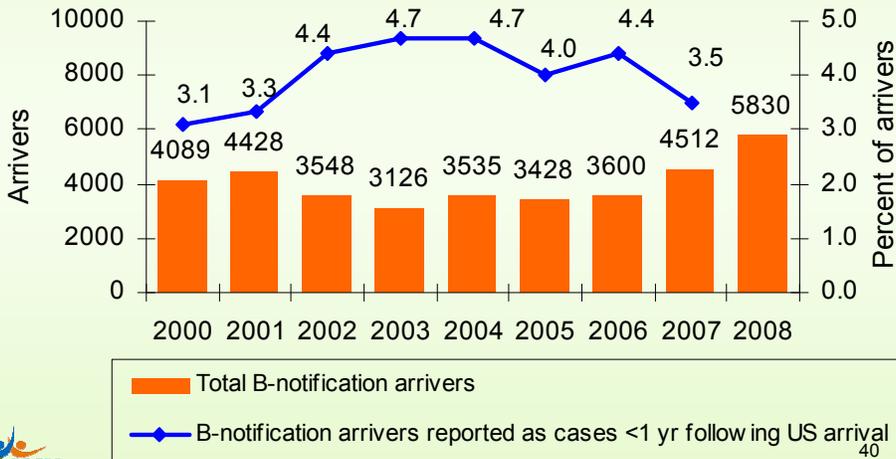
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Percent of California B-notification arrivers evaluated and reported 2000-2008



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Percent of California B-notification arrivers reported as cases ≤ 1 year after US arrival 2000-2007



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Methods

Chose two comparison groups based on:

- (1) Country of origin
- (2) Date of pre-immigration screening

Country of Origin	Cohort A (1991 TI's)	Cohort B (2007 TI's)
Mexico or Philippines	10/1/06-9/30/07	10/1/07-9/30/08
Vietnam	2/1/07-9/30/07	2/1/08-9/30/08



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Methods (2)

Data sources:

- Report of Verified Case of Tuberculosis (RVCT)
- Information on Migrant Populations (IMP) database

Analysis:

- Matching: RVCT and IMP datasets were matched to allow for inclusion of cases reported via either reporting mechanism
- Case inclusion: active TB cases reported by state case registry (RVCT) or by the (EDN worksheet) ≤6 months after US arrival date



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III. Compare frequency and characteristics of TB cases reported among California B-notification arrivers who were screened using the two pre-immigration systems



Comparison groups of B-notification arrivers

Cohort A: 1991 TI
B-notification arrivers

Country of Origin	
<u>Origin</u>	<u>n (%)</u>
Mexico	152 (7)
Philippines	1685 (80)
Vietnam	278 (13)
Total	2115

Cohort B: 2007 TI
B-notification arrivers

Country of Origin	
<u>Origin</u>	<u>n (%)</u>
Mexico	1363 (37)
Philippines	2143 (58)
Vietnam	165 (4)
Total	3671



B-notification arrivers from Mexico

	Cohort A 1991 TI		Cohort B 2007 TI	
	#	%	#	%
B1	141	93	182	13
B2	11	7	na	--
B2 LTBI	na	--	1181	87
Total	152		1363	

- 800% increase in total number of B-notification arrivers from Mexico



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B-notification arrivers from the Philippines

B class	Cohort A 1991 TI		Cohort B 2007 TI	
	#	%	#	%
B1	1078	64	1149	54
B2	607	36	na	--
B2 LTBI	na	--	994	46
Total	1685		2143	

- 27% increase in total number of B-notification arrivers



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B-notification arrivers from Vietnam

	Cohort A 1991 TI		Cohort B 2007 TI	
	#	%	#	%
B1	229	82	147	89
B2	49	18	na	--
B2 LTBI	na	--	18	11
Total	278		165	



• 41% decrease in total number of B-notification arrivers⁴⁷

Cohorts A and B: B-notification arrivers and TB cases[†] reported by country of origin

Arriver country of origin	Cohort A	Cohort B
	1991 TI No. (%)	2007 TI No. (%)
Mexico (A=152, B=1363)	2 (1.3)	2 (0.1)
Philippines (A=1685, B=2143)	66 (3.9)	26 (1.2)
Vietnam (A=278, B=165)	19 (6.8)	4 (2.4)
Total	87 (4.1)	32* (0.9)

* $p < 0.01$



[†]Cases reported ≤ 6 months following US arrival date

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TB cases reported among cohorts A and B by B classification

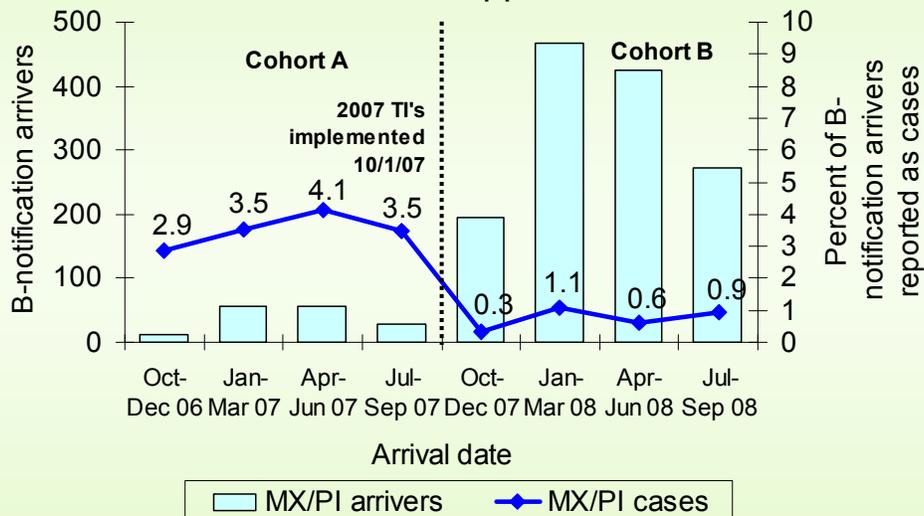
	Cohort A 1991 TI	Cohort B 2007 TI
B class	No. (%)	No. (%)
B1	75 (5.1)	26* (1.8)
B2	12 (1.8)	na
B2 LTBI	na	6 (0.3)
Total	87	32

*($p < .01$)



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TB cases reported among B-notification arrivers from Mexico and the Philippines 10/1/06-9/30/08



*Significant *downward* trend in cases among B-notification arrivers during this time period ($p < 0.1$)



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Conclusions

- Improving timeliness of notifications about new arrivers is crucial to California users and will likely stimulate reporting
- Preliminary data suggest that the 2007 TI's have been effective at reducing the importation of TB among California B-notification arrivers



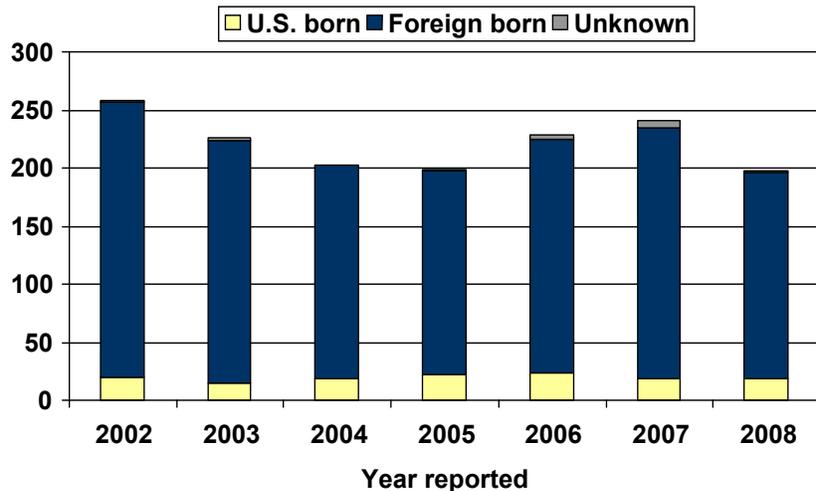
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EDN and the NEW TB TIs from a TB and
Refugee Clinic Perspective
HELP or HINDRANCE?

The SCC Experience



TB Cases by U.S.- and foreign-born in SCC, 2002-2008



Source: SCCPHD

Santa Clara County Tuberculosis Clinic and Refugee Health Assessment Program

- Stand alone subspecialty clinic--part of Ambulatory Care in the SCCHHS in 1994
 - Avg. 475 Class B Immigrants yearly
 - Avg. 500 Refugees and Asylees yearly
 - 125-175 Active TB cases yearly
 - 1000-1500 Patients starting LTBI yearly
 - Adjustment of status with abnormal films
 - Evaluation of pts. with abnormal. films
 - Inpatient TB consult service SCVMC
 - 26,000 patient visits a year

TB Clinic-1994

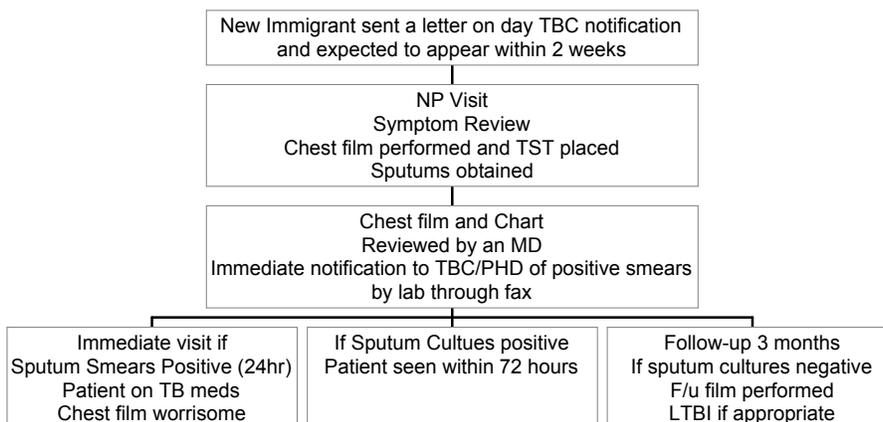
- 2 filing cabinets with Class B notifications
- Letters sent to patients asking them to come to TBC

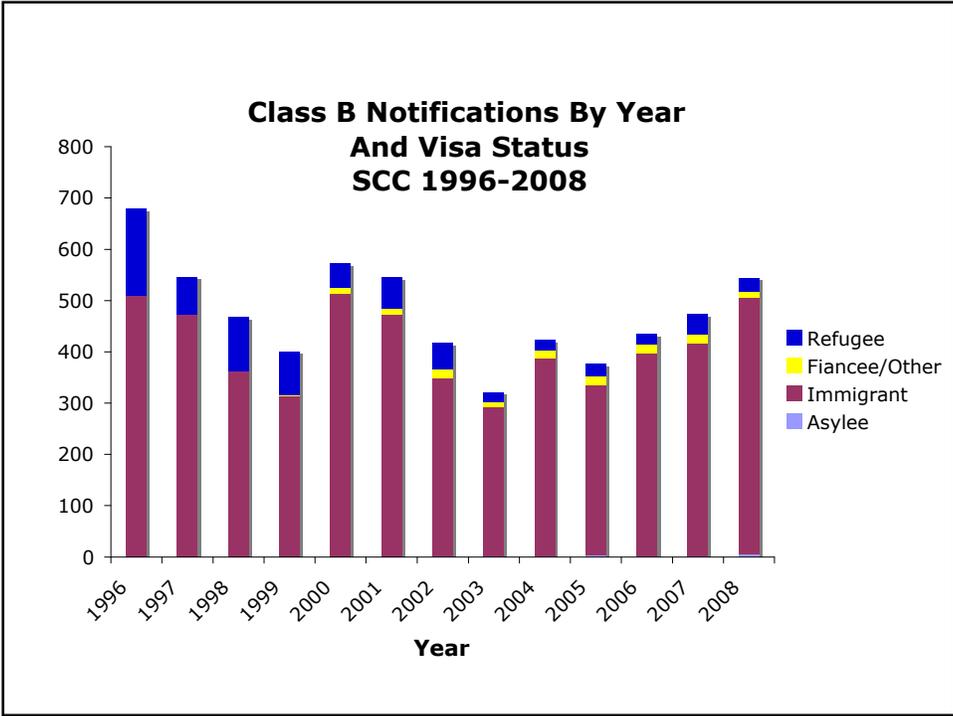
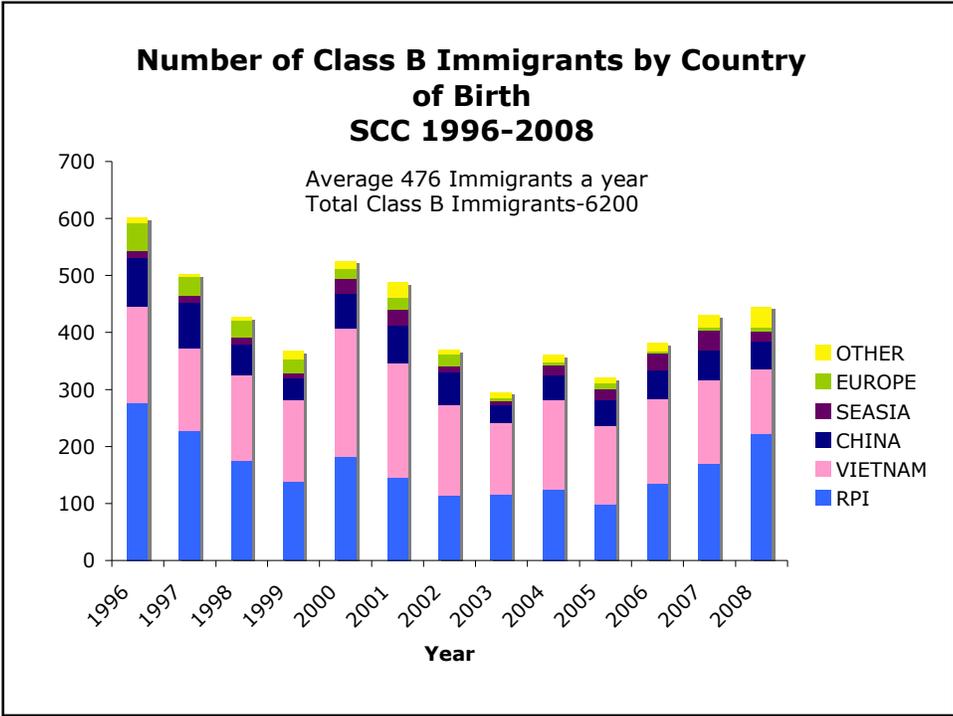
Letter

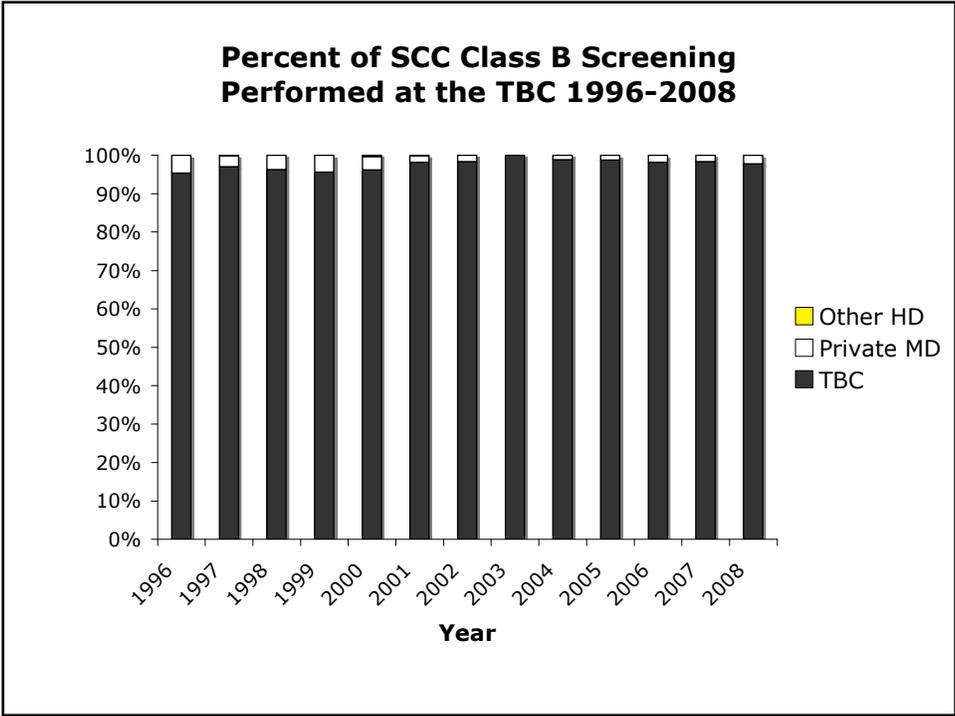
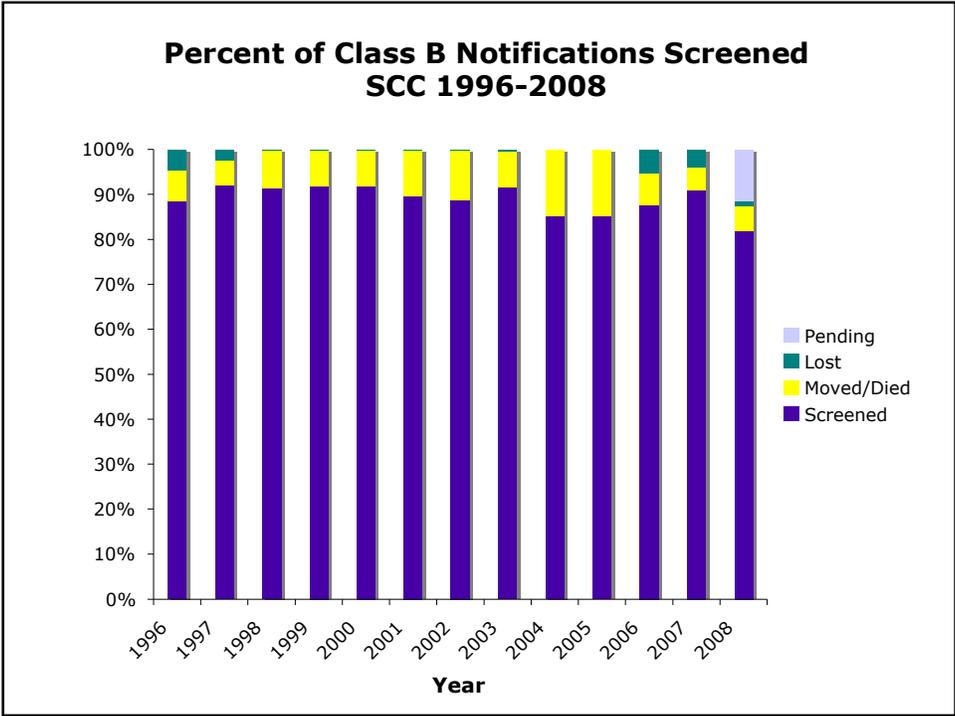
At the time of your visa examination in your native country, you were identified as having evidence of tuberculosis. Now that you have arrived, a medical examination **MUST** take place to find out whether you have active tuberculosis and whether you need any further treatment.

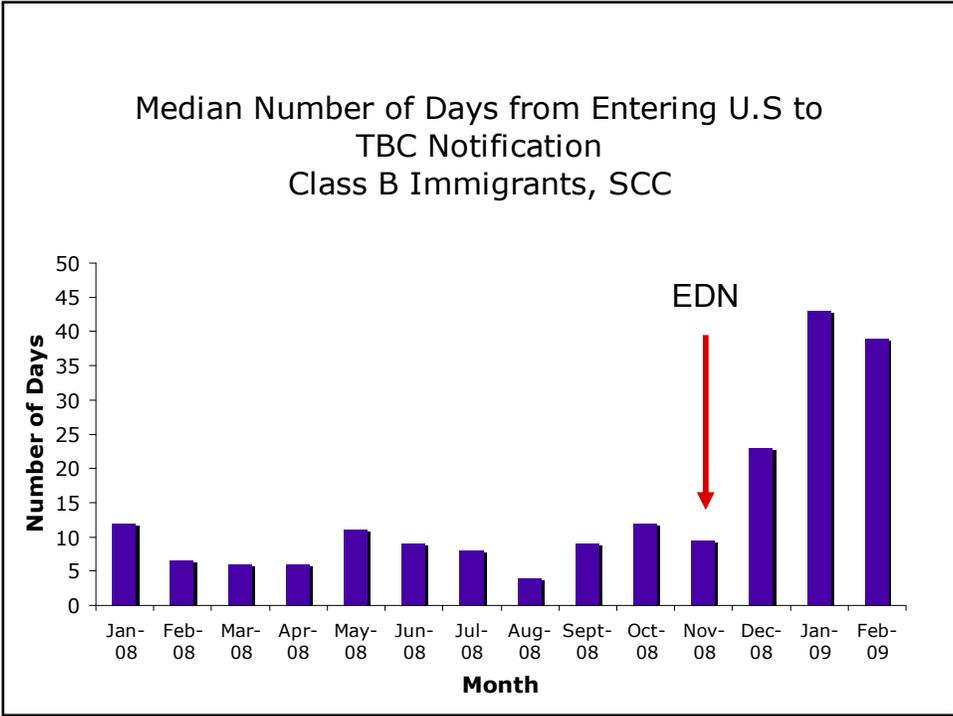
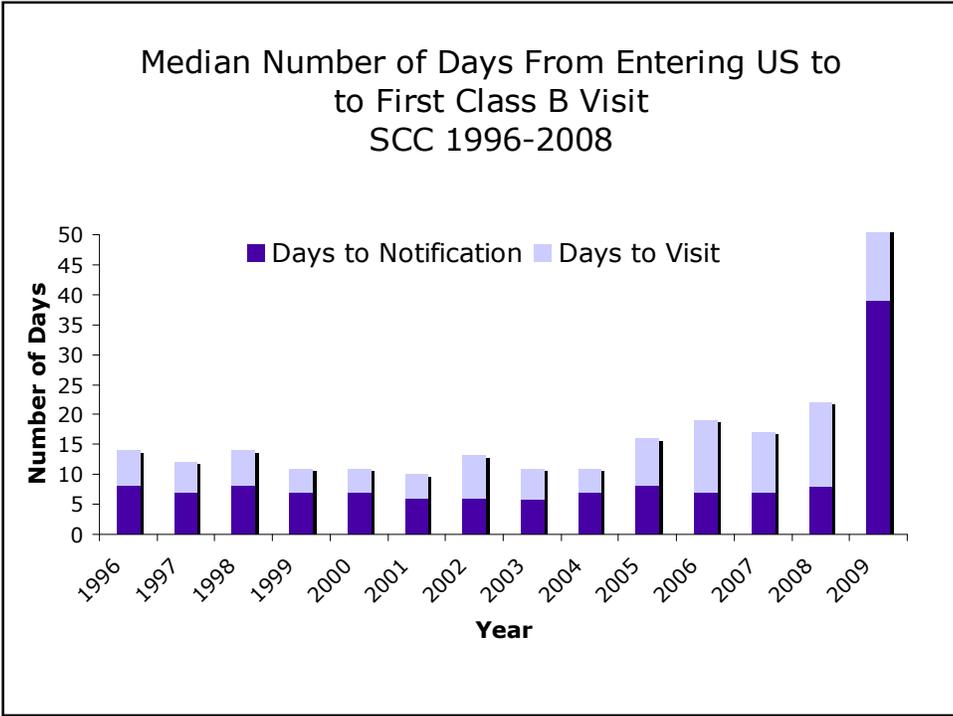
If we do not see you in the clinic within two weeks of sending this notice to you, we will return your papers to the authorities confirming your failure to report to the TB Clinic as required.

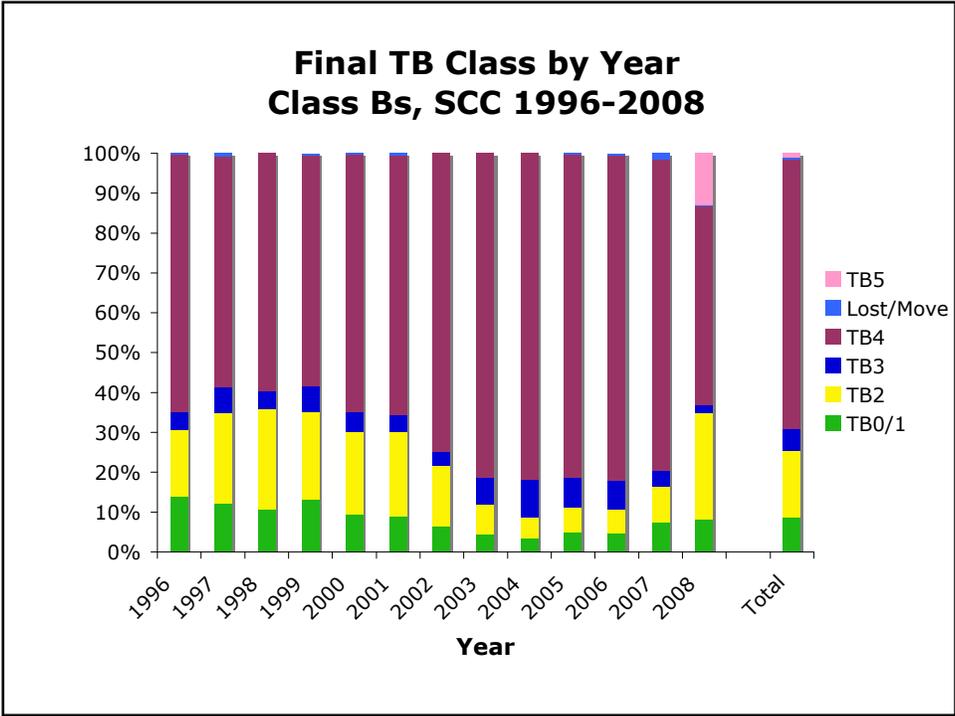
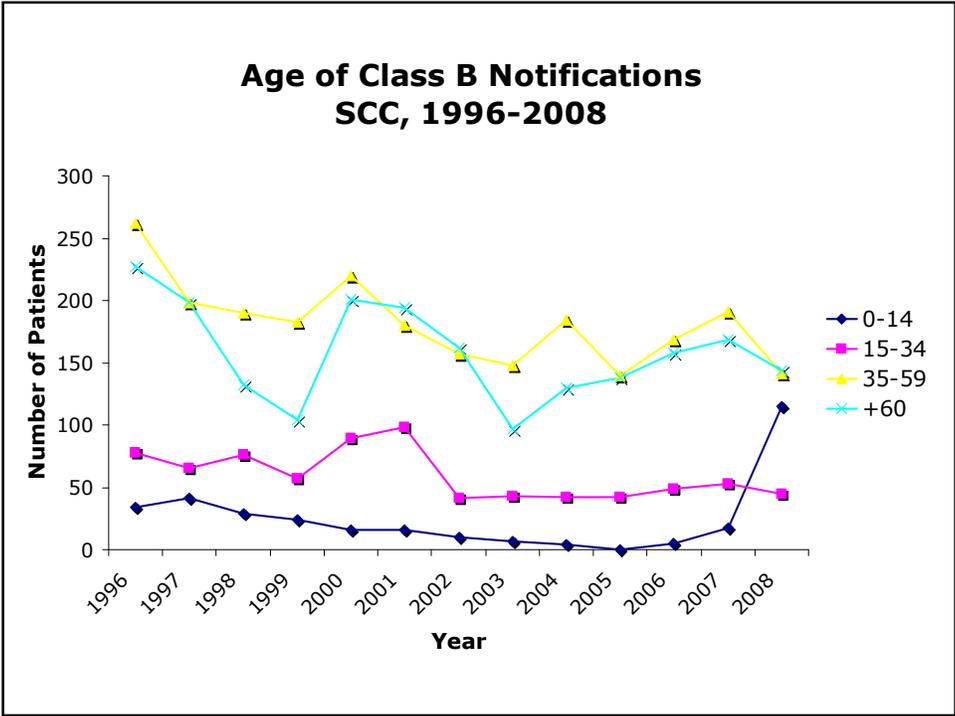
Class B Screening Process

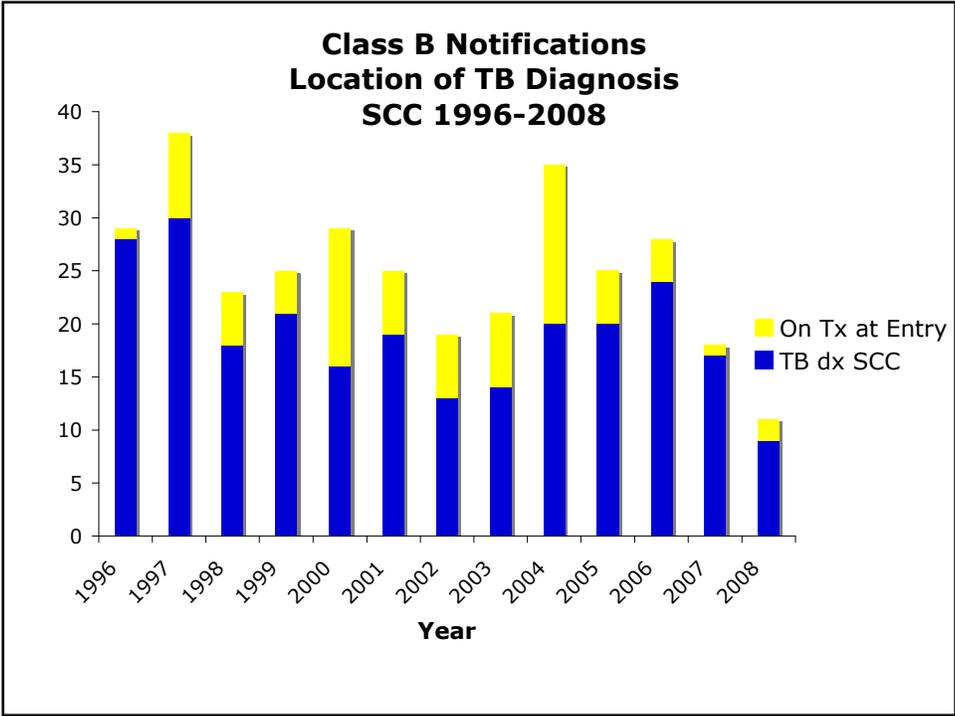
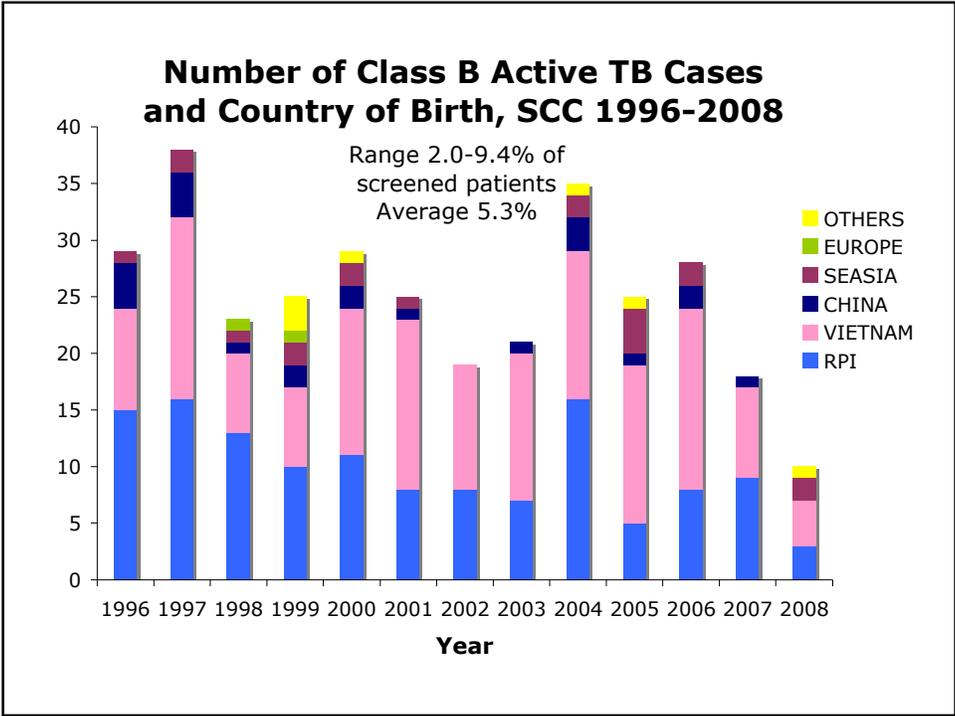


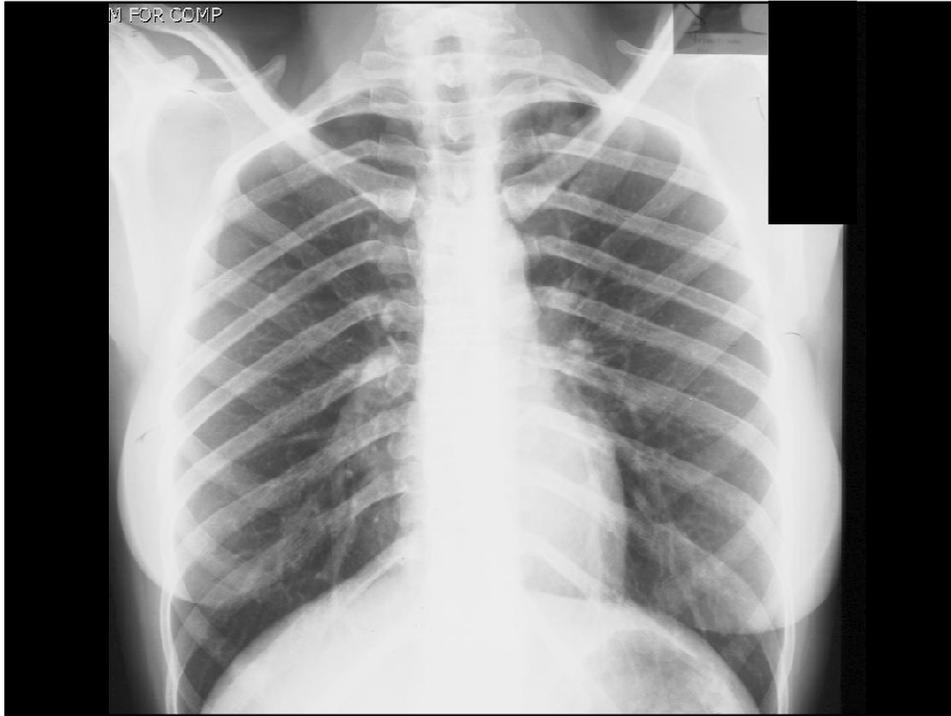












Refugee and Asylee Screening-SCC Data

- 35% of refugees with an abnormal preimmigration chest films are assigned class B status
 - 90+% of refugees screened in SCC
- 0% of asylees granted asylum outside of the U.S. with an abnormal film are class B
 - Difficult group to screen in our county
 - Now up to 50% with increased outreach

Active TB Cases Refugees and Asylees 2005-2008

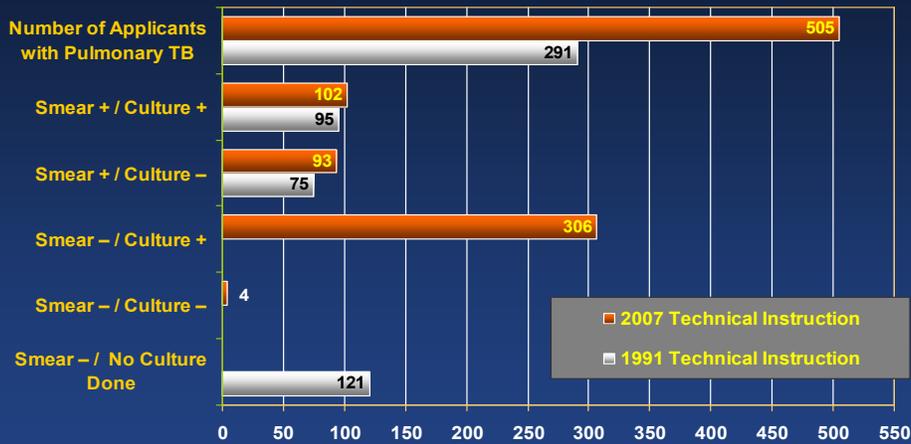
Visa Class	TB cases Diagnosed in U.S.	Total Number screened	Cases/ 100,000 population
Refugees	4	1626 (911*)	246 (439*)
Out of U.S. Asylees**	1	114	877
In U.S. Asylees	3	44	6818

*Refugees from Africa and Asia **Most common countries of birth are China and India

Conclusions

- Time to EDN notifications is longer than paper notifications
 - This may lead to increased loss of patients
- Downloading notifications takes time
- 3 pages of paperwork to fill out in clinic
 - In place of a 1/2 page form
- Increase in clinic workload due to new class B2 - LTBI category
- Decreased active TB cases diagnosed in U.S.
 - We are interested in f/u of cases treated overseas
 - How well are the pts treated and how robust is their lab support
 - Will there be a gradual increase in drug resistant cases found in the USA in immigrants treated prior to immigration?
- There are holes in assigning class B status to refugees and asylees

**Saint Luke's Extension Clinic (SLEC)
FY 2007 (52,530 applicants, 1991 TB TI) vs.
FY 2008 (41,793 applicants, 2007 TB TI)**



TB case detection rate 1991 vs 2007 TB TI: 554 vs. 1,208 (per 100,000)



**SLEC Drug Susceptibility Testing
October 1, 2007 through September 30, 2008
N=408 Culture Positive Applicants**

Resistance pattern	N (%)
Pansusceptible	289 (71)
INH monoresistance	38 (9)
RIF monoresistance	2 (0)
MDR TB	12 (3)
Polyresistant but not MDR TB	9 (2)
Monoresistant but not to INH or RIF	20 (5)
No DST result	38 (10)
Total	408 (100)



SLEC Treatment Outcome October 1, 2007 through September 30, 2008 N=505 Pulmonary Tuberculosis Applicants

Outcome	N (%)
Ongoing treatment	51 (10)
Completed	34 (7)
Cured	321 (64)
Failed	0
Defaulted	15 (3)
Died	1 (0)
Transferred out	10 (2)
Did not register	73 (14)
Total	505 (100)



Acknowledgements

- Drew Posey and Phil Lowenthal
 - For all their slides
- Andrea Polesky and Kim Dang
 - For making nice graphs out of my best idea yet
- Marissa Ramos and Carlos Zavala
 - For making me give this talk
- CDC
 - For EDN and ruining my class b process
 - Oops EDN is down.. So will have to send this message by morse code!

