

# *San Francisco TB Control Annual Update*

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## *TB Control Goals*

- Find and treat all cases to completion
- Stop transmission
- Prevent TB in those at greatest risk of developing disease

## *Objectives*

- To share the epidemiology of TB and LTBI in San Francisco
- To highlight specific TB control activities
- To share progress made on specific goals and objectives

## *Why Review Our Data?*

- To tailor prevention and control efforts
- To identify areas of program strength and opportunities for improvement

# *San Francisco Demographics*

- Population: 810,078 (2008)<sup>1</sup>
- 35.7% foreign born<sup>2</sup>
- 27,000 living with AIDS (2007)<sup>3</sup>
- 6,000 homeless (1,500 in shelter)<sup>4</sup>  
(10.5% HIV+<sup>5</sup>, 7% LTBI by QFT-G)
- 18,000+ injection drug users  
(22% HIV+)
- ~55,000 jail bookings each year<sup>6</sup>

<sup>1</sup>State of California, Department of Finance, *Race/Ethnic Population with Age and Sex Detail, 2000–2050*. Sacramento, CA, July 2007.

<sup>2</sup>U.S. Census Bureau, *2005-2007 American Community Survey*.

<sup>3</sup>San Francisco Department of Public Health, HIV Epidemiology Section, *HIV/AIDS Epidemiology Annual Report 2007*.

<sup>4</sup>San Francisco Human Services Agency, *San Francisco 2007 Homeless Count Final Report*.

<sup>5</sup>Robertson MJ, Clark RA, Charlebois ED et al. HIV seroprevalence among homeless and marginally housed adults in San Francisco. *Am J Public Health* 2004; 94: 1207–1217.

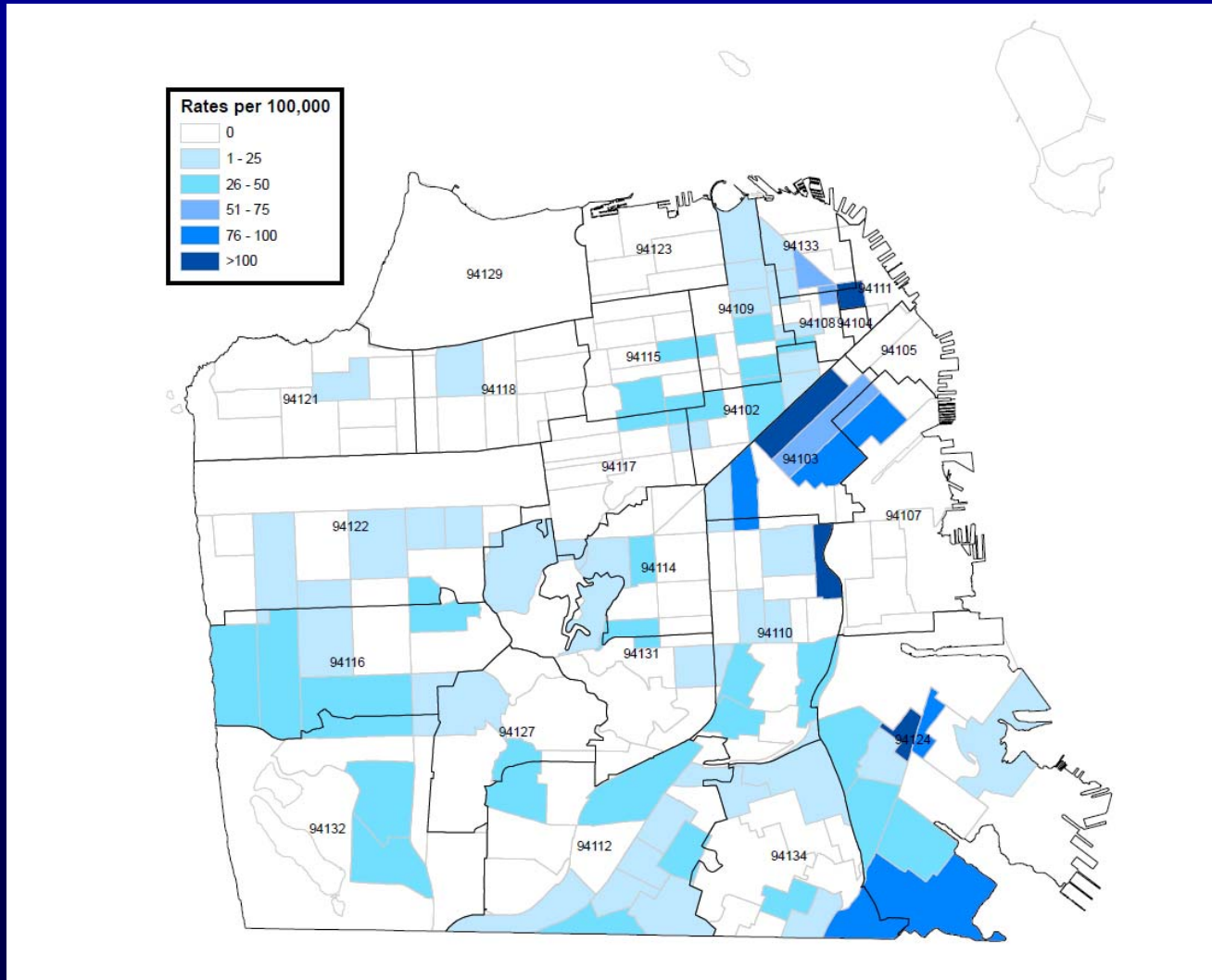
<sup>6</sup><http://www.sfsheriff.com/jails.htm>

# *Epidemiology of Active TB*

## *2008 TB Case Rates (1)*

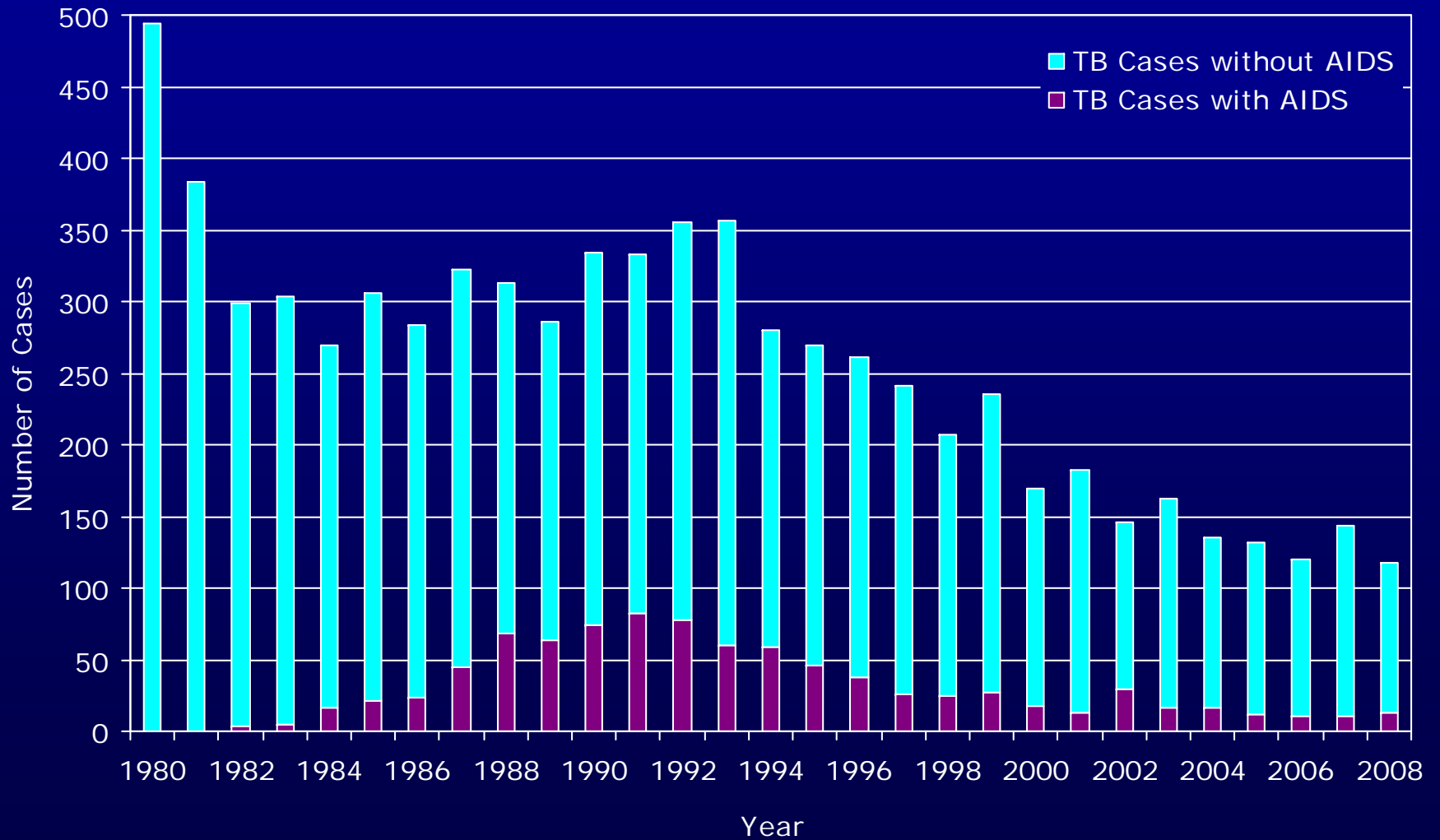
- 118 new cases reported –
  - 17.5% decrease from 2007
- Incidence rate = 14.6/100,000
- Incidence declined 50% over last decade
- Highest rate of TB in California
  - >2x California rate of 7.0/100,000
  - >3x U.S. rate of 4.4/100,000
- Cases remain concentrated in Chinatown and the TL/SOMA

# 2008 TB Case Rates (2)

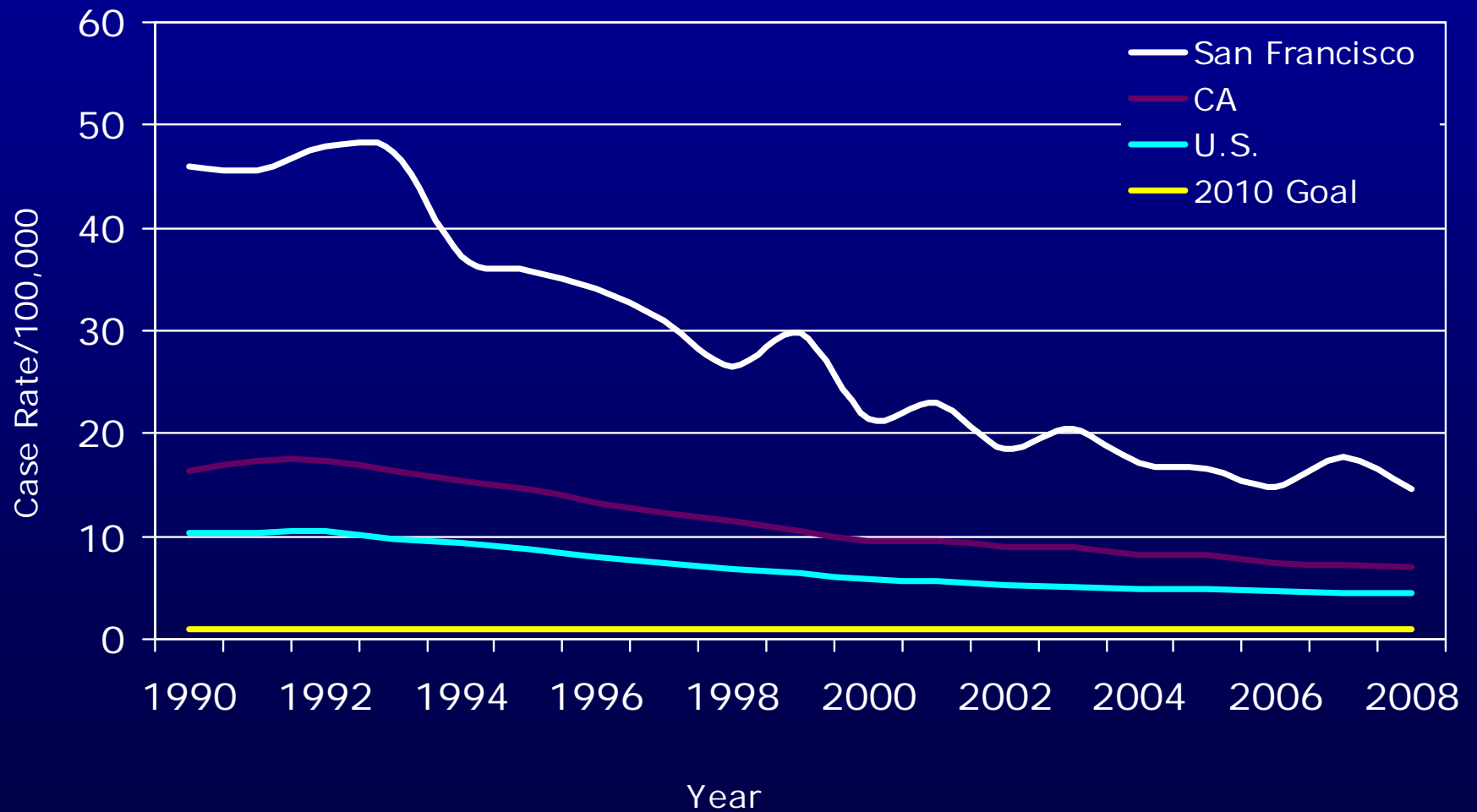




# TB Case Counts 1980–2008



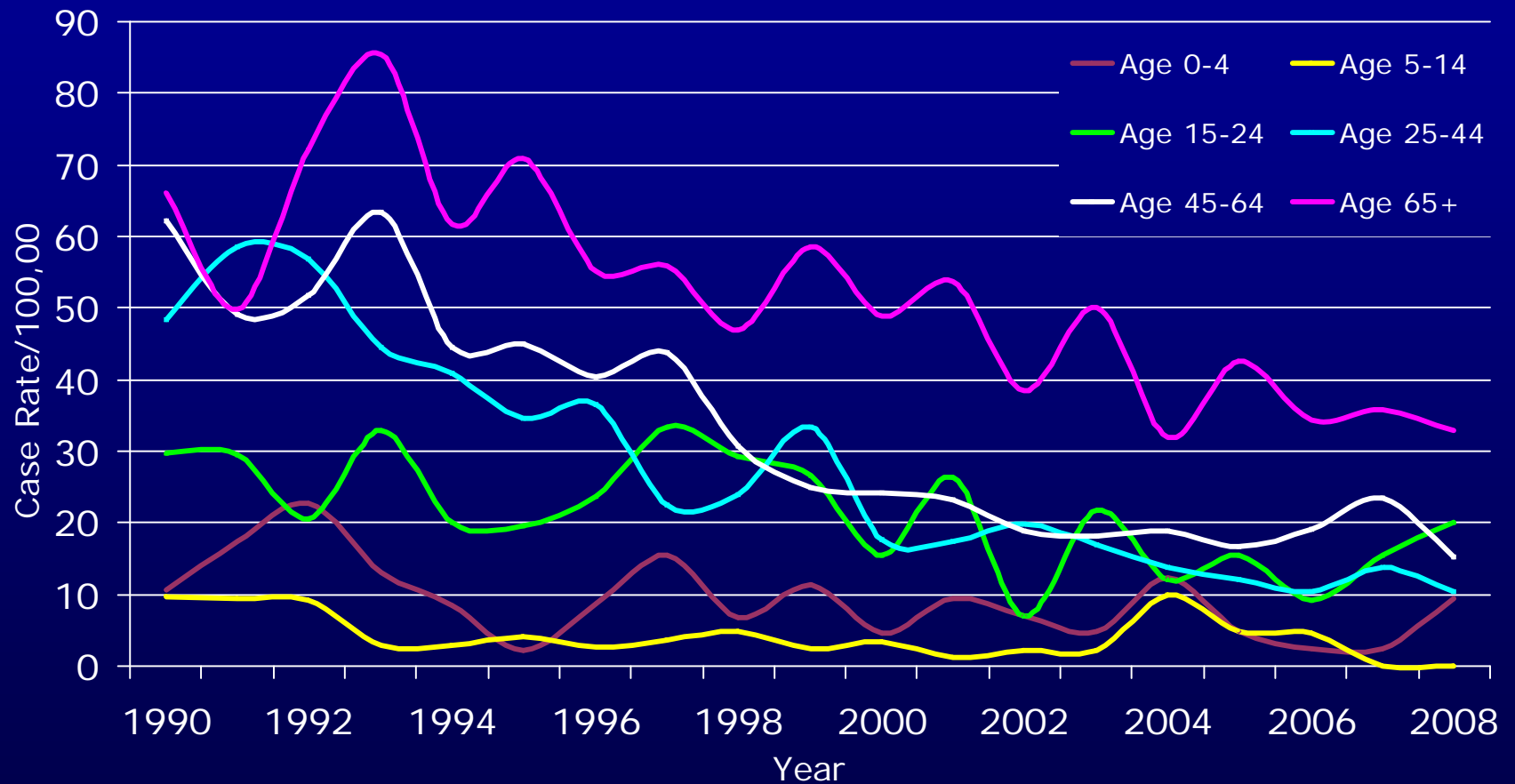
# TB Case Rates 1990–2008



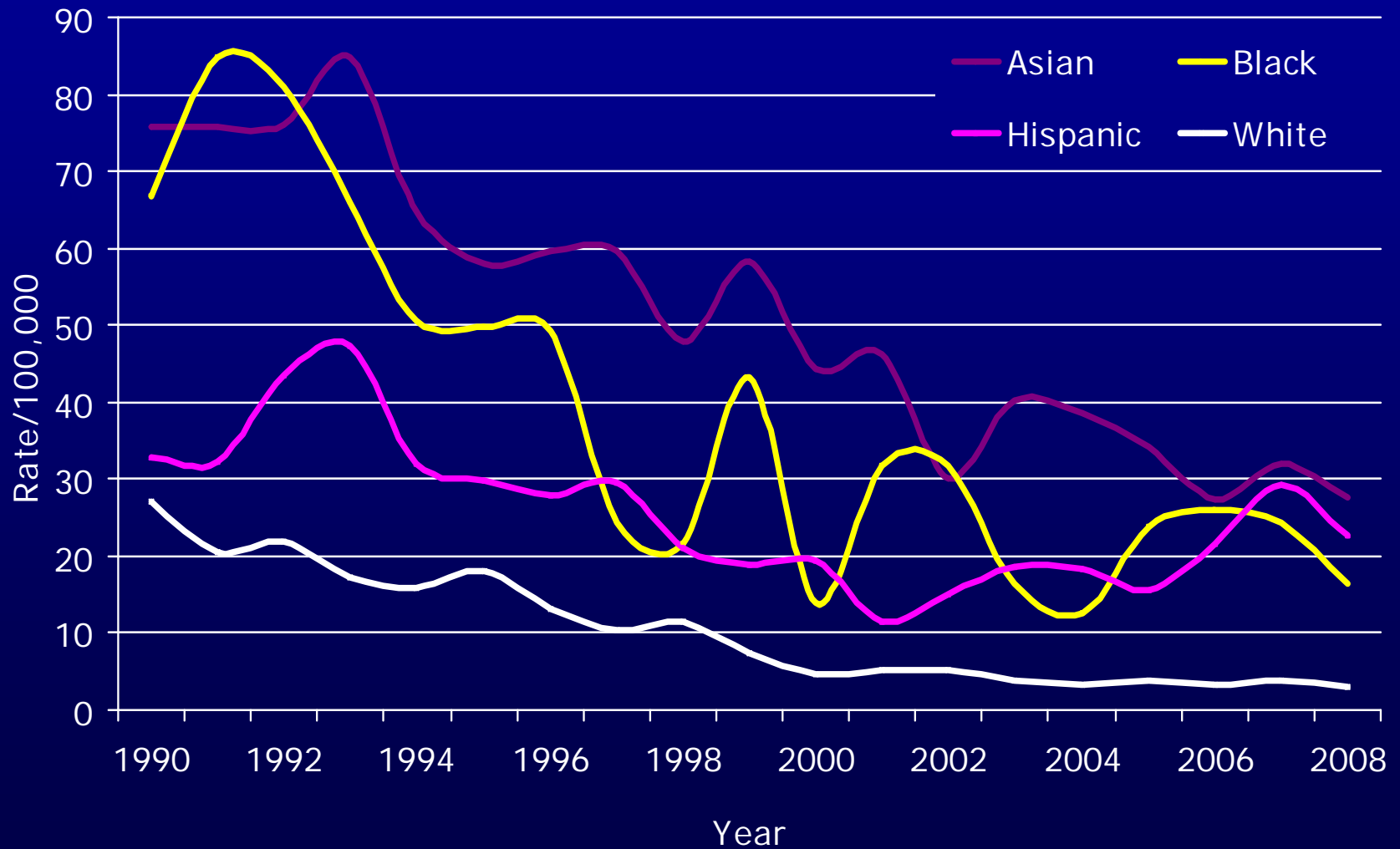
## *TB Cases 2008: Demographics*

- 76% are foreign-born
  - Asian and Hispanic cases
  - mostly due to reactivation of old infection
- 1 in 3 is ethnic Chinese
- 11% are HIV+
- U.S.-born cases are disproportionately African-American
  - rate 16.5/100,000 vs. white non-Hispanic rate of 3.0/100,000
- 12% are homeless
  - African-American, white non-Hispanic, HIV+
  - due to ongoing transmission and outbreaks

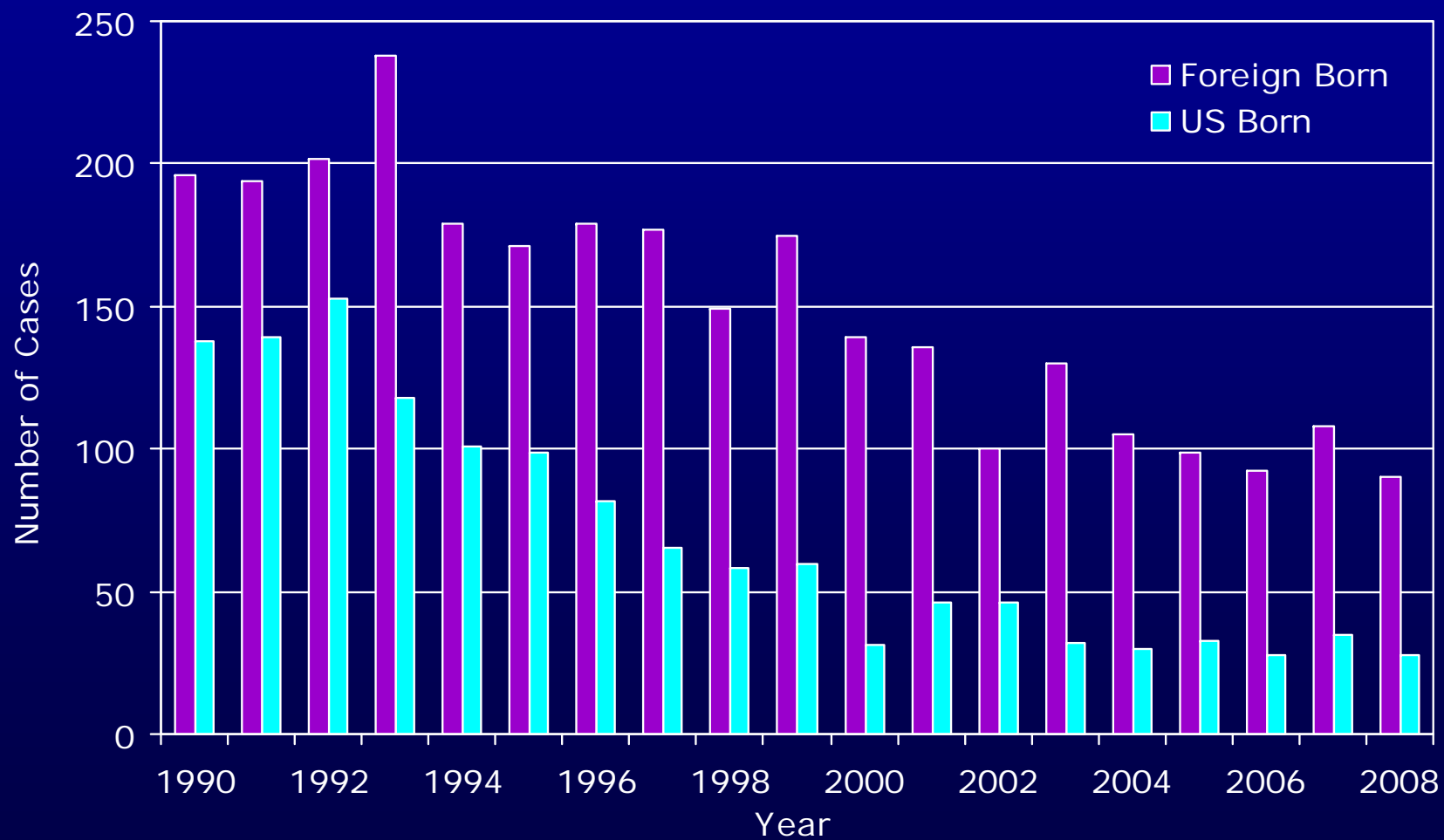
# TB Cases 2008: Age Group



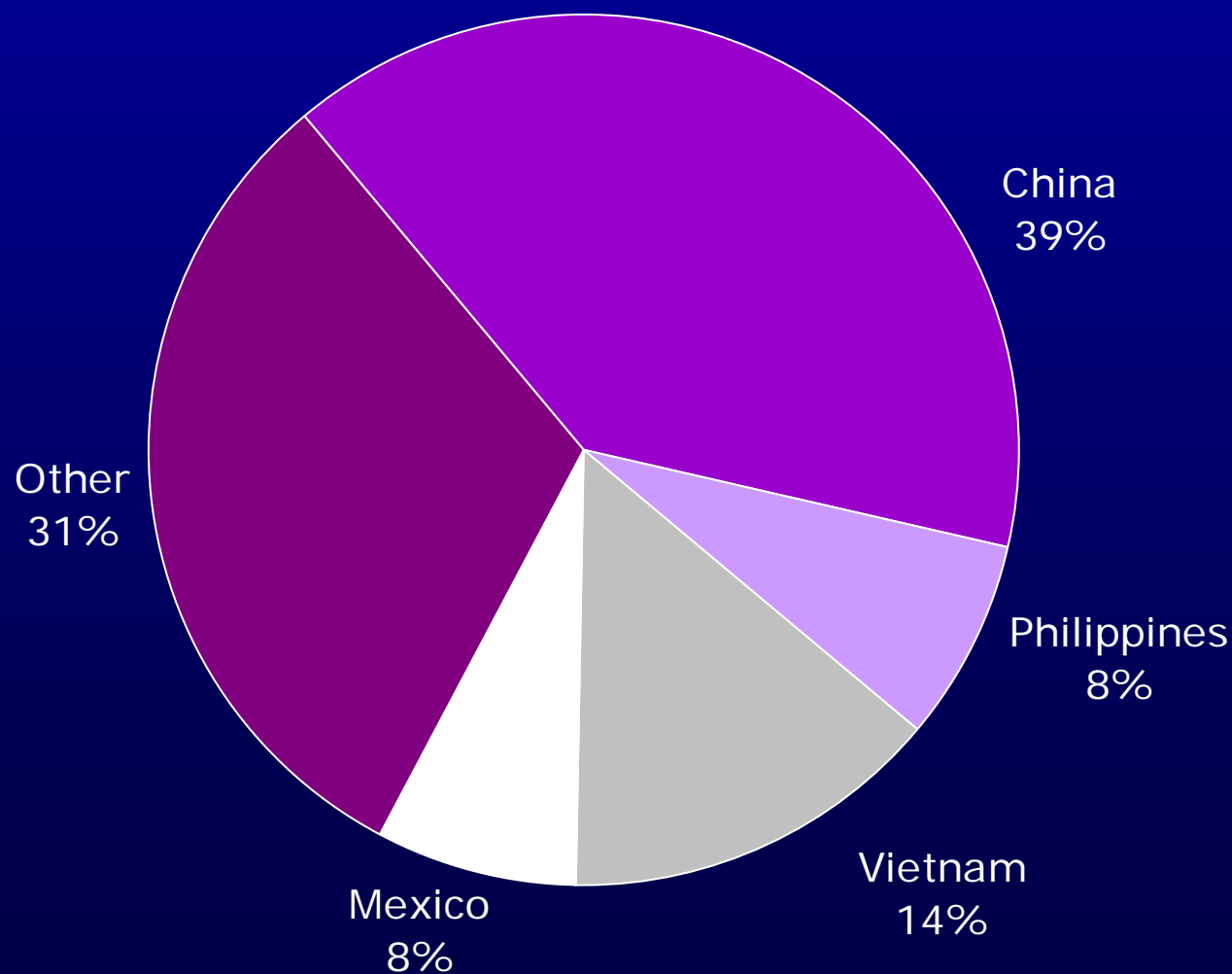
# TB Cases 2008: Race/Ethnicity



# *TB Cases 1990–2008: Nationality*



# *Foreign-born TB Cases 2008: Place of Birth*



## *TB Cases 2008: Social Factors*

### HIV:

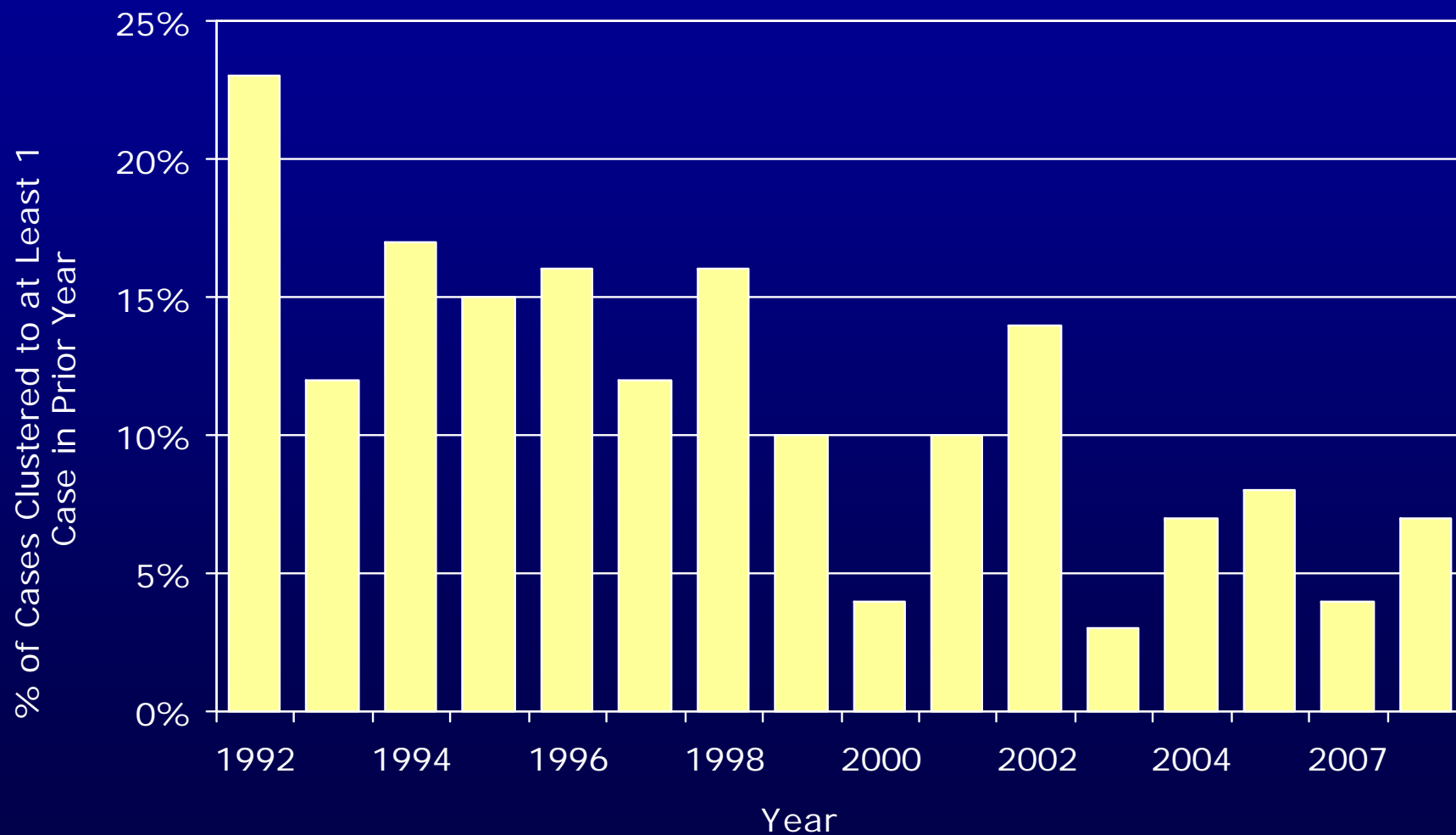
- 11% of all cases (13)  
(2006: 9.2%, 2007: 7.7%)

### Social Factors:

- Homelessness: 13% (15 cases)
- Drug abuse: 7.6% (NIDU), 3.4% (IDU)
- Alcohol abuse: 10%



# *Case Clustering In San Francisco, 1992-2008*



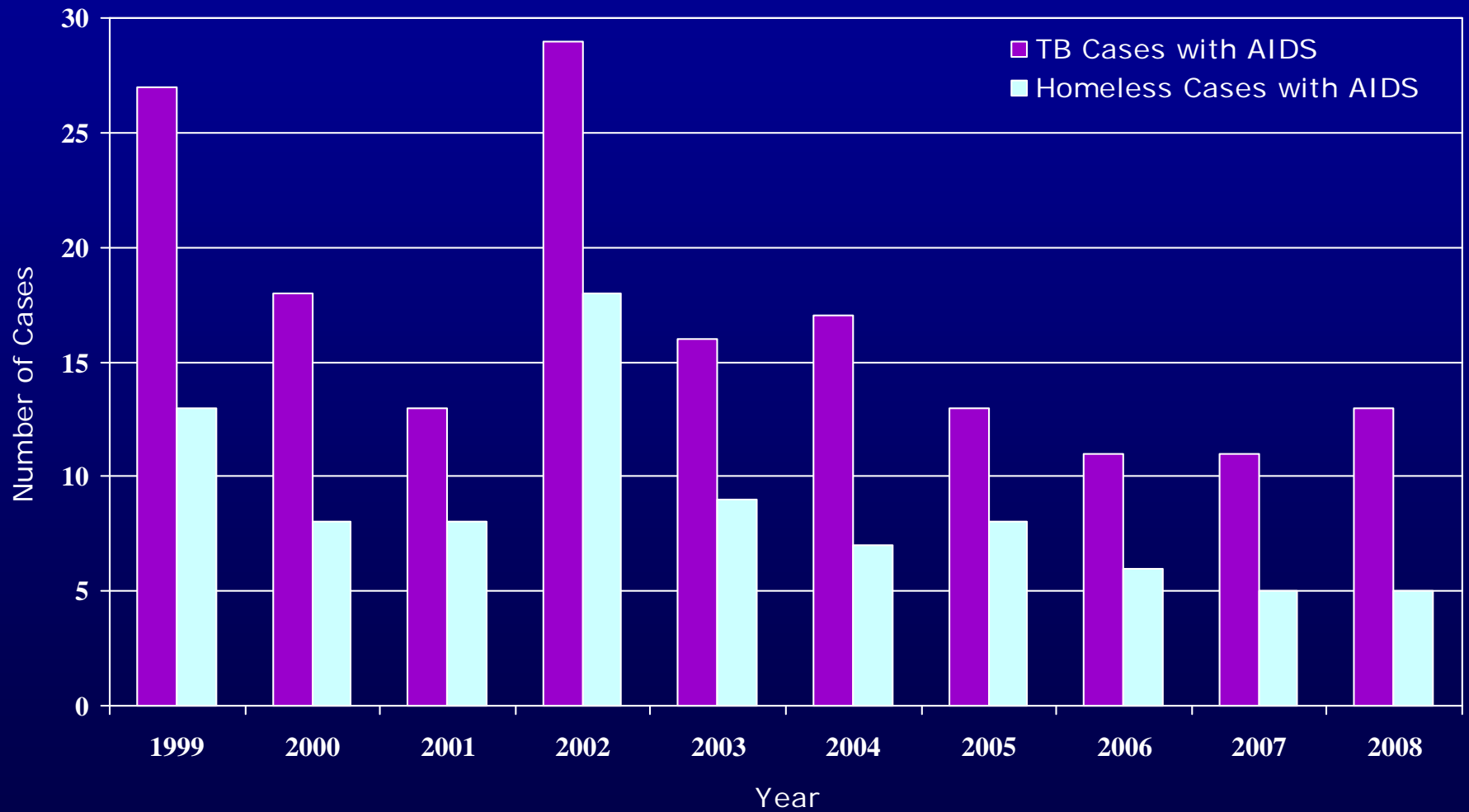
## *Homeless and SRO Cases 2003-2008*

Year	Shelter	SROs	Street/Other
2003 (n=21)	7 (33 %)	11 (52%)	2 (10%)
2004 (n=11)	3 (28%)	4 (36%)	4 (36%)
2005 (n=17)	1 (6%)	11 (65%)	5 (29%)
2006 (n=22)	4 (18%)	12 (55%)	6 (27%)
2007 (n=25)	5 (20%)	12 (48%)	8 (32%)
2008 (n=15)	4 (27%)	6 (40%)	5 (33%)

2007 Homeless Population: Shelter=1,500, Street=2,771

2007 Homeless Rate: Shelter=334/100,000, Street=288/100,000

# HIV/TB 1999-2008



## *TB Cases 2008: Drug Resistance*

- INH: 4.3% of Cx+ cases resistant to INH (4 cases in 2008)
- MDR: 1 cases in 2008 (<1%)
  - Resistant to INH, RIF, STREP
- Acquired: None!

# MDR/XDR Drug Resistance Patterns: 1999-2008

YEAR	INH	RIF	EMB	PZA	Strep	Ethion	PAS	Capreo	Inject.	Quino.
1999	1	1			1	1				
	1	1								
	1	1		1						
2001	1	1		1						
	1	1		1						
	1	1	1	1						
2002	1	1	1	1	1	1	1			
	1	1	1	1				1		
	1	1	1	1						
2003	1	1		1	1	1		1		
	1	1	1	1	1	1		1	1	
2004	1	1								
	1	1								
	1	1	1	1						
2005	1	1	1	1	1		1	1	1	
2006	1	1	1	1				1	1	
	1	1	1	1	1	1			1	1
2007	1	1								
	1	1		1	1					
2008	1	1			1					

## *TB Deaths 2005-2008*

- 60 deaths among TB cases
  - 9-14% of cases per year die with TB
  - National TB death rate is 4.7%
- 69% of deaths are among foreign-born Asians
  - Ave. age at death: 80 y.o.
  - 74% male
  - 81% diagnosed/managed by private MDs
  - Ave. time from report to death – 23 days
- Review of cases suggests deaths may be preventable due to delays in diagnosis and management errors by private MDs

## *"Death Tool"*

- Created by CDPH, TBCB
  - Data abstraction tool used to determine the TB relatedness of the death and management and treatment issues that may have caused the death
- Review of 19 cases reported in 2006-2007
  - 16 were TB-related; considered to have "extensive" disease (63%)
  - Majority were Chinese (79%)
  - 89% had at least 1 co-morbidity
  - Most common missed opportunities were provider delays in diagnosis (47%)

*Management and  
Treatment of Active TB*



## *Treatment of Active TB*

- Continue to meet national, state and local goal of 98% treatment completion
  - Since 2005, lost 5 cases
  - 1 terminal patient d/c'd treatment due to extreme adverse reaction
- 81% of cases completed within 12 months (Goal:  $\geq 90\%$ )
- 97% started on a timely and adequate regimen (Goal: 100%)
- 95% treated by DOT (Goal: 90%)

## *Sputum Culture Conversion*

- Goal:  $\geq 90\%$  convert within 90 days of starting treatment
- Goal has not been met in last 5 years for PMD-managed cases
- Reviewed 2005-2008 PMD cases
  - 21 of 61 PMD cases (34%) conversion was not documented
  - 16 of 21 (76%) died before conversion could be documented
  - If cases that die are excluded, PMD conversion rate is 77-100% per year

# HIV Testing

	Over 15 y.o.			25-44 y.o.		
	Cases	Offered*	Refused	Cases	Offered*	Refused
2005	119	107 (79%)	35 (29%)	31	31 (100%)	6 (19%)
2006	107	88 (82%)	26 (24%)	29	29 (100%)	5 (17%)
2007	131	115 (88%)	39 (30%)	36	36 (100%)	9 (25%)
2008	118	104 (86%)	24 (23%)	29	22 (100%)	2 (9%)

\*Offered to those without a known positive result.

*Active Case Finding and  
Targeted Testing*

# *Case Finding Methods*

- Passive
  - Hospital and MD referrals
- Active
  - Immigration screening
  - Contact Investigation
  - Community screening
- 30% of cases in 2008 found through active TB screening
- Targeted testing yields 3x more cases than contact investigation and immigration screening combined

# 2008 Referrals and Targeted Testing Outcomes

	Immigration	C.I	T.T Foreign-born	T.T. U.S.-born
Referred/ Identified	293	1795	1734	962
Evaluated	265 (90)	1095 (64)	1547 (89)	783 (81)
<b>TB3</b>	<b>6 (2)</b>	<b>3 (0.3)</b>	<b>22 (1)</b>	<b>4 (1)</b>
TB2/4	176 (66)	228 (21)	1288 (83)	685 (87)
Eligible for LTBI Rx	122 (69)	192 (84)	681 (53)	217 (32)
Started LTBI Rx	111 (91)	149 (78)	558 (82)	143 (66)
<b>Completed LTBI RX (2007)</b>	<b>97 (90)</b>	<b>90 (82)</b>	<b>485 (72)</b>	<b>93 (57)</b>

## *TOPS Activities*

- 658 persons screened for TB
  - 10% decrease from 2007
- Attended 4 Project Homeless Connect Events
  - 76 homeless received shelter clearance
- 44 patients placed in DOPT
- 59% completed LTBI Rx in 2007

## *CHOPS Activities*

- 482 patients tested with QFT
  - 32% decrease in QFT/TST testing since 2004
  - 16% positive
  - 3% indeterminate
- 114 patients placed on LTBI treatment
  - Estimated 92% completion for 2008
  - 2007 completion: 83%



# *LTBI Treatment*

# *LTBI Treatment Completion\**

	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
Foreign -born (# started)	76% (1679)	74% (1666)	64% (1211)	59% (870)	68% (819)	72% (705)
U.S.- Born (# started)	63% (270)	64% (274)	62% (219)	44% (147)	51% (161)	57% (179)
<b>All</b> (# started)	<b>74%</b> (1986)	<b>73%</b> (1950)	<b>64%</b> (1430)	<b>57%</b> (1041)	<b>65%</b> (987)	<b>69%</b> (988)

\*excludes contacts, b-notifications, DOPT, and patients treated outside TB clinic

# Follow-up Factors Influencing LTBI Treatment Completion

	<u>2005**</u>			<u>2006**</u>			<u>2007**</u>		
	<u>Comp.</u>	<u>Incomp.</u>	*	<u>Comp.</u>	<u>Incomp.</u>	*	<u>Comp.</u>	<u>Incomp.</u>	*
# Kept Appts. (mean)	3.8	0.8	*	5	1.1	*	5.1	1.4	
FU Time (mean days)	6.4	10.3	*	4.7	5		4.8	5.2	
Letter Only (%)	10.3	24.3	*	2.3	12	*	1.1	16.7	*
Kept 1 <sup>st</sup> Appt. (%)	73.2	24.6	*	78.6	27.6	*	75	24	*
FU Time 1 <sup>st</sup> Appt. (mean days)	8.8	13	*	4.2	6.1		5.8	5.7	

\*\*September-December., \*p<0.05

# *Contact Investigation*

# Contact Evaluation Outcomes 2008

	Contacts to Smear+ Cases	All Contacts
Contacts eligible for evaluation	1069	1705
Fully evaluated	648 (61%)	1095 (64%)
Cases found	0	3
Infection prevalence	162 (25%)	228 (21%)
Initiation of LTBI treatment of eligible	106 (80%)	149 (78%)



# Contact Evaluation Outcomes by Testing Method

## March 2005 – December 2007

N=1477	TST	QFT-G
Contacts tested	717	760
Fully evaluated *	388 (54%)	492 (65%)
Cases found	8 (2%)	9 (2%)
Infection prevalence*	160 (23%)	145 (19%)
Initiation of LTBI * treatment of eligible	117 (73%)	128 (88%)
Completion of treatment	84/117 (72%)**	102/128 (80%)**

\* p value = <0.05

\*\*excludes those who moved or died

# *Exposure Correlation by Testing Method*

*March 2005 – December 2007*

		QFT		TST	
<b>Contacts to all Cases</b>	% (n/N)	P-value	% (n/N)	P-value	
<b>Positive Test</b>					
Index Sm+	33% (94/283)	0.018	44% (102/233)	0.151	
Index Sm-/Cx+	23% (41/179)		36% (43/120)		
<b>Test Conversion</b>					
Index Sm+	10% (12/126)	0.048	4% (3/71)	0.735	
Index Sm-/Cx+	3% (3/101)		3% (2/64)		



# *Exposure Correlation by Testing Method*

*March 2005 – December 2007*

		QFT		TST	
<b>Contacts Foreign-born Cases</b>	% (n/N)	p-value	% (n/N)	p-value	
<hr/>					
Positive Test					
Index Sm+	38% (70/185)	0.0001	52% (85/164)	0.69	
Index Sm-/Cx+	21% (30/143)		55% (34/62)		
Test Conversion					
Index Sm+	12% (9/77)	0.58	5% (3/56)	1.0	
Index Sm-/Cx+	4% (3/81)		4% (1/24)		

*Progress on Program  
Objectives*

# Active TB Cases and B-Notification

Objective	Year	Goal	Progress	Number Not Meeting Objective
<b>TREATMENT AND CASE MANAGEMENT OF PERSONS WITH ACTIVE TB</b>				
Treatment Completion within 12 Months	2007	≥90%	77%	17 – 15 had legitimate reasons for extending treatment
Overall Treatment Completion	2007	≥98%	96%*	2 – lost to follow-up; 1 – adverse reaction
Initiation of a Four-Drug Regimen – Cases <15	2008	≥75%	100%	
Initiation of a Four-Drug Regimen – Cases ≥15	2008	≥93%	95%	6 – 2 started on adequate regimens
Initiation of an Adequate Treatment Regimen	2008	100%	97%	4 – 3 PMD managed; 1 HD resident
Timely Treatment Initiation	2008	≥95%	97%	1 – PMD managed
Sputum Culture Conversion	2007	≥90%	83%	15 – 11 not documented, 4 converted >3 months
DOT	2008	90%	95%	5 – 3 PMD managed
Drug Susceptibility Testing	2008	100%	100%	
Sputum Culture – Cases >12 Years of Age	2008	≥97%	100%	
HIV Testing Offered	2008	90%	86%	15 – 10 over age 75, 2 tested neg. within 6 mo., 2 died
<b>CLASS A/B/ NOTIFICATIONS</b>				
Evaluation	2007	≥97%	95%	15 – 4 UTL, 1 wrong address, 4 return to POB
Time from Notification to Evaluation (average)	2008	<14 days	10 days	
LTBI Treatment Initiation	2008	≥95%	91%	11 – 4 refused, 7 not offered treatment
LTBI Treatment Completion	2007	≥80%	90%	17 – 5 d/c due to adv. reaction, moved, etc.

# Referrals, C.I., and Surveillance

Objective	Year	Goal	Progress	Number Not Meeting Objective
<b>TARGETED TESTING AND COMMUNITY REFERRALS</b>				
Evaluation of Community Referrals	2008	≥95%	86%	384 – 187 foreign-born, 179 U.S-born
LTBI Treatment Completion - U.S.-born	2007	78%	58%*	67 – lost/refused
LTBI Treatment Completion - Foreign-born	2007	77%	72%*	185 – lost/refused
<b>CONTACT INVESTIGATION</b>				
Contact Evaluation	2008	≥95%	56%	362 – 239 no follow-up test, 121 – incomplete evaluation
LTBI Treatment Initiation Among Contacts	2008	77%	79%	36 – 1 <15 y.o., 35 ≥ 15 y.o.
LTBI Treatment Completion Among Contacts	2007	84%	82%	19 – lost/refused
TB Case Interview	2008	85%	82%	17 – not interviewed within 1 day of report to TB clinic
TB Case Home Assessment – Smear +	2008	55%	42%	22 – no assessment within 3 days of report to TB clinic
TB Case Home Assessment – Smear -	2008	70%	75%	14 – no assessment within 7 days of report to TB clinic
Contact Identification	2008	≥95%	95%	2 – no contacts identified
<b>TB SURVEILLANCE</b>				
Timely Case Reporting	2008	90%	77%	26 – not reported within 1 day of starting treatment
RVCT Reporting	2008	100%	100%	
Documentation of HIV Status	2008	≥80%	97%	1 – offered testing but refused
Drug Susceptibility Testing and Reporting	2008	100%	100%	

## *2009 Projects*

- Continue evaluating deaths with “Death Tool”
- Continue monitoring LTBI treatment completion rates
  - Implement Teleminder system and evaluate
- Analyze and publish SF QFT experience
  - Use in contact investigation
  - Managing indeterminate results
  - Disease progression in patients with (-) result
- Continue monitoring C.I. outcomes



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