

Who Attends Private Schools?

Enrollment rates by ethnicity in California

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Public school districts are interested in local private school enrollment rates

This is because:

- Changes in private school enrollments often result in changes in public school enrollments**
- Transfers between public and private schools can explain oddities in grade progression patterns (such as many more 9th graders than 8th graders the year before)**
- Private school rates can indicate how the public school district is perceived**

Two sources of data on private school enrollments

- **Administrative data from the private schools, reported to state agencies, but**
 - **Students may live outside the public school district boundaries in which the private school is located**
 - **Poor reporting, at least in California, since there is no penalty for misreporting or not reporting**
- **Census and survey data**
 - **2000 Census long form SF3**
 - **American Community Survey**

California and two of its Counties

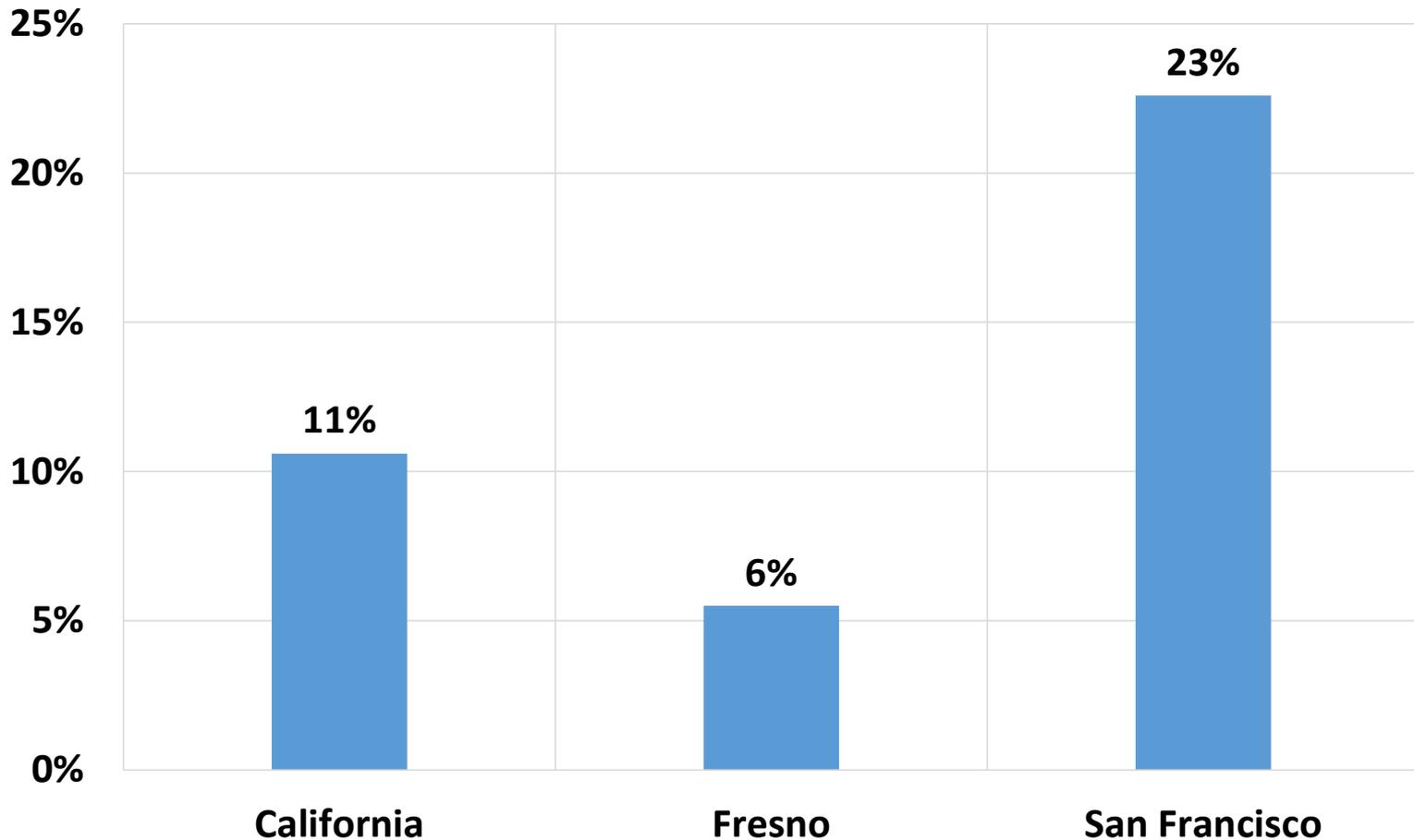
San Francisco, CA (*city/county/school district*)

Fresno, CA (*county, city*)

- **Studied using PUMS data from the 2007-2011 American Community Survey**
- **Descriptive statistics + logistic regression analysis**
- **Geographic units: counties and PUMAs within each county**

San Francisco and Fresno's K-12 private enrollment rates couldn't be more different

Private School Rate by Area
2007-11 ACS



Yet in both counties, and in the state, private school enrollment rates vary

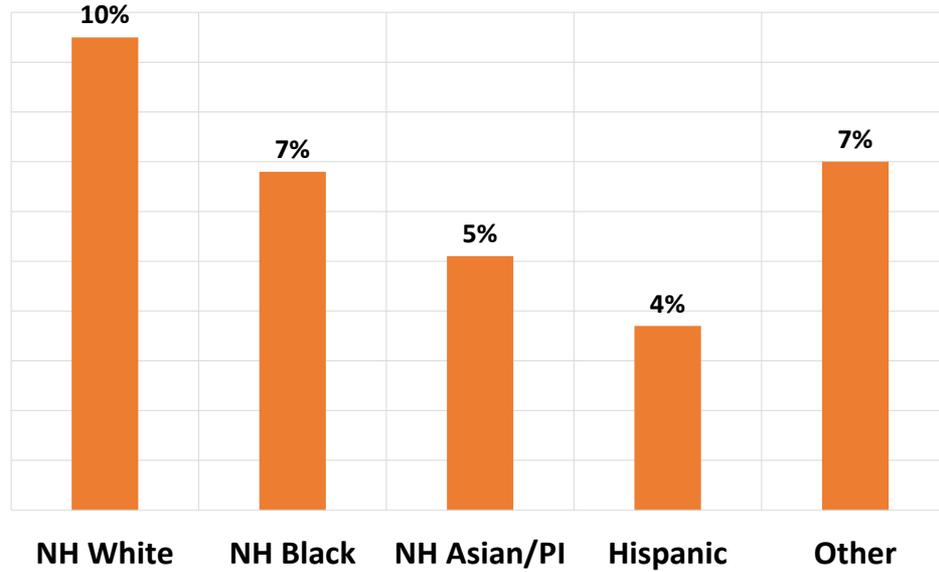
By:

- Race/ethnicity**
- Household income**
- Other socioeconomic measures**
- School level (kindergarten, elementary, middle, high)**
- Location of school district**

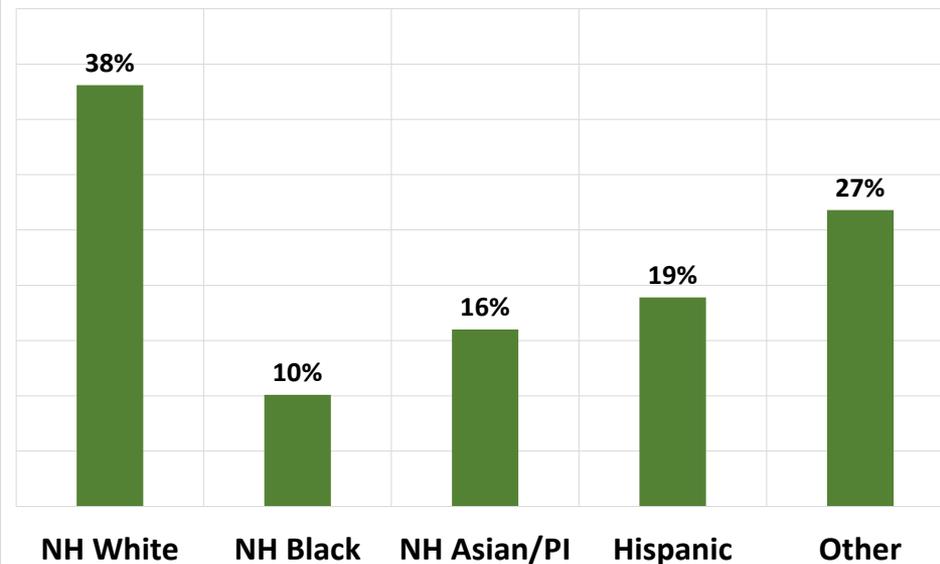
But how much do they vary, and which factors matter most? Do the effects differ by area?

African Americans have *relatively* higher rates in Fresno than in San Francisco

Private School Rates by Ethnicity, 2007-2011
Fresno



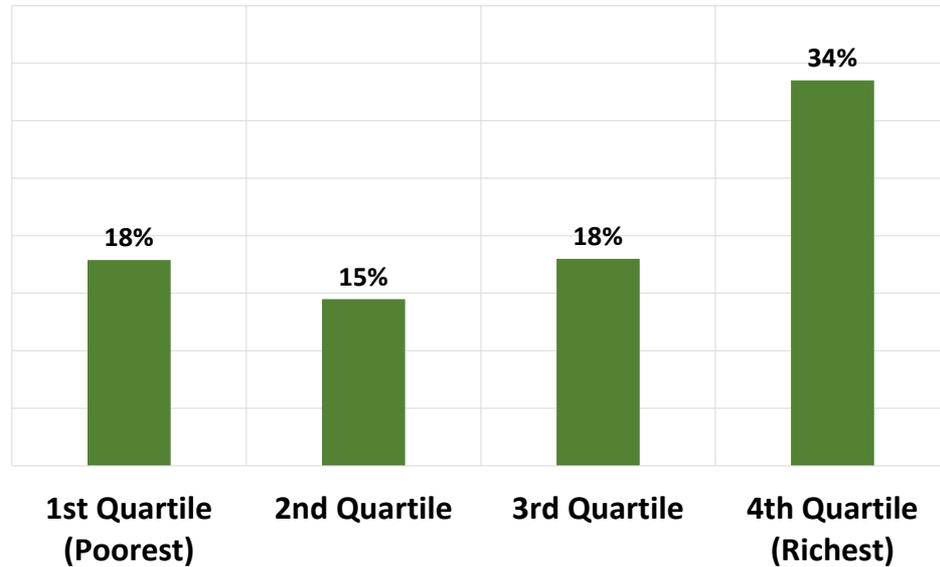
Private School Rates by Ethnicity, 2007-2011
San Francisco



**San Francisco has an unusual pattern:
students in the lowest quartile of household
income have higher rates than those in the
2nd quartile**

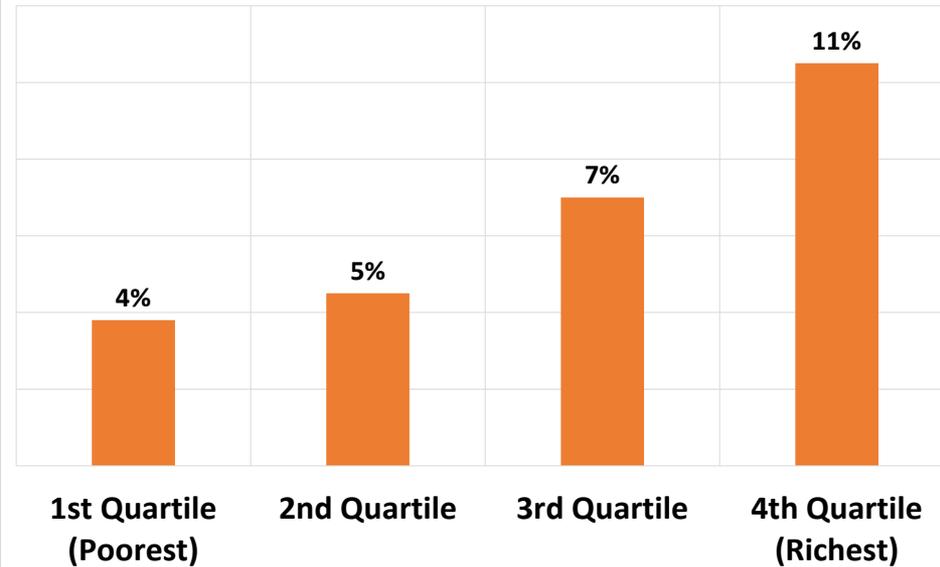
Private School Rates by Household Income, 2007-2011

San Francisco



Private School Rates by Household Income, 2007-2011

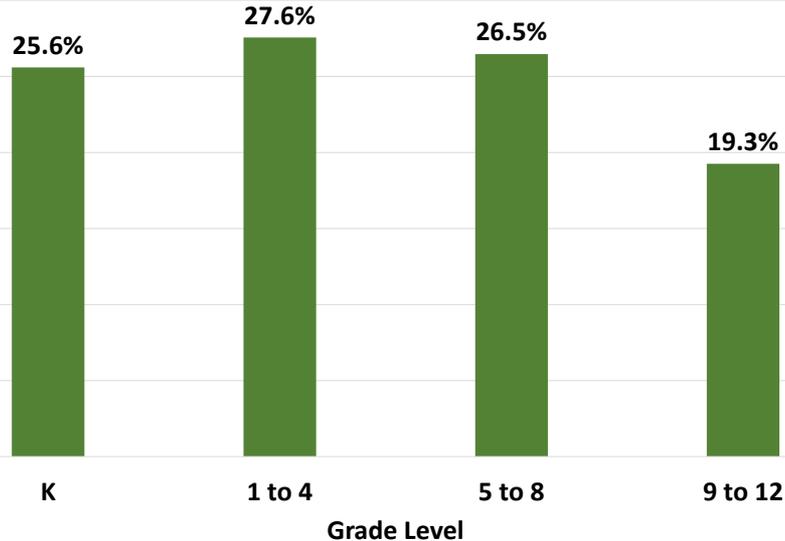
Fresno



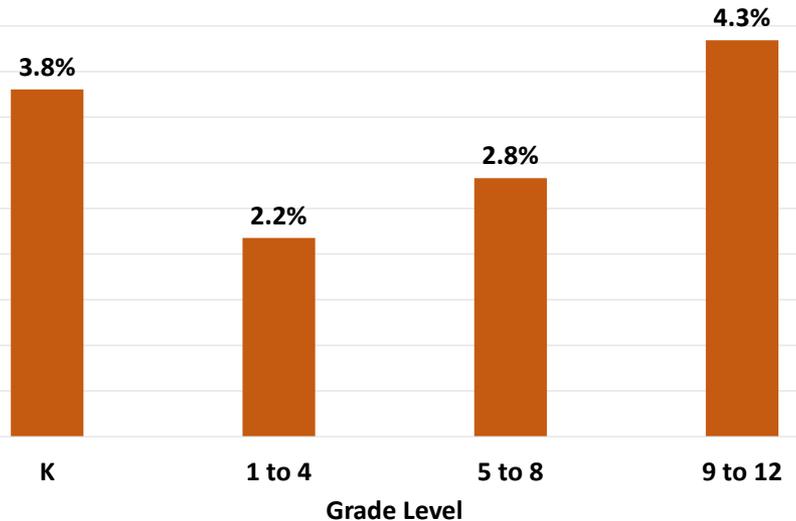
Private school scholarships?

San Francisco and Fresno have different patterns of private school enrollment by grade level

2007-11 ACS Private School Rates by Grade
San Francisco Unified School District



2007-11 ACS Private School Rates by Grade
Fresno Unified School District



Different perceptions of desirability of public and private schools for each school level?

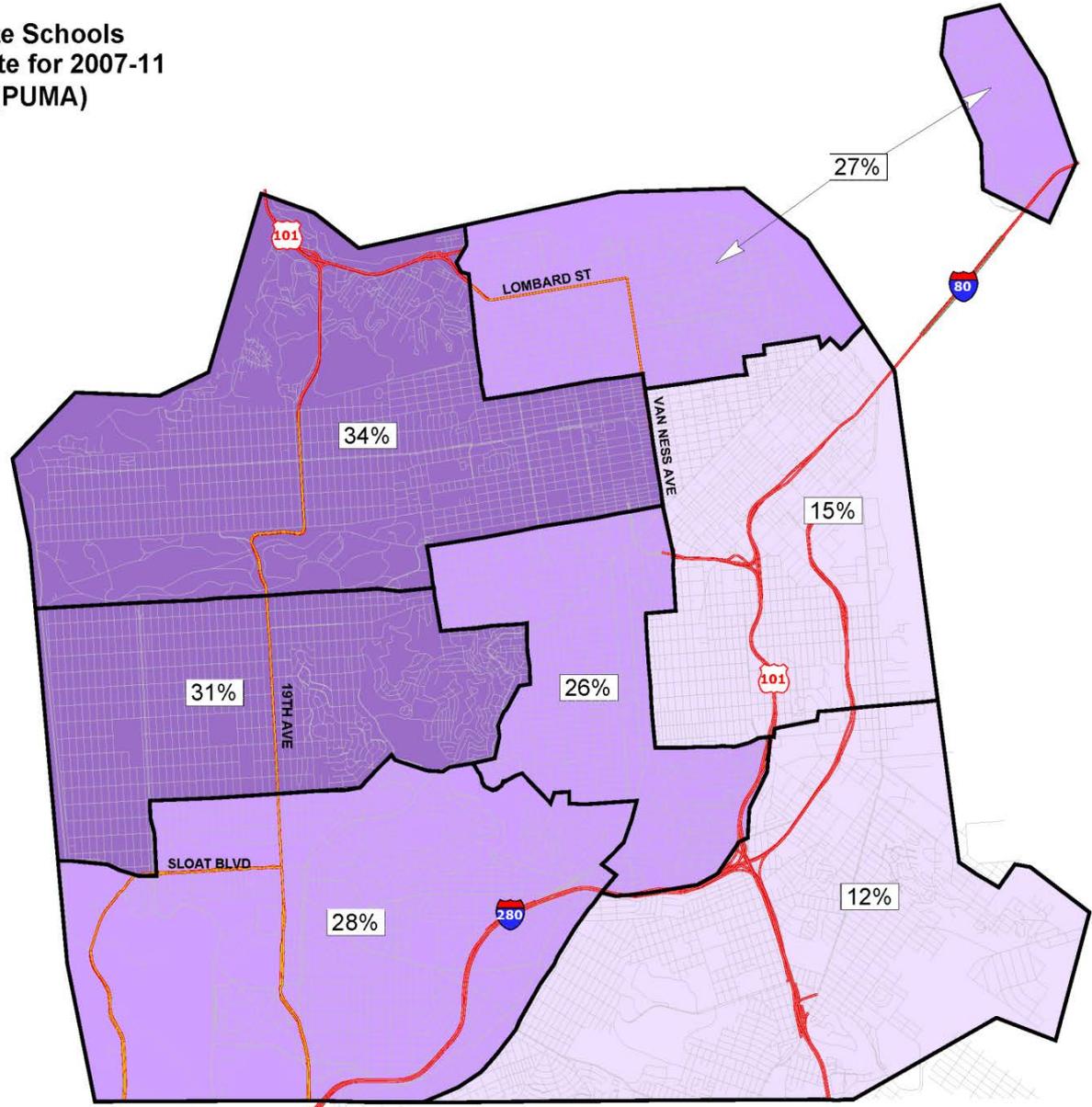
Private school enrollment rates vary by geographical subarea (PUMA) – San Francisco

Percent of K-12 Enrollees in Private Schools
American Community Survey Estimate for 2007-11
by Public Use Microdata Area (PUMA)

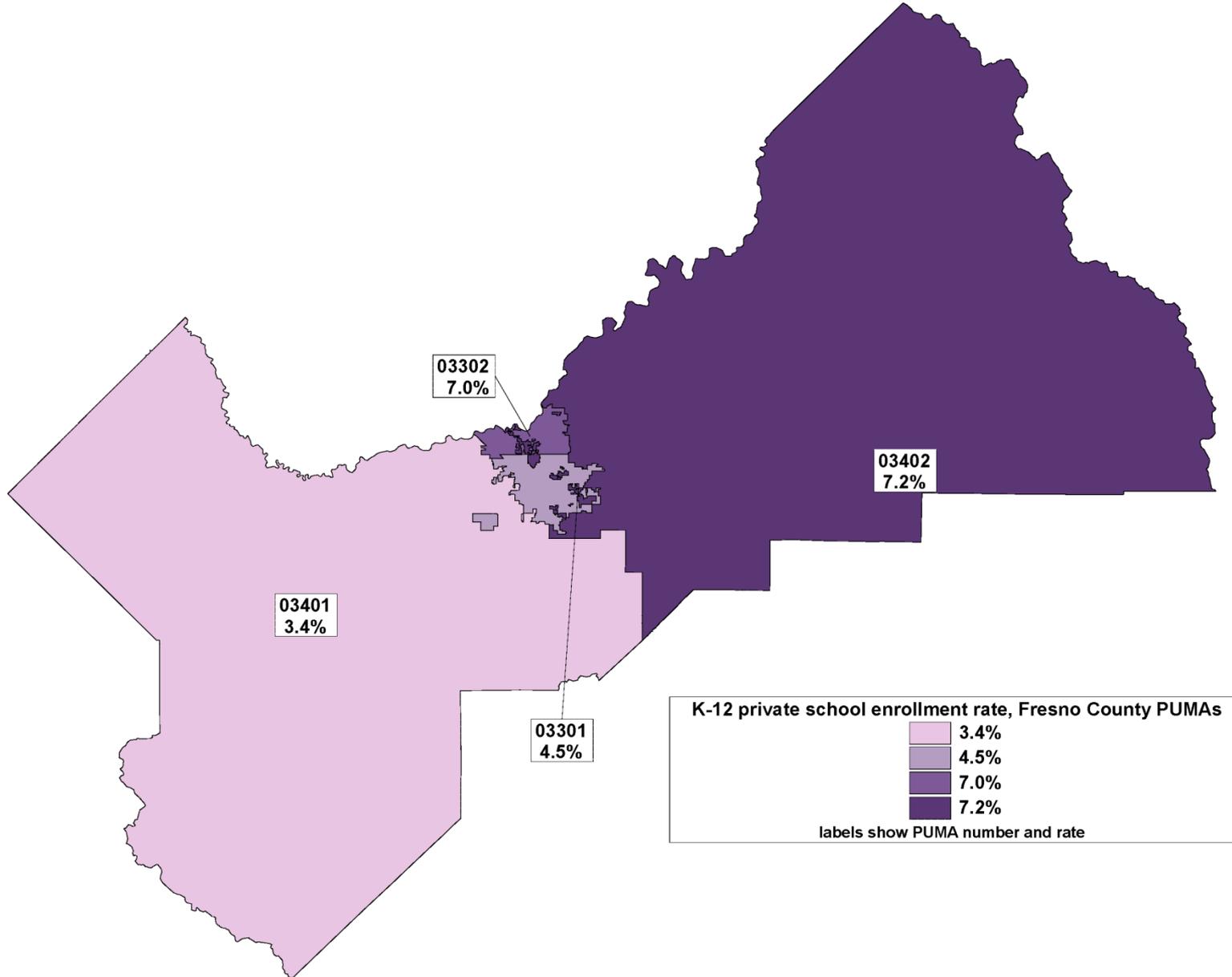
- 10% to 19%
- 20% to 29%
- 30% to 39%



PUMAs labeled with Percent of K-12 Enrollees that were in Private Schools



Private school enrollment rates vary by geographical subarea (PUMA) – Fresno County



Multivariate regression analysis

To understand the geographical difference in private school enrollment patterns, it is necessary to:

- **control for correlations among the variables**
- **measure differences in the impact of each factor on private school rates in Fresno, San Francisco and the whole of California**

Statistical strategy = one big logistic regression model with interactions

Logistic regression on the odds of attending private school (with interactions) for all K-12 Students in California

2007-11 ACS

	California	Fresno	San Francisco
Category	Explanatory Variables	Odds Ratio P> z	Odds Ratio P> z
Race and ethnicity	White	Reference	Reference
	African American	0.803 ***	0.281 **
	Asian/Pacific Islander	0.68 ***	0.765
	Hispanic	0.448 ***	0.985
	Multiple or other race	0.893 ***	1.124
Place of birth	United States	Reference	Reference
	Foreign born	0.614 ***	0.759
Sex	Male	Reference	Reference
	Female	1.067 ***	0.9
Living arrangements	Both parents	Reference	Reference
	Father only	0.656 ***	1.305
	Mother only	0.871 ***	0.813
Housing type	Single family home	Reference	Reference
	2-4 unit building	0.708 ***	0.589
	5-20 unit building	0.757 ***	0.657
	Other	0.764 ***	1.02
Household income	First quartile	Reference	Reference
	Second quartile	1.204 ***	0.882
	Third quartile	1.749 ***	0.712 *
	Fourth quartile	2.968 ***	0.56 ***
Food stamp recipient	No	Reference	Reference
	Yes	0.446 ***	1.217
Fresno PUMAs	3301		0.842
	3302		0.766
	3401		0.474 ***
	3402		0.922
San Francisco PUMAs	2201		9.901 ***
	2202		11.632 ***
	2203		4.089 ***
	2204		4.119 ***
	2205		4.779 ***
	2206		4.251 ***
	2207		3.053 ***
	Constant	0.101 ***	

To convert odds into probabilities : the formula is $p = \text{odds}/(1+\text{odds})$

The probability of attending private school for a student in California with all the reference characteristics (white, born in the US, male, living with both parents in a single family home, in the poorest income quartile but not receiving food stamps) is $0.101/(1+0.101) = 0.09207$, or about 9.2%.

		California	Fresno	San Francisco
Category	Explanatory Variables	Odds Ratio P> z	Odds Ratio P> z	Odds Ratio P> z
Race and ethnicity	White	Reference	Reference	Reference
	African American	0.803 ***	0.281 **	0.429 ***
	Asian/Pacific Islander	0.68 ***	0.765	0.418 ***
	Hispanic	0.448 ***	0.985	1.395 **
	Multiple or other race	0.893 ***	1.124	0.754
Place of birth	United States	Reference	Reference	Reference
	Foreign born	0.614 ***	0.759	1.049
Sex	Male	Reference	Reference	Reference
	Female	1.067 ***	0.9	0.814 **
Living arrangements	Both parents	Reference	Reference	Reference
	Father only	0.656 ***	1.305	1.093
	Mother only	0.871 ***	0.813	1.153
Housing type	Single family home	Reference	Reference	Reference
	2-4 unit building	0.708 ***	0.589	0.795
	5-20 unit building	0.757 ***	0.657	0.355 ***
	Other	0.764 ***	1.02	0.673 *
Household income	First quartile	Reference	Reference	Reference
	Second quartile	1.204 ***	0.882	1.056
	Third quartile	1.749 ***	0.712 *	1.071
	Fourth quartile	2.968 ***	0.56 ***	1.187
Food stamp recipient	No	Reference	Reference	Reference
	Yes	0.446 ***	1.217	0.794
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	2207			3.053 ***
	Constant	0.101 ***		

The odds are the result of the multiplication of the constant by the odds ratio for each relevant variable.

If the student has all the baseline characteristics but lives in Fresno PUMA 3401, his probability of attending private school is
 $(0.101 * 0.474) / (1 + (0.101 * 0.474)) = 0.04585$
or about 4.6%

Category	Explanatory Variables	California Odds Ratio P> z	Fresno Odds Ratio P> z	San Francisco Odds Ratio P> z
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	2205			4.779 ***
	2206			4.251 ***
	2207			3.053 ***
		Constant	0.101 ***	

For example, the probability of an Hispanic girl attending a private school:

- (1) If she lives in California but in neither Fresno or San Francisco is: $(0.101*0.448*1.067)/(1+(0.101*0.448*1.067)) = 4.6\%$**
- (2) If she lives in Fresno PUMA 3301, 3302, or 3402, her probability is the same as in (1) because the coefficients for these Fresno PUMAs and for being a girl in Fresno and being Hispanic in Fresno (which are equal to 0.900 and 0.985, respectively, for the last two) are *not significant*.**
- (3) If she lives in Fresno PUMA 3401 , the probability is: $(0.101*0.448*1.067*0.474)/(1+(0.101*0.448*1.067*0.474)) = 2.3\%$**
- (4) If she lives in San Francisco PUMA 2207 (here we need to include both the coefficient for San Francisco PUMA 2207 and the coefficients for female and Hispanic because these are significant), the probability is: $(0.101*0.448*1.067*1.395*0.814*3.053)/(1+(0.101*0.448*1.067*1.395*0.814*3.053)) = 14.4\%$**

Main results (1)

Overall, largest differences are due to:

- **place of residence (San Francisco vs. rest of California)**
- **wealth (income and food stamps)**
- **race and ethnicity (Hispanics vs. Whites)**

Main results (2)

Geographic variations in the impact of some explanatory variables:

- **Race and ethnicity (differ from statewide patterns in Fresno and San Francisco – especially for African Americans)**
- **Income (smaller in Fresno)**
- **Housing type (smaller in San Francisco)**



Conclusions:

- **Household income has the largest effect on private school enrollment rates.**
- **Whites have higher rates of private school enrollment, even after controlling for income.**
- **Hispanics have the lowest rates statewide but not in Fresno or San Francisco, where African Americans rank lowest.**
- **Race/ethnicity and household income are strong variables in both cities.**
- **San Francisco has a “culture” of private schooling; even the poorest households in the city have private school enrollment rates 3 to 11 times higher than elsewhere.**

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