

# **Measuring Variations in Private School Enrollment Rates Using ACS Estimates**

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# Private school enrollment rates

- **Affect public school enrollments & enrollment forecasts**
- **Vary**
  - **Over time**
  - **By race/ethnicity**
  - **By other (mostly socioeconomic) factors**
- **Are not available (at least in California) from administrative records**

# **What can we learn about private school enrollment rates from ACS surveys?**

**We studied California K-12 private school enrollment rates, by ethnicity:**

- Using PUMS estimates for Census 2000 PUMAs:**
  - ACS 5-year 2007-2011 estimates**
  - Several sets of ACS 3-year estimates: 2006-08, 2008-10, 2009-11**
- Aggregating PUMAs to the county level (or counties to the PUMA level, in less populous areas)**
  - 58 California counties became 34 complete counties (each with one or more PUMAs) + 7 multiple-county aggregations (from two to seven counties)**

## **What we learned, among other things:**

- **Margins of error are large for estimates in areas with small populations:**
  - Many counties have insufficient populations for estimates to be useful (statistically significant)
  - Even at the PUMA level (county aggregations), estimates for small race/ethnic groups can have huge error margins
- **Margins of error are large for estimates of enrollment rates for race/ethnic groups that may not comprise a very large share of those sampled**

# Methodology

- We computed the proportion of K-12 students in private school along with 95% confidence intervals (weighted values standardized to the mean) by race, for California counties/county groupings
- We computed confidence intervals using the Clopper-Pearson exact confidence interval method (the R package 'PropCIs')
  - In order to constrain the interval to be within plausible margins (between 0 and 1)

# Results for 5-year ACS estimates

## 2007-2011 ACS PUMS data

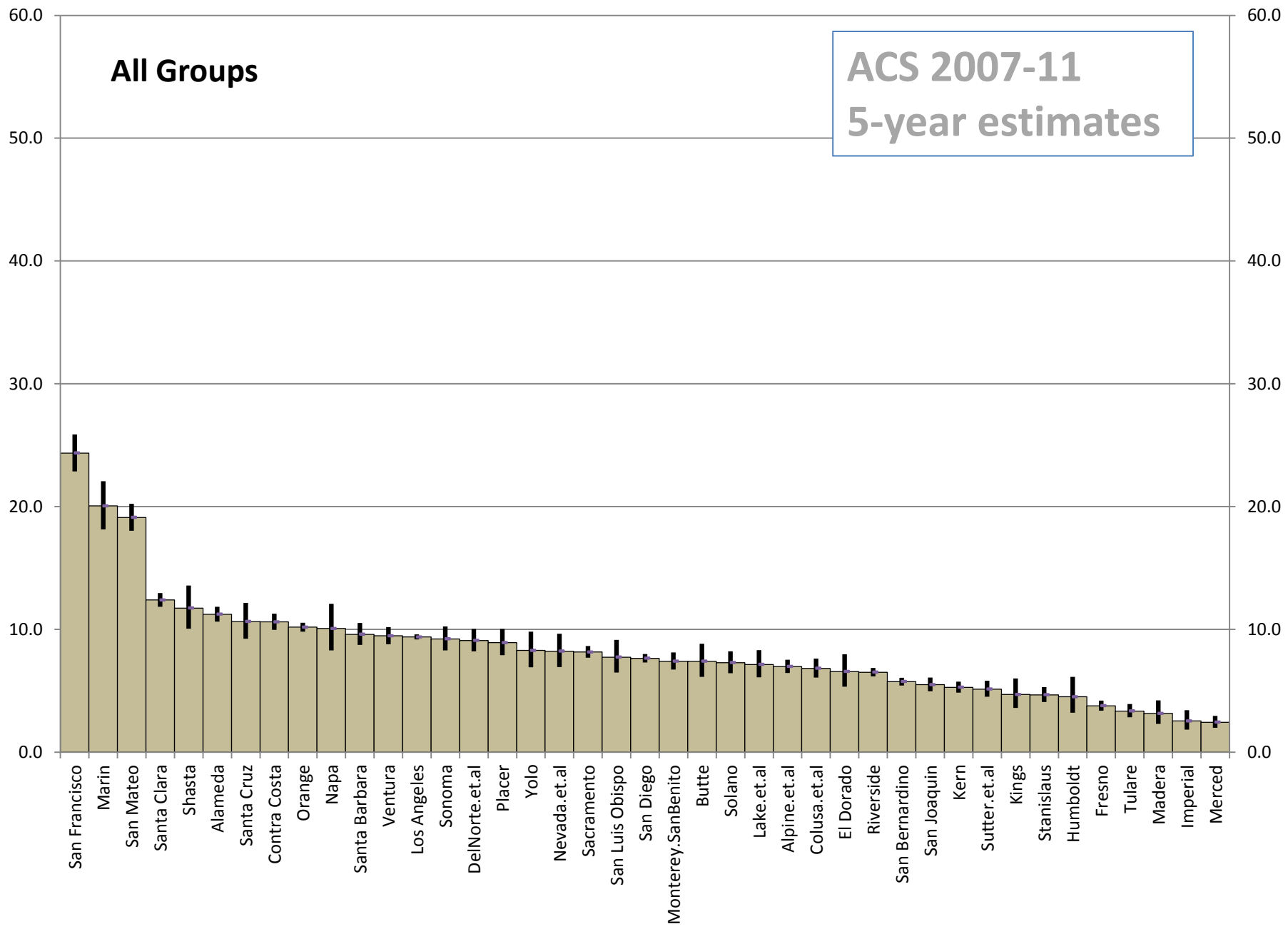
PUMAs matched to counties

Private K-12 enrollment rates estimated, along with confidence intervals, for:

- All groups, combined
- Whites alone
- Hispanics alone
- Blacks alone
- Other groups (not shown)

**All Groups**

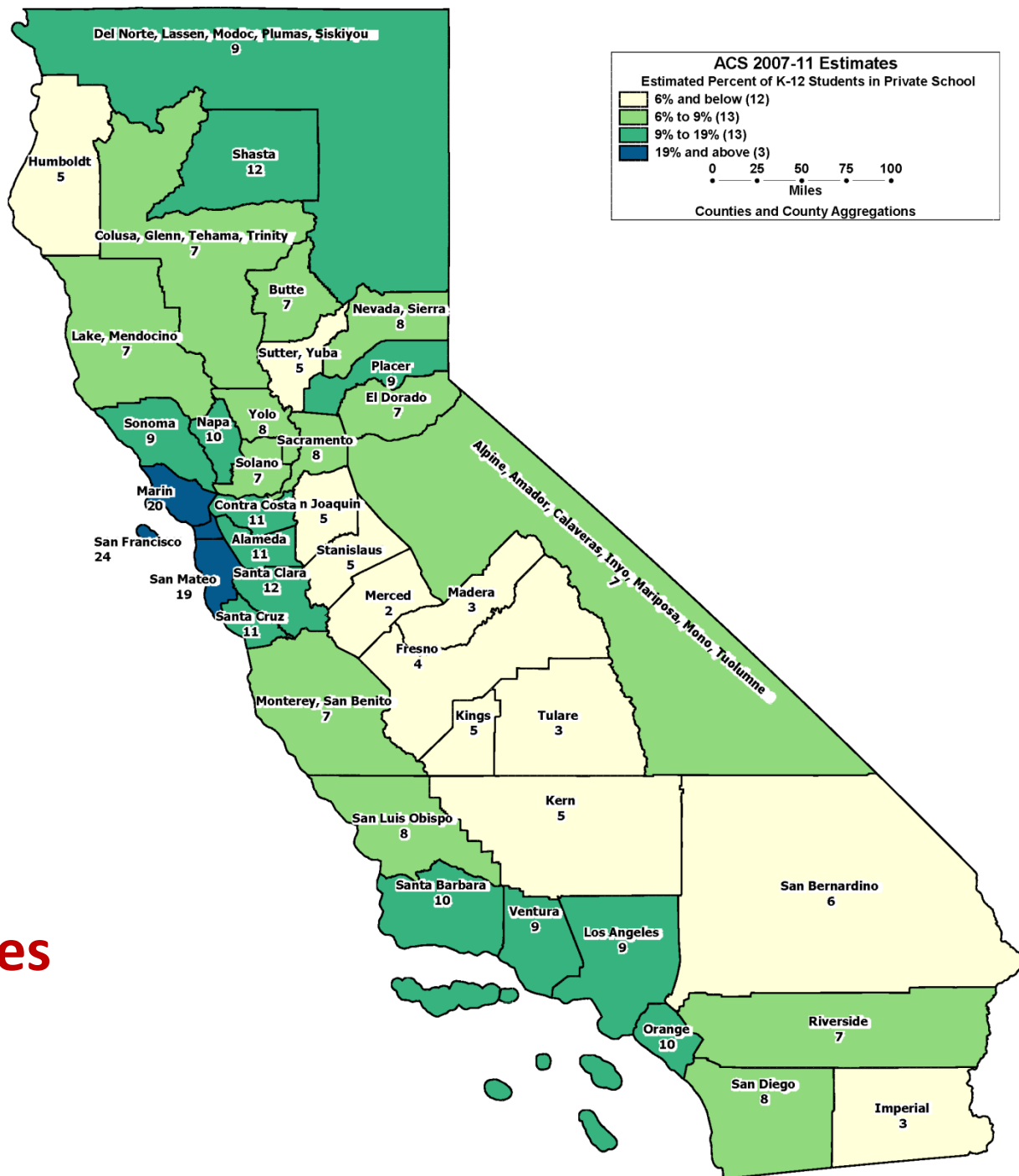
**ACS 2007-11**  
**5-year estimates**



# Map of estimated share of K-12 students enrolled in private school, by county/county group

ACS 2007-2011

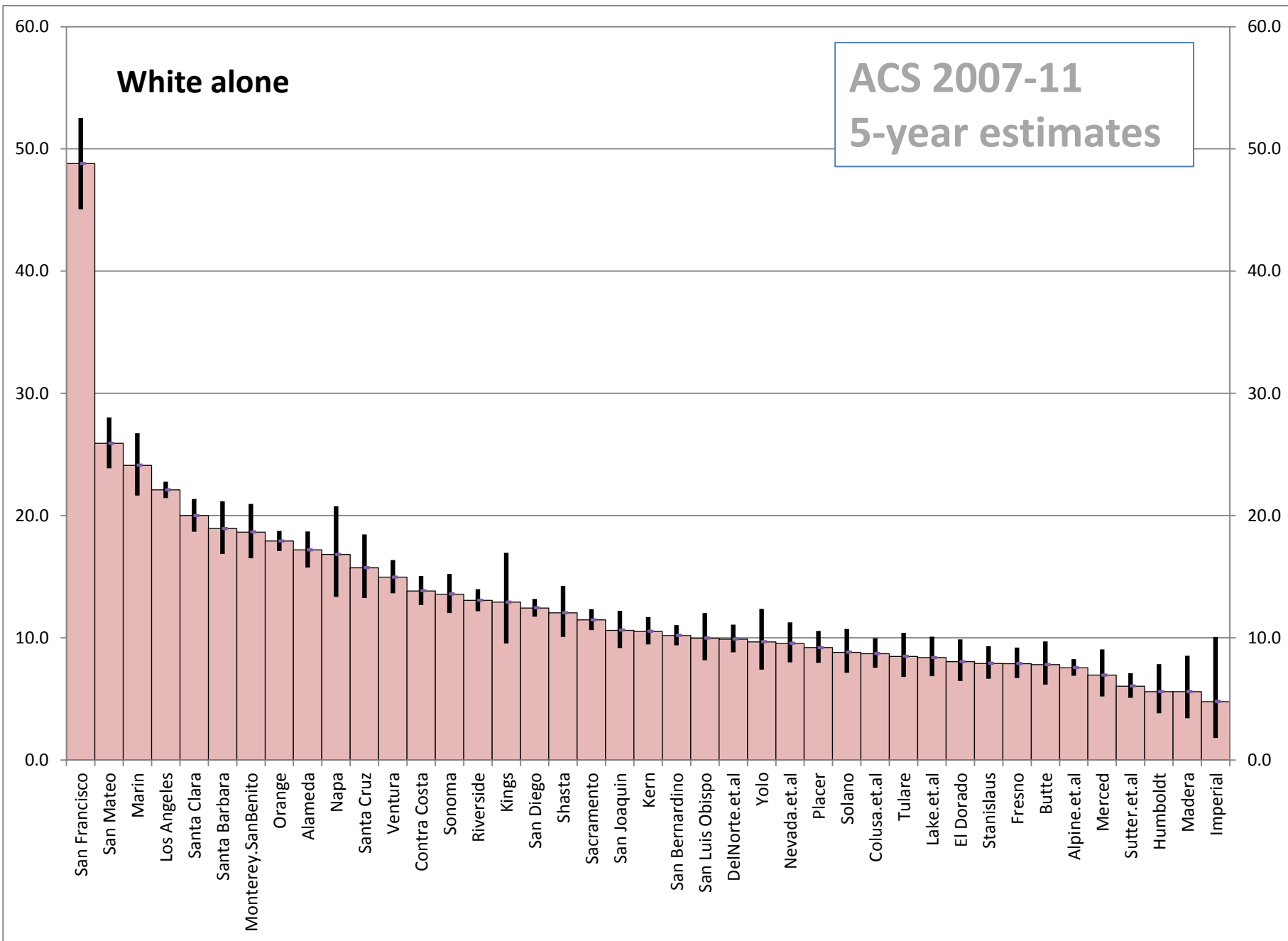
## Estimates of Private K-12 Enrollment Rates





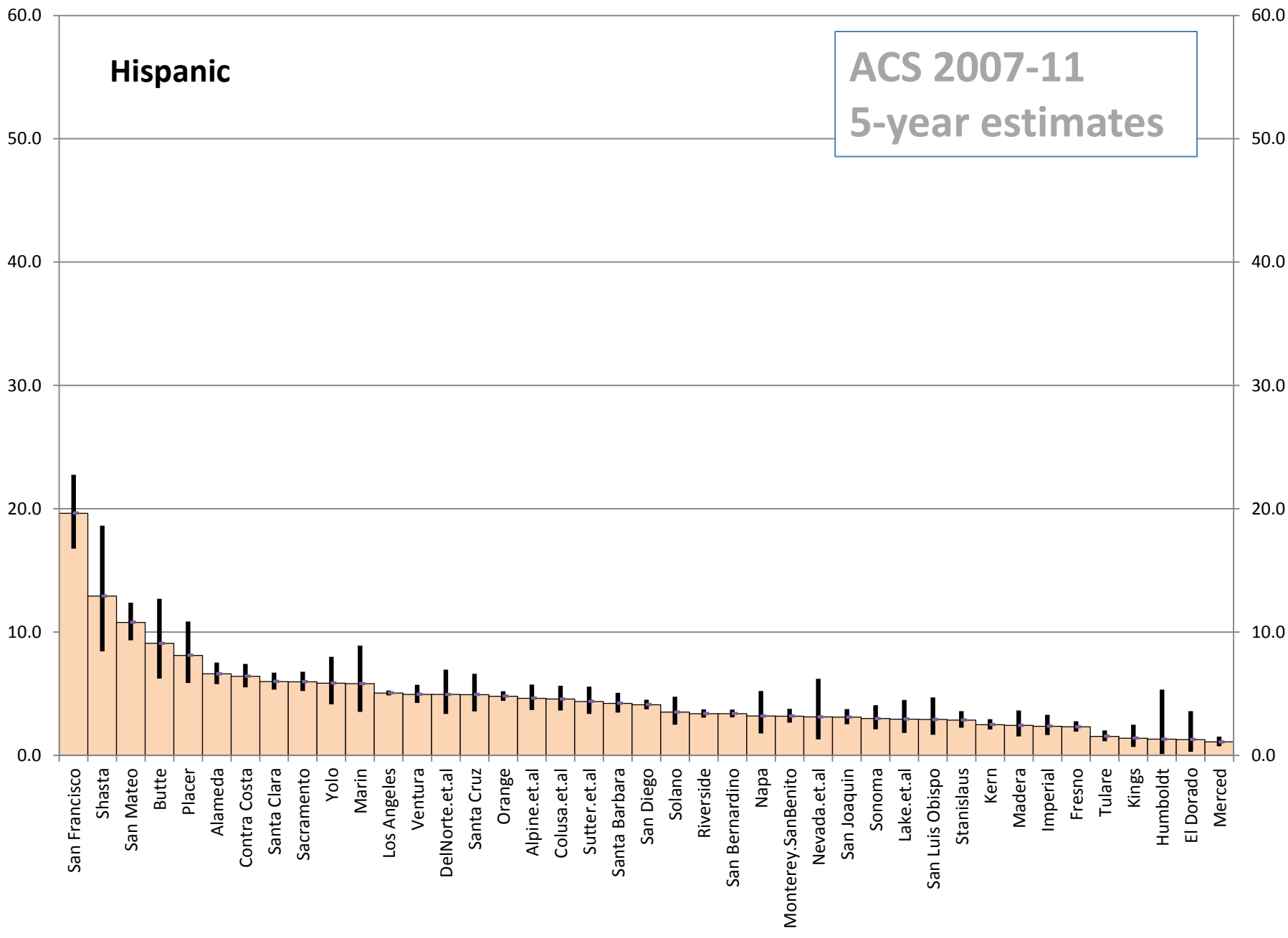
**White alone**

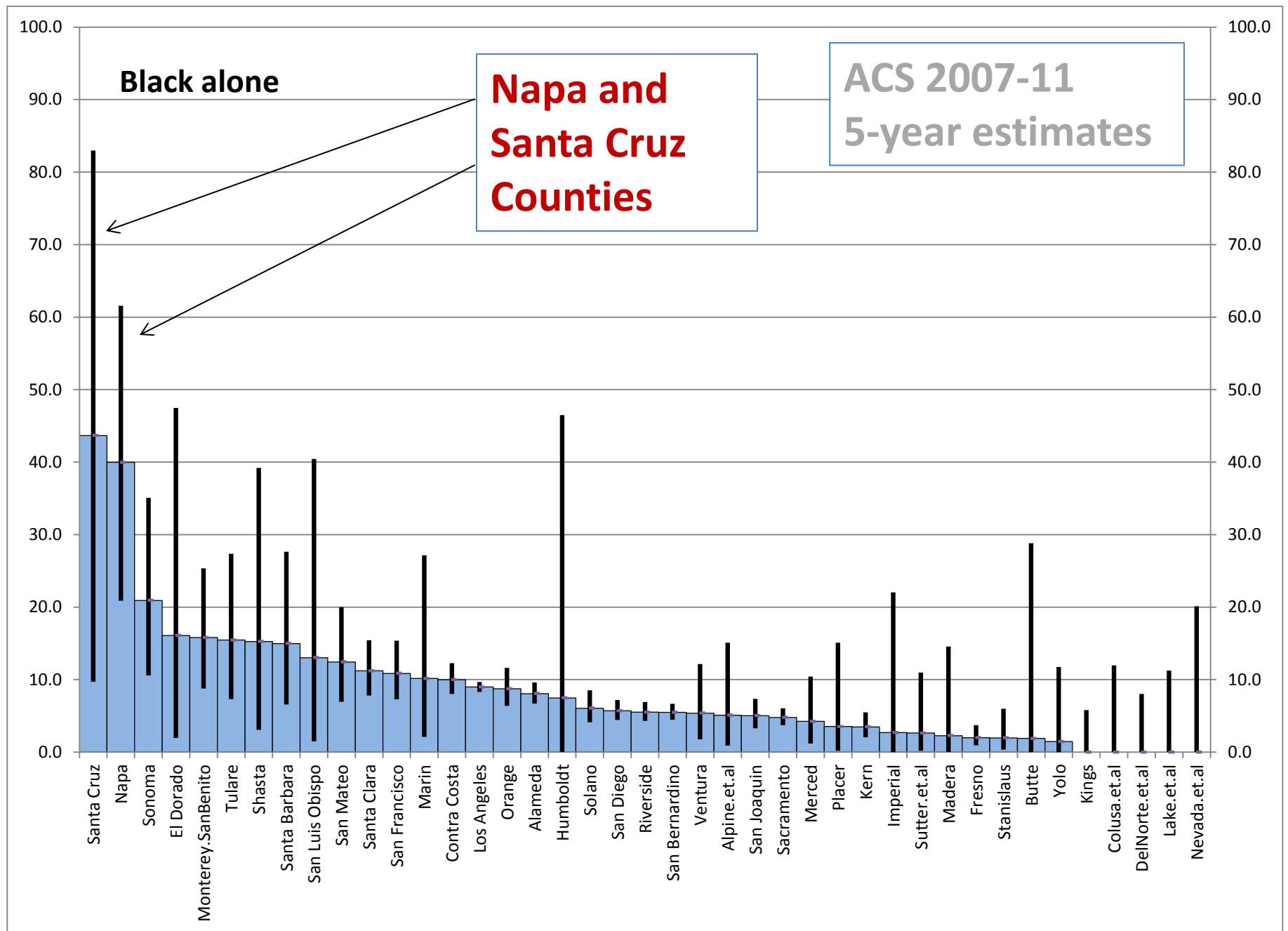
**ACS 2007-11**  
**5-year estimates**



Hispanic

ACS 2007-11  
5-year estimates

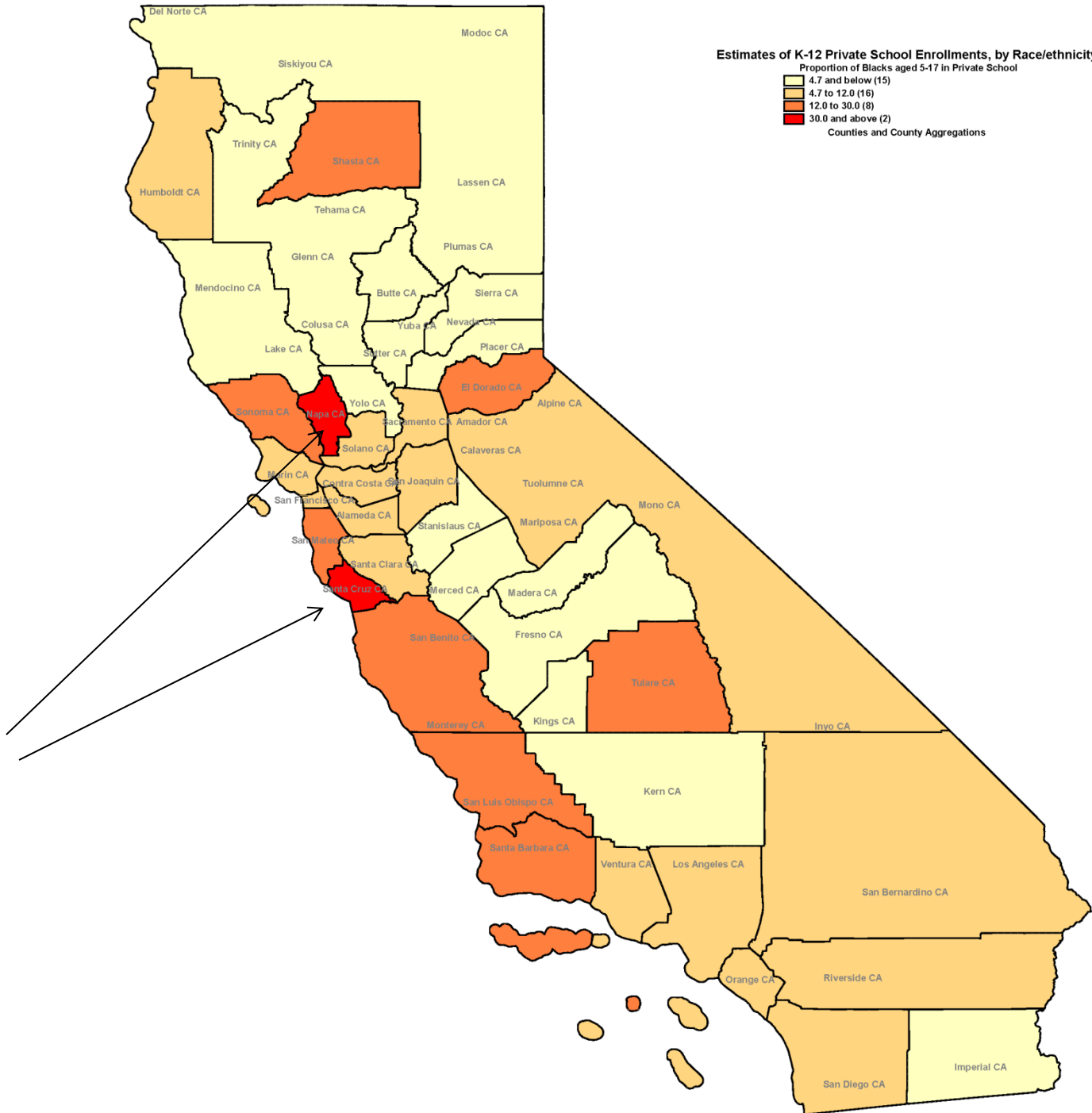




Map of estimated share of NH Black K-12 students enrolled in private school, by county/county group

ACS 2007-2011

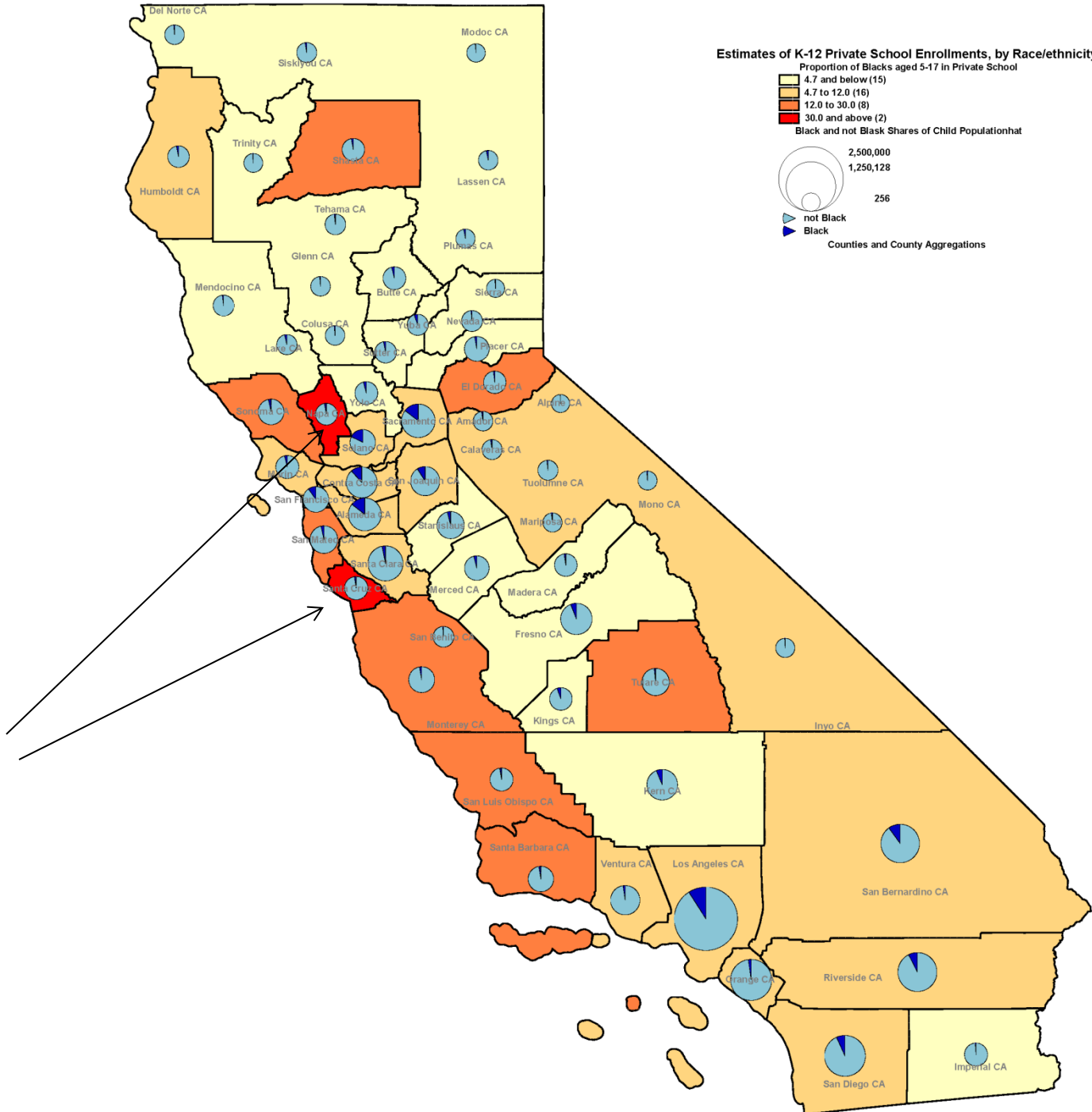
Counties with very high estimated Black rates (Napa and Santa Cruz)



# Map of estimated share of NH Black K-12 students enrolled in private school, by county/county group

ACS 2007-2011

Counties with very high estimated Black rates and small Black child population shares



# Results for 3-year ACS estimates

**2006-2008, 2008-2010 & 2009-2011 ACS estimates**

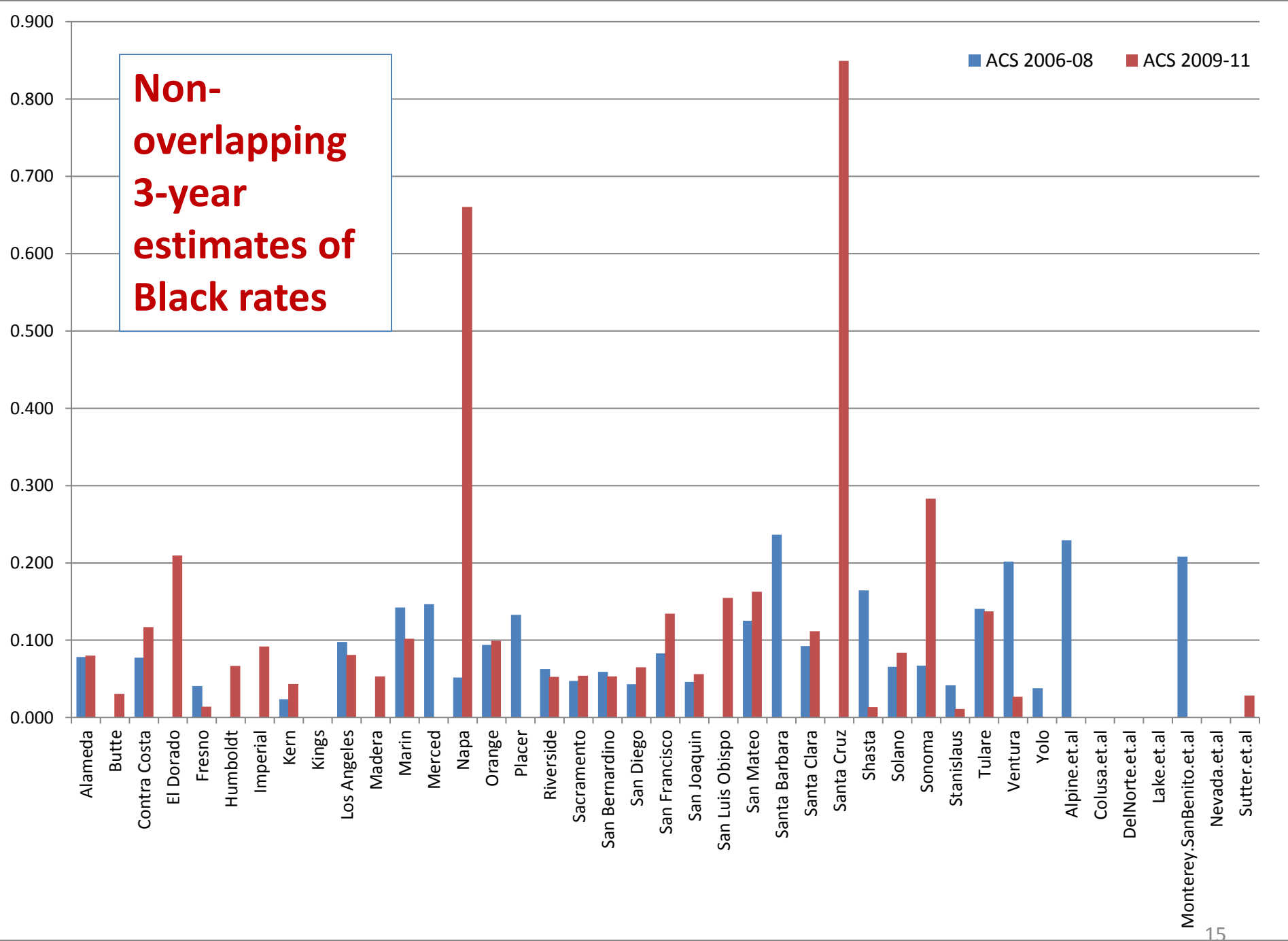
PUMS data; PUMAs matched to counties

The Census Bureau recommends comparing non-overlapping periods because of duplication of years of data (which complicates various kinds of computations).

However, we learned that there may be value in using overlapping periods in order to identify estimates that may be problematic.

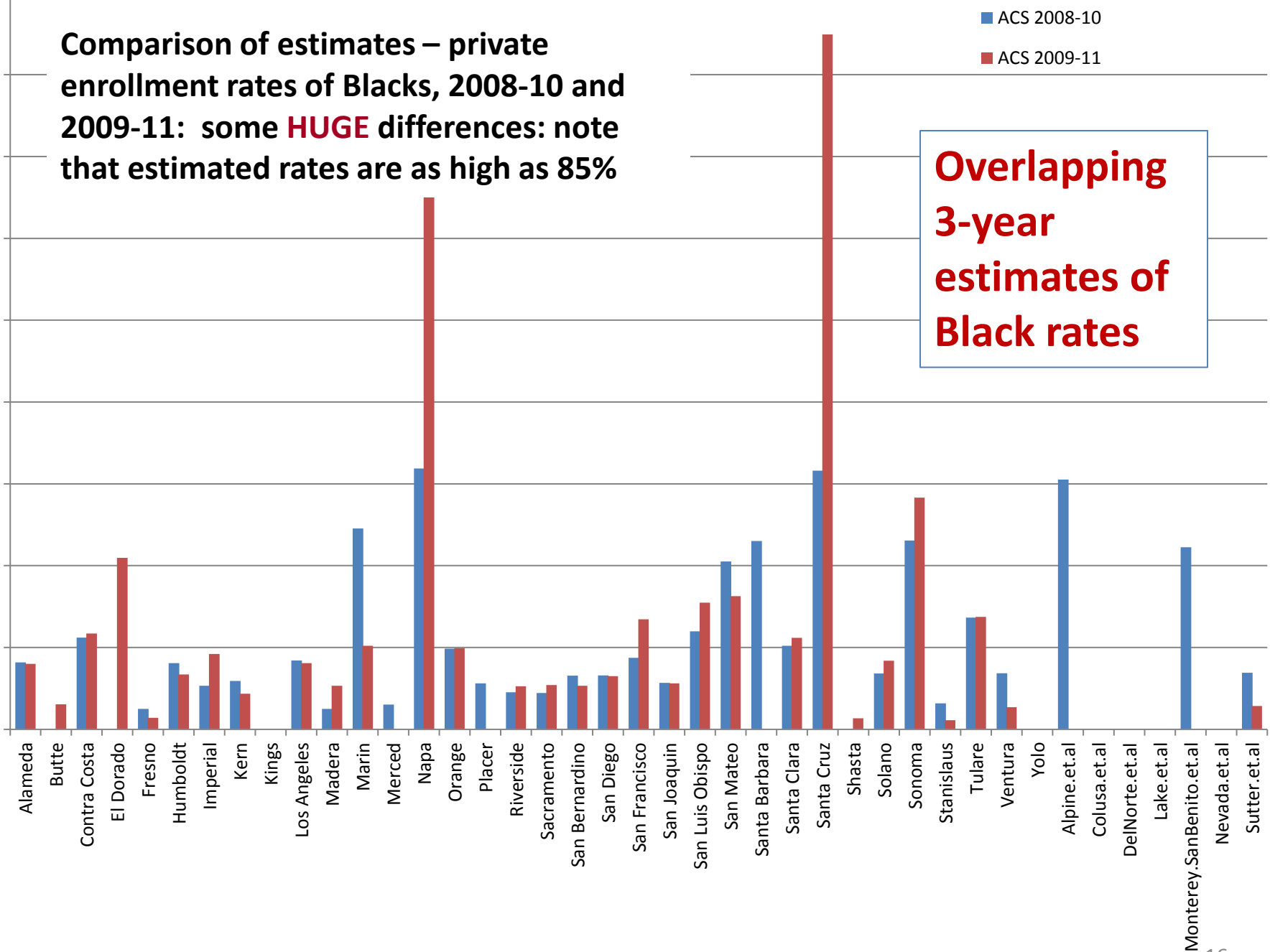
When we compare estimates from overlapping time periods, differences can be the result of :

- A true change in the rate
- Estimation error



**Comparison of estimates – private enrollment rates of Blacks, 2008-10 and 2009-11: some **HUGE** differences: note that estimated rates are as high as 85%**

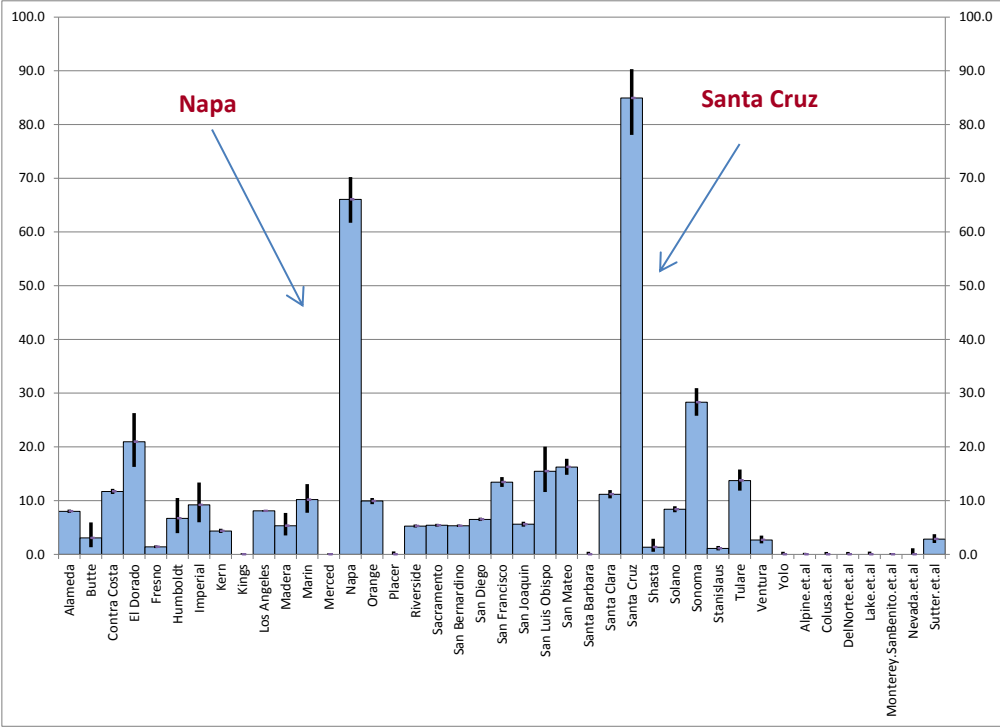
**Overlapping  
3-year  
estimates of  
Black rates**



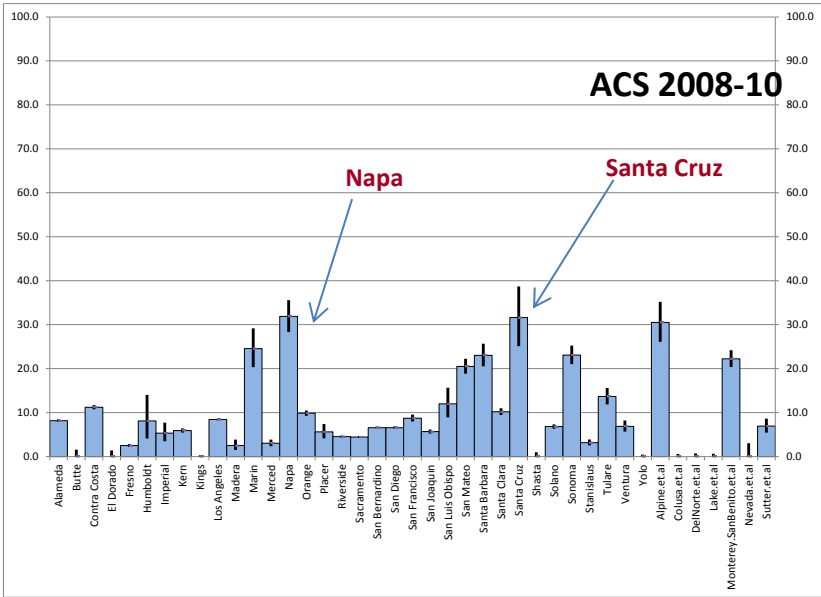


The confidence intervals for Black private rates for 2009-11 and 2008-10 didn't particularly signal problems with the estimates, but comparing the 2009-11 estimates with 2006-08 and 2008-10 raised a red flag.

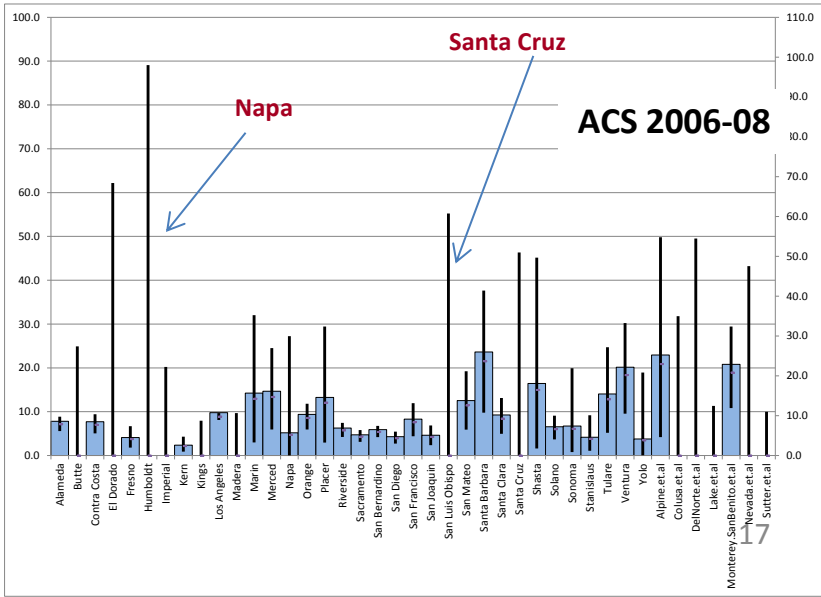
ACS 2009-11



ACS 2008-10



ACS 2006-08



Error margins for the 2006-08 estimates are huge

# Challenges and Questions

**We found some highly unlikely 5-year ACS estimates of private school enrollment rates, including 40% (Napa County) and 44% (Santa Cruz County) for Blacks .**

- Margins of error are large for small sub-groups in many counties, even ones with rather large total populations
- We probably can't believe these estimates.

**The 3-year ACS estimates are even more unlikely for areas with small sub-group populations**

- We shouldn't use them to measure trends, except perhaps for all groups combined or for geographies with much larger populations

**Would tests of statistical significance help us know what to believe?**

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