A Closer Look at the Quality of Small Area Estimates from The American Community Survey

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The Charge for ACS

- To replace the decennial census sample
- To produce reasonable, accurate, reliable, and consistent data

Overview

- Background
- Survey Errors
- Results
- Conclusions

History of the Census Sample

Census	Sampling Rates	Expected Sample	Actual Sample
1940	5%	5%	N/A
1950	20%	20%	19.95%
1960	20% and 5%	25%	24.5%
1970	15% and 5%	20%	19.6%
1980	1:2 and 1:6	19.8%	18.4%
1990	1:2; 1:6; 1:8	17.6%	16.0%
2000	1:2; 1:4; 1:6; 1:8	17.3%	15.8%

The ACS Design

- Mirrors the Census 2000 differential systematic sampling
- Uses the best mail procedures
- Uses the best interviewing methods

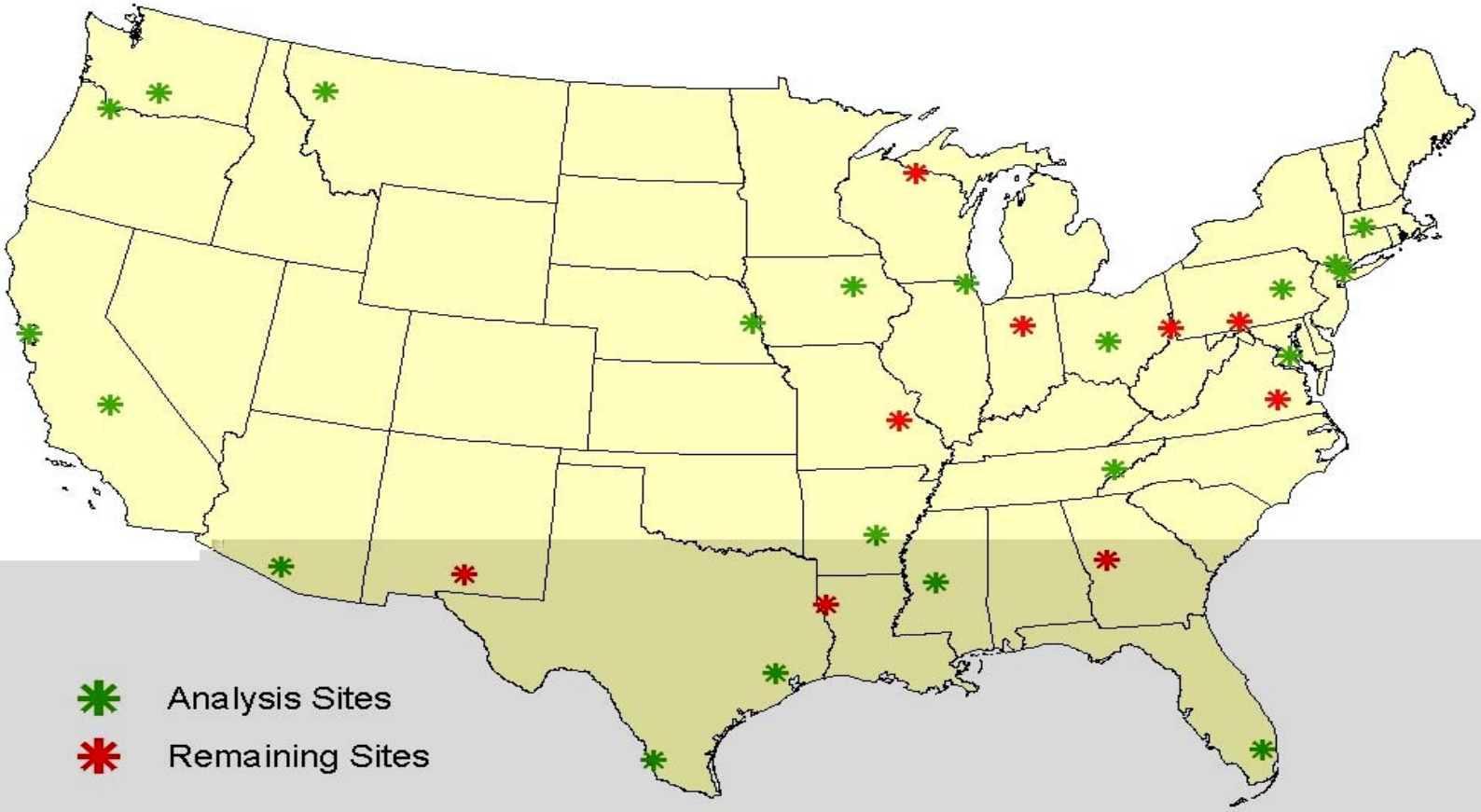
Sample Survey Error

- Sampling Error: affected by sample design, sample size, and the extent of nonresponse
- Nonsampling Error: affected by nonresponse, measurement, processing, and coverage
- Purpose: to establish the relationship between levels of nonresponse in ACS and the census sample

Measures for Comparison

- Unit Nonresponse to overall samples
- Item Nonresponse to individual questions
- Noninterview and Proxy rates for non-mail components
- Self-Response Rate

American Community Survey Test Sites



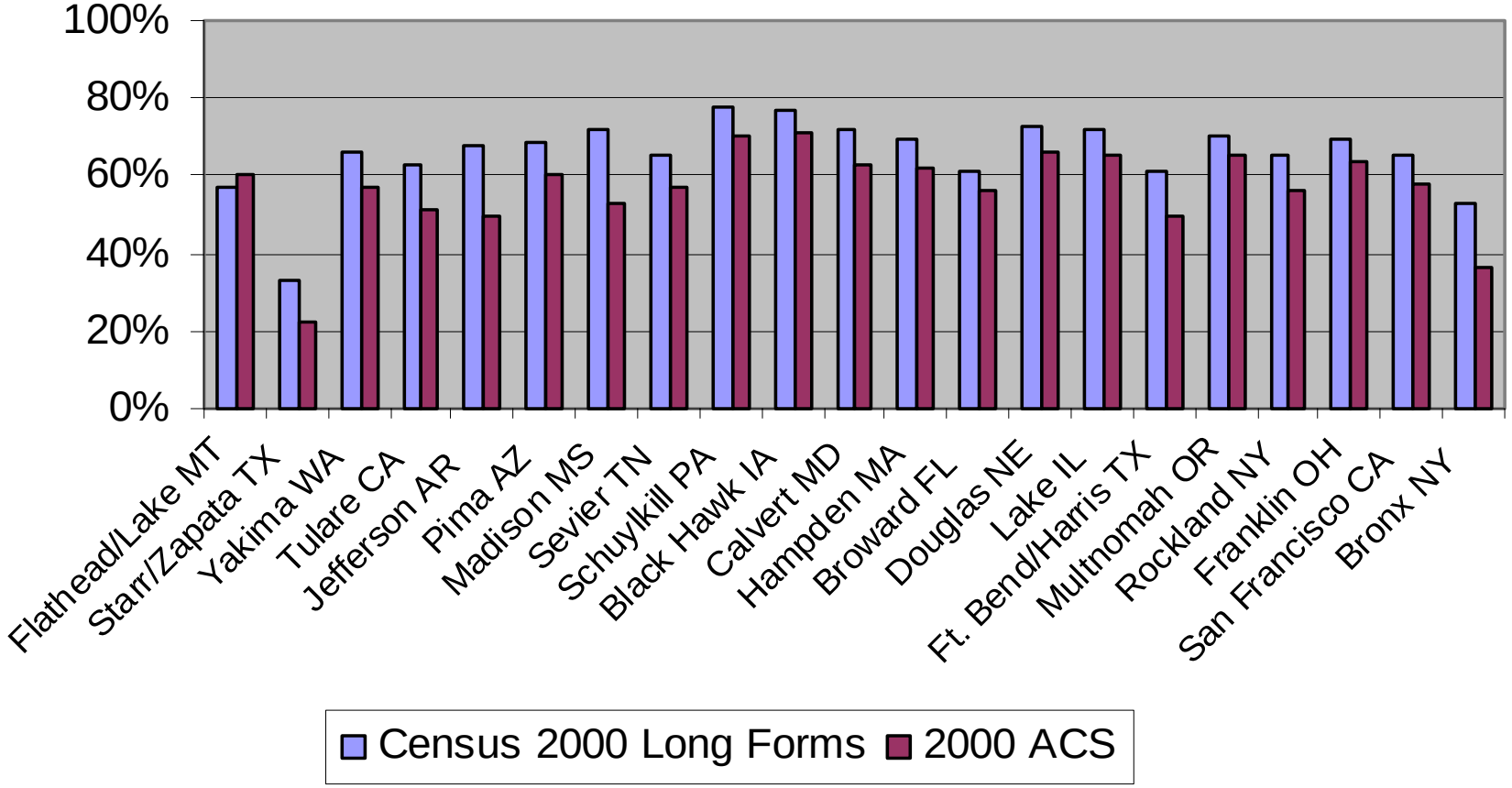
What to Look For

- How the levels of response and nonresponse in the ACS compare to the Census 2000 long form sample.
- How these levels vary across the sites

The Role of Self-Response

- To control the introduction of biases into the data by interviewers/enumerators
- To allow respondents to answer questions privately, with time to refer to records
- To reduce the cost of survey data collection

Self-Response Rates



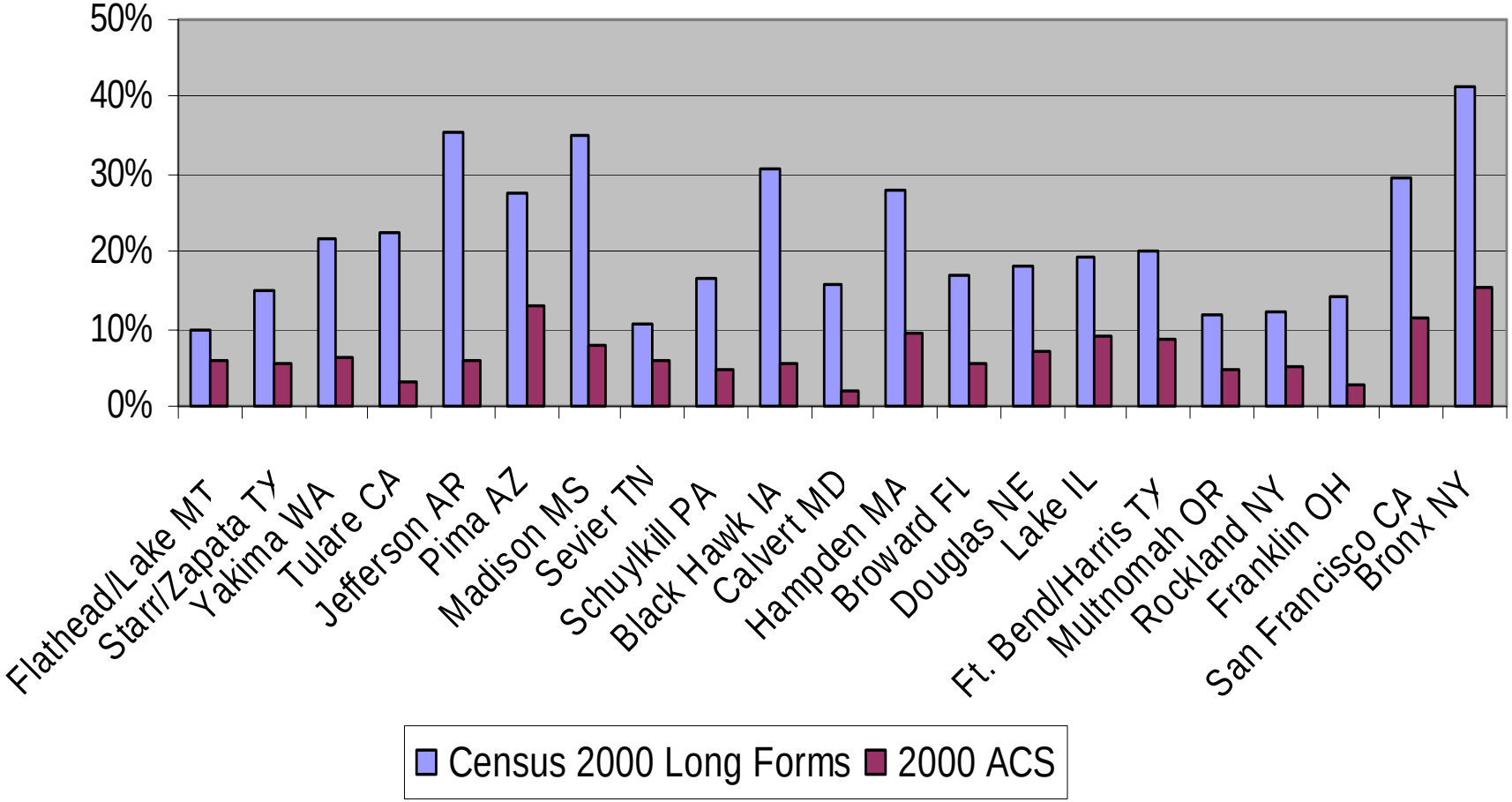
Self-Response Findings

- As expected, the ACS self-response rate is lower than Census 2000 long form self-response
- The quality of ACS estimates depends on the success of nonresponse follow-up operations

Noninterviews

- No interview conducted, or less than the required minimal amount of information is collected
- Mail return units are rarely noninterviews
- Noninterview rate is an indicator of follow-up data accuracy

Follow-up Noninterview Rates



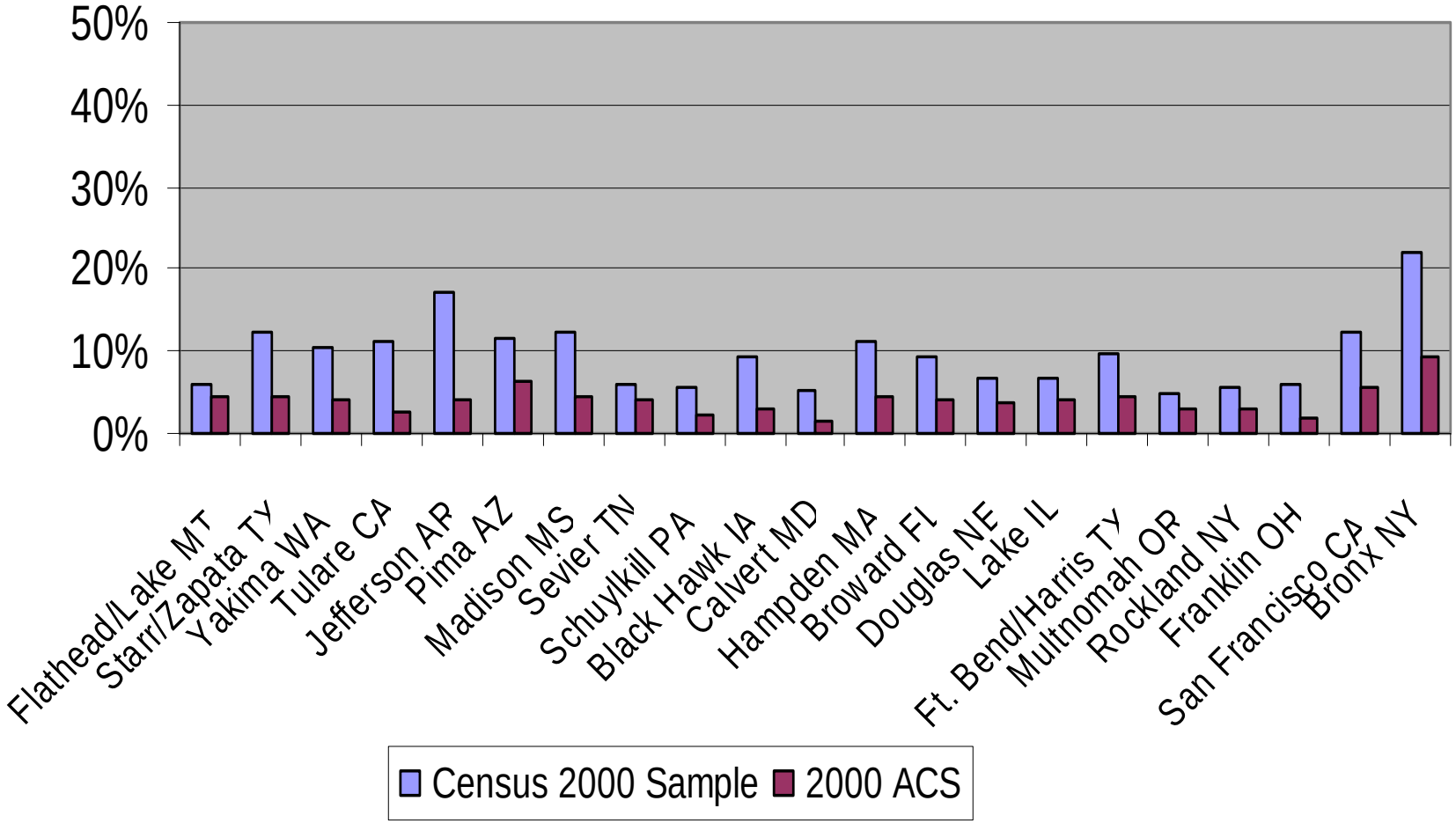
Follow-up Findings

- ACS follow-up noninterview rate is lower than Census 2000 long form rate in every site
- ACS noninterview rate is more consistent across sites than census long form noninterview rate
- Acceptance of proxy data in census increases the non-sampling error potential

Unit Nonresponse

- Most commonly used measure of overall survey data collection success
- Level is an indicator of bias potential
- Can vary widely from area to area
- Impacts the quality of all estimates

Total Unit Nonresponse Rates



Unit Nonresponse Findings

- ACS unit nonresponse consistently below that of Census 2000 sample
- Little difference between ACS unit nonresponse from site to site regardless of demographics, except for the Bronx

Impact of Unit Nonresponse

- Increases potential for bias in the results
  - Characteristics of nonresponse units are not known
  - Nearly all noninterview units in both ACS and census are in the follow-up universe
  - Characteristics of interviewed mail return and follow-up units are known and are different

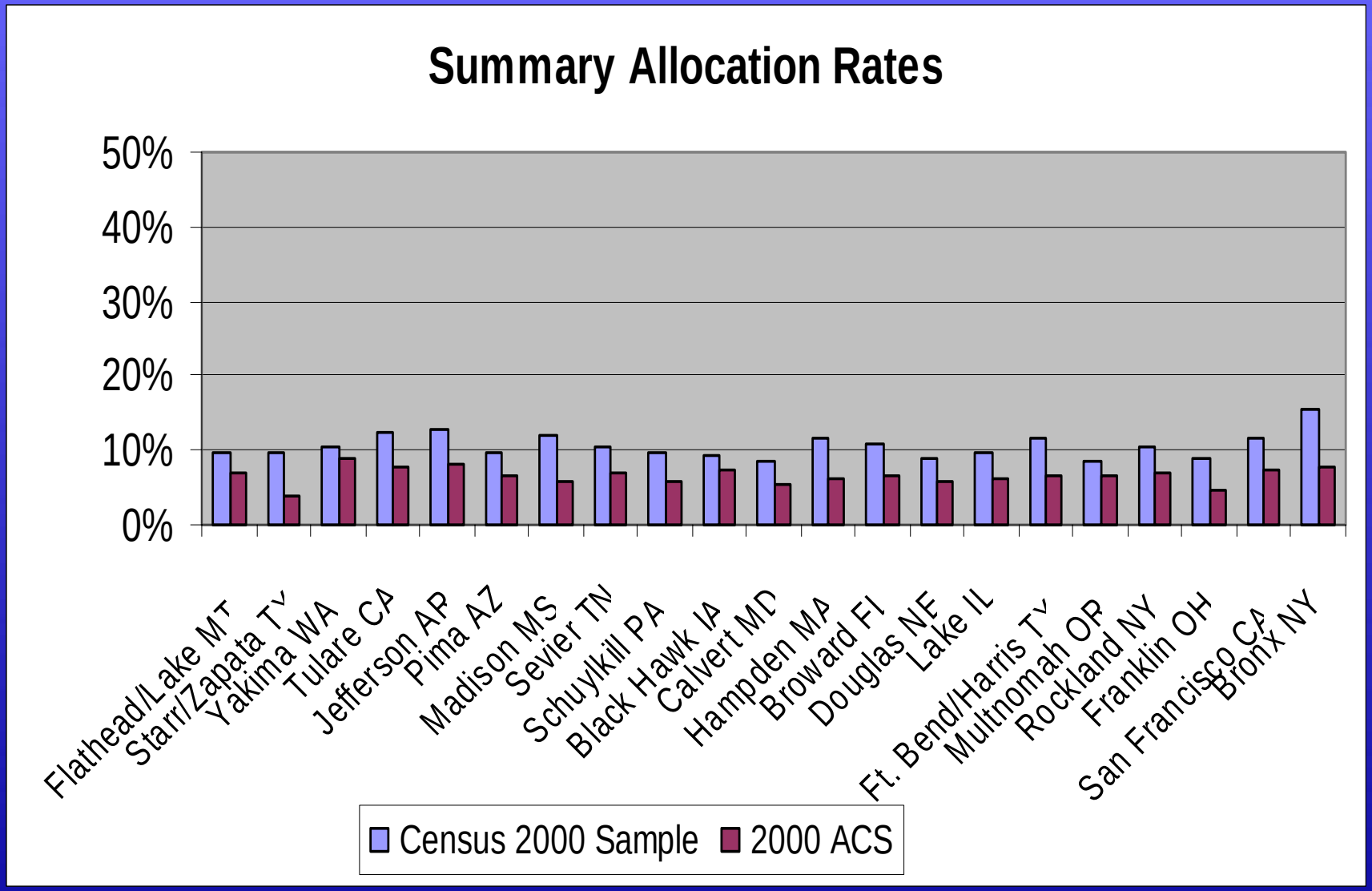
Item Nonresponse

- Can be a greater threat to individual survey distributions than unit nonresponse
- Imputation methods can distort results if too much data are missing
- Allocation rates are used to measure item nonresponse levels

The Summary Allocation Rate

- An overall measure of the amount of required data that was not collected in each site
- Based on 54 population items and 29 housing items

Total allocations made to all items /
Total required answers


Summary Allocation Rates
50%
40%
30%
20%
10%
0%
Flathead/Lake MT
Starr/Zapata TX
Yakima WA
Tulare CA
Jefferson AR
Pima AZ
Madison MS
Sevier TN
Schuylkill PA
Black Hawk IA
Calvert MD
Hampden MA
Broward FL
Douglas NE
Lake IL
Ft. Bend/Harris TX
Multnomah OR
Rockland NY
Franklin OH
San Francisco CA
Bronx NY
Census 2000 Sample
2000 ACS

Item Nonresponse Findings

- Overall item nonresponse in every site is lower in ACS than in the Census 2000 sample
- ACS allocation rates are more consistent across sites than the census sample rates, regardless of demographics

Final Thoughts

- Use unit and item nonresponse, as well as level of proxies, to judge overall survey accuracy
- Nonresponse error concentrated in specific collection modes is not randomly missing, and increases potential biases
- More time and effort should be devoted to measuring non-sampling error

Conclusions

- Sampling error on ACS estimates will be higher than on census sample estimates
- Nonresponse-related non-sampling error on ACS estimates will be lower than on census sample estimates
- Total non-sampling error on ACS estimates will most likely be more consistent across all types of areas than on census sample estimates
- Chip, you were right!