ACS Statistical Issues and Challenges: One-, Three-, and Five-year Period Estimates

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Multi-year Estimates

- Conceptualization
- Estimation Process
- Geographic Definitions
- Inflation Adjustment
- Multi-Year Estimates Study

Conceptualization

- ACS - Period Estimates
  - First 5-year 2005-2009 represents the period
- Other Options Considered
  - Estimate of 2007 (middle year)
  - Estimate of 2009 (most recent year)

Conceptualization

- Construct of 1-year estimates
  - Reflect each of the 12 months equally
  - No month given preference
  - No more weight given to a month (middle nor last)
- Multi-year estimates
  - 3-year represents 36 month period
  - 5-year represents 60 month period

Estimation Process

- Each year data weighted for 1-year
  - Several weighting adjustment factors
  - Controls to housing unit and population estimates
- Multi-year – 2 possible methods
  - Simple or weighted average of 1-year
  - Pool the data and apply final weighting factors

Advantages of Pooling

- Improved accuracy – Increase in sample cases for adjustment cells
- More up-to-date housing unit and population estimates
- Flexibility in developing weighting procedures
- Production of multi-year mirrors 1-year systems

Population controls

- Not a single-year's estimates
- Simple average of the one-year population estimates – period control
- Use most recent vintage
- Example 2005-2007 – average of the 2005, 2006, and 2007 estimates produced using the 2007 methodology

Geographic Definitions

- Updated on annual basis
- 1-year estimates
  - Use definitions exist as of January
  - Submitted by April
- Multi-year estimates
  - Geographic definitions will change
  - Decision to use most recent definition

Geographic Definition – Example

- 2005-2009 estimate
- Town annexes a set of blocks in 2007
- All sample cases will be tabulated using the 2009 definition
- Include 2005 and 2006 sample cases that were not part of the town when interviewed

Geographic Definition – Factors

- ACS reflect most current definition
- Greater geographic consistency with intercensal housing unit and population time series
- No meaningful construct for “average” geographic definition

Inflation Adjustment

- ACS dollar-value responses referenced to month of interview
- Reference period shifts throughout year
- 1-year estimates
  - Adjustment factors applied to monthly values
  - "Anchor" to the calendar year of interview
  - National level CPI from Bureau of Labor Statistics

Inflation Adjustment

- Extension of logic to multi-year
- Adjust the values from the period to last calendar year of the period
- Compute and apply calendar-year - to - calendar-year factors
- 2005-2009 estimates would be in 2009 calendar year constant dollars

Multi-Year Estimates Study

- Prepare for 2008 production and release of multi-year estimates
  - Produced 14 sets of 1-year, 3-year, and 5-year estimates for a specific set of geographic areas in 34 of the ACS test counties
  - Released profiles showing demographic, social, economic, and housing information
- Website:
- http://www.census.gov/acs/www/AdvMeth/Multi_Year_Estimates/overview.html

Overview

- Main issue: Choices
- Key concepts for data users

Issue: Users Have Choices which data to use

- Population < 20,000
  - 5-year estimates only
- Population >= 20,000 and < 65,000
  - 3-year estimates
  - 5-year estimates
- Population >= 65,000
  - 1-year estimates
  - 3-year estimates
  - 5-year estimates

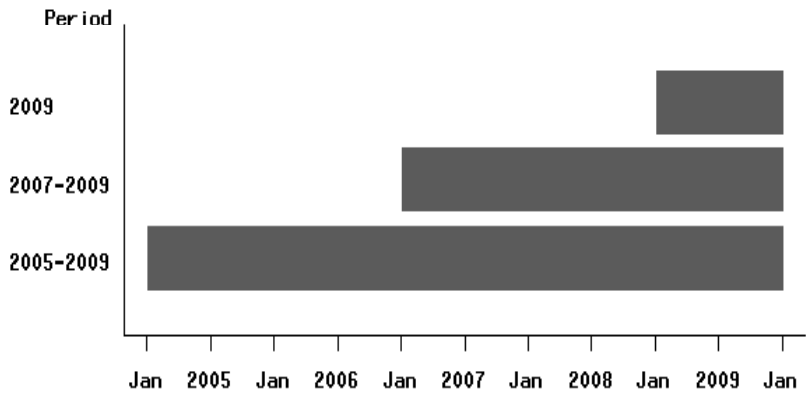
Some Key Concepts for Data Users

- Reliability versus currency
- Comparisons overlapping time periods
- Subgroups versus total group

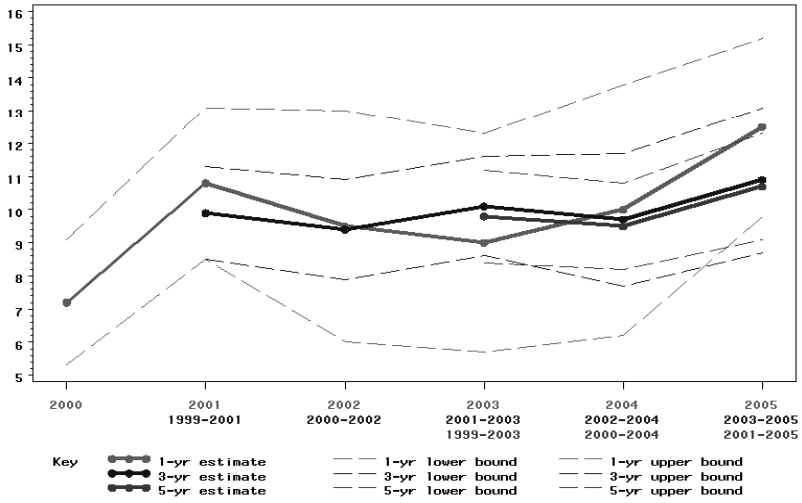
Examples From the Multi-Year Estimates Study

- Data collected from 1999 to 2005 for 34 test counties.
- Available for download on ACS web site.
  http://www.census.gov/acs/www

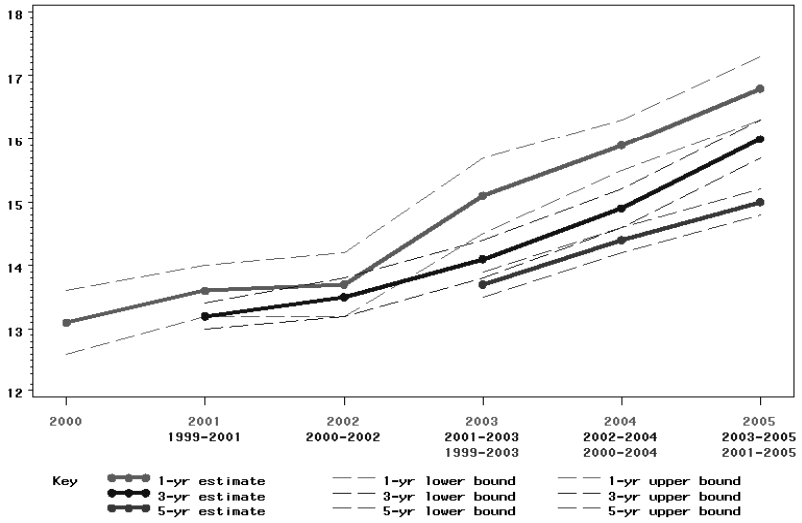
Reliability Versus Currency



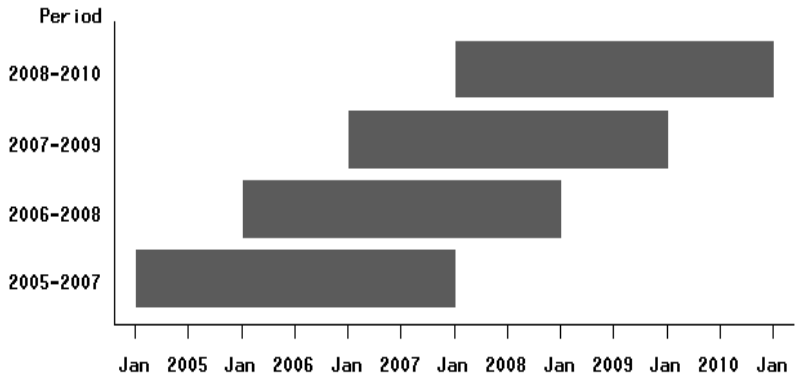
Percent Poverty for Families – Sevier County TN



Percent Who Speak Spanish at Home – Lake Co. IL

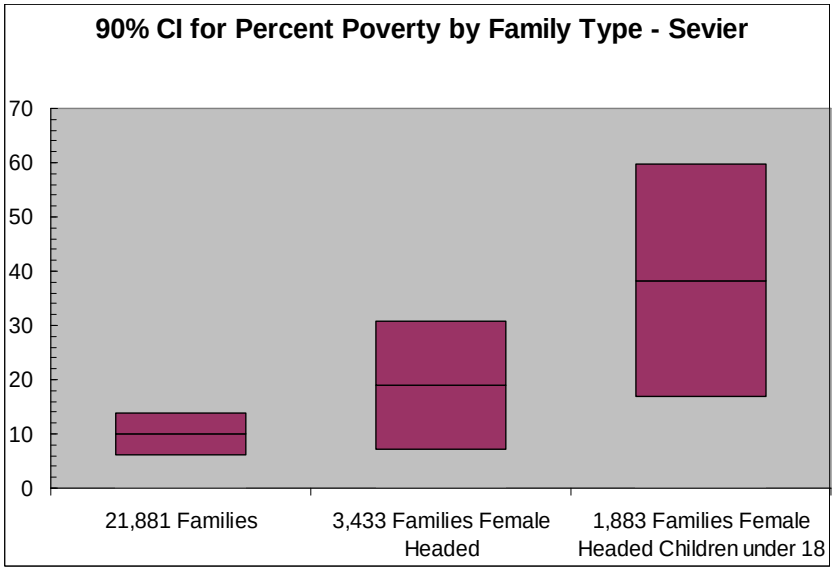


Overlapping vs Non-Overlapping Time Periods



Subgroups Example: Family Types Sevier Co.

Group	Size
All Families	21,881
Families with Female householder, no husband	3,433
Families with Female householder, no husband, children under 18	1,883



Conclusion

- MYEs new product, new choices, new concepts for data users
- Users guidelines ready for 2008 release of first MYE
- Contact:

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Key Events for Multi-Year Estimates

- 2008 First Release of Three-Year Multi-Year Estimates (MYE) 2005-2007
- 2010 First Release of Five-Year MYE 2005-2009
- Five-Year MYE – used in same way as Decennial Long Form

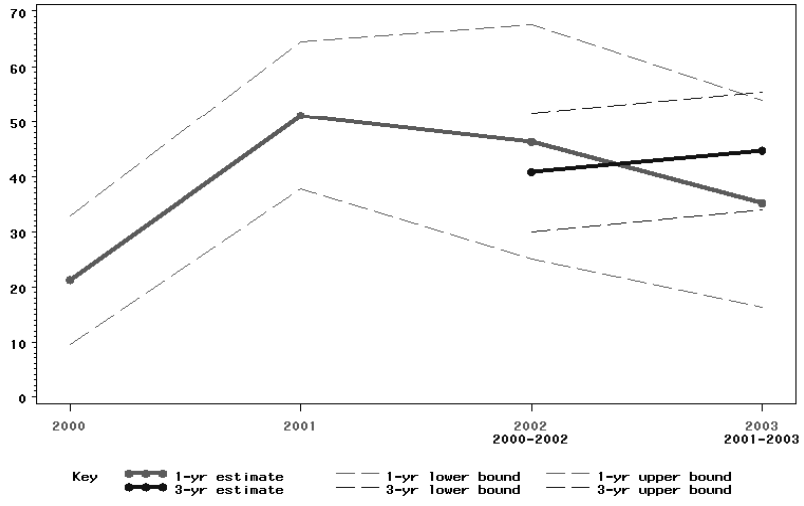
Purpose - Continued

- Developing User Guidelines
  - Target less technical users
  - On ACS website
- Paper is a first step in this development
- Illustrate some statistical issues for guidelines

Previous Work

- Committee on National Statistics (2007). “Using the American Community Survey: Benefits and Challenges”.
- Taeuber, C.M. (2006). “American Community Survey for Community Planning”

Overlapping Periods - Percent Poverty Female-Headed Families w/ Children Under 18 – Sevier Co.



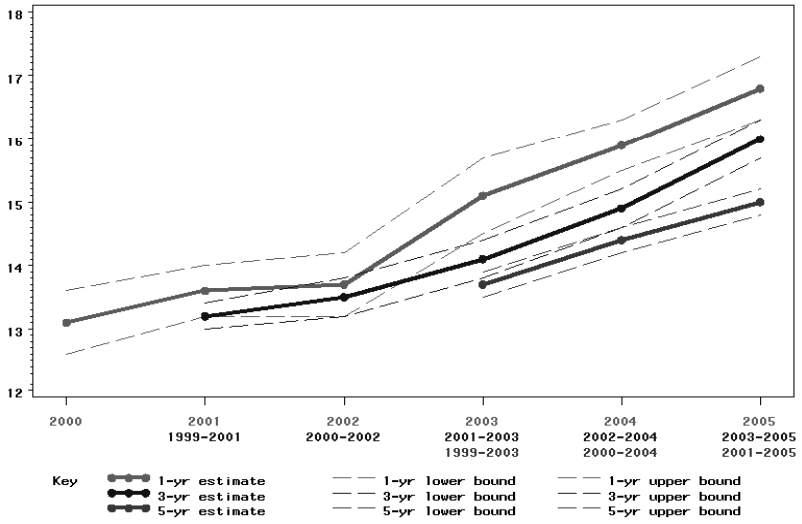
Comparisons of Estimates of Overlapping Periods

- Hard to interpret – Don't do it
- Difference equals difference of nonoverlapping years

Smoothing

- Overlapping MYEs may be useful for smoothing.
- Capture patterns over time while smoothing out noise.
- MYEs similar to moving averages.

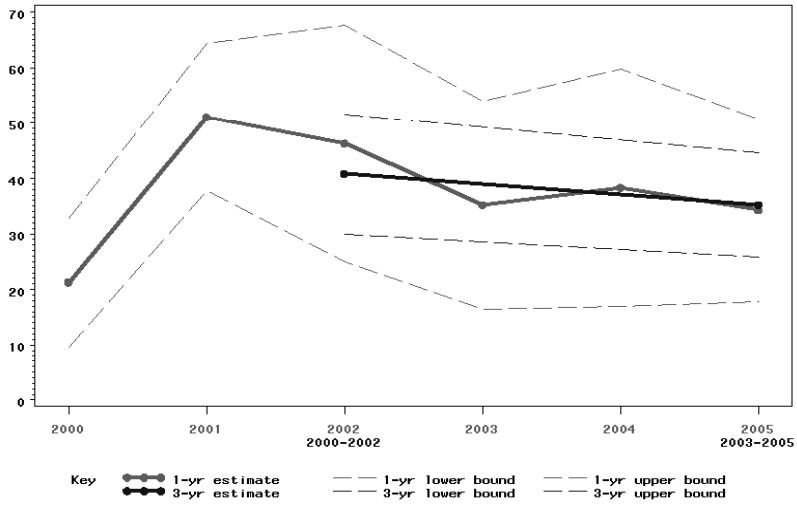
Percent Who Speak Spanish at Home – Lake Co. IL



Non-Overlapping Comparisons

- Encourage users to compare non-overlapping time periods.
- Interpretation is straightforward.

Nonoverlapping Periods - Percent Poverty Female-Headed Families w/ Children Under 18 – Sevier Co.



Subgroups

- Demographically Defined Subsets of a Geographic Entity

Subgroups in Summary

- Size of confidence intervals & S.E.s can get large with subgroups
- Caution – geographic entity may support 1-year estimate, but subgroup may not
- Data Users – Look at Standard Errors!