THE QUALITY OF ESTIMATES FROM THE AMERICAN COMMUNITY SURVEY FOR SMALL POPULATION GROUPS

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U S C E N S U S B U R E A U

Issues and Concerns

- ACS Sample Size

- Interpretation of Multi –year Averages

- Reliability of ACS Estimates due to Sample Design Differences

- Are Small Samples Representative?

Census Long Form and American Community Survey

- American Community Survey will replace the 2010 long form

- Topics mandated or required by federal law

American Community Survey Design (starting 2005)

- Annual sample of 3 million addresses
- A new panel each month
- Mail with telephone follow-up
- Personal follow-up of a one-third sample
- Use of differential sampling based on size
- Over-sampling low mail response areas

Data Products to Replace Long Form

- 5 year averages starting 2010
  - replace census summary files
  - typical standard errors are larger than corresponding long form standard errors
  - updated each year

Other Data Products

- Annual averages published for areas of 65,000+ population

- 3 year averages for 20,000+

- Annual averages for smaller areas released for "research purposes"

- Public Use Files (PUMS)

American Community Survey and the Inter-Censal Estimates

- ACS is a continuous source of information for updating the Population Estimates

- Will provide some information on county-to county migration

- Improvements will be achieved for all major race and ethnic groups listed on the census short form

Weighting and Population Controls

- American Community Survey can provide more race and detail than the intercensal population estimates

- American Community Survey will improve the quality of demographic estimates

Issues About Sample Size

- Small Area or Small Population Group
  - 400 People
  - Group of People with a Specific Characteristic
  - People who use a Language Other than English at Home
  - Relatively High Standard Error

Question 1

What is the Impact of Having a Smaller ACS Sample?

- Larger Standard Errors
- Larger Confidence Intervals
- Data may be too noisy for some uses but adequate for other purposes.

U S C E N S U S B U R E A U

Effect on Margin of Error

What is the Impact of Having a Smaller ACS Sample?

90 Percent Confidence Interval

2010 Census Long Form   ACS (2008-12)
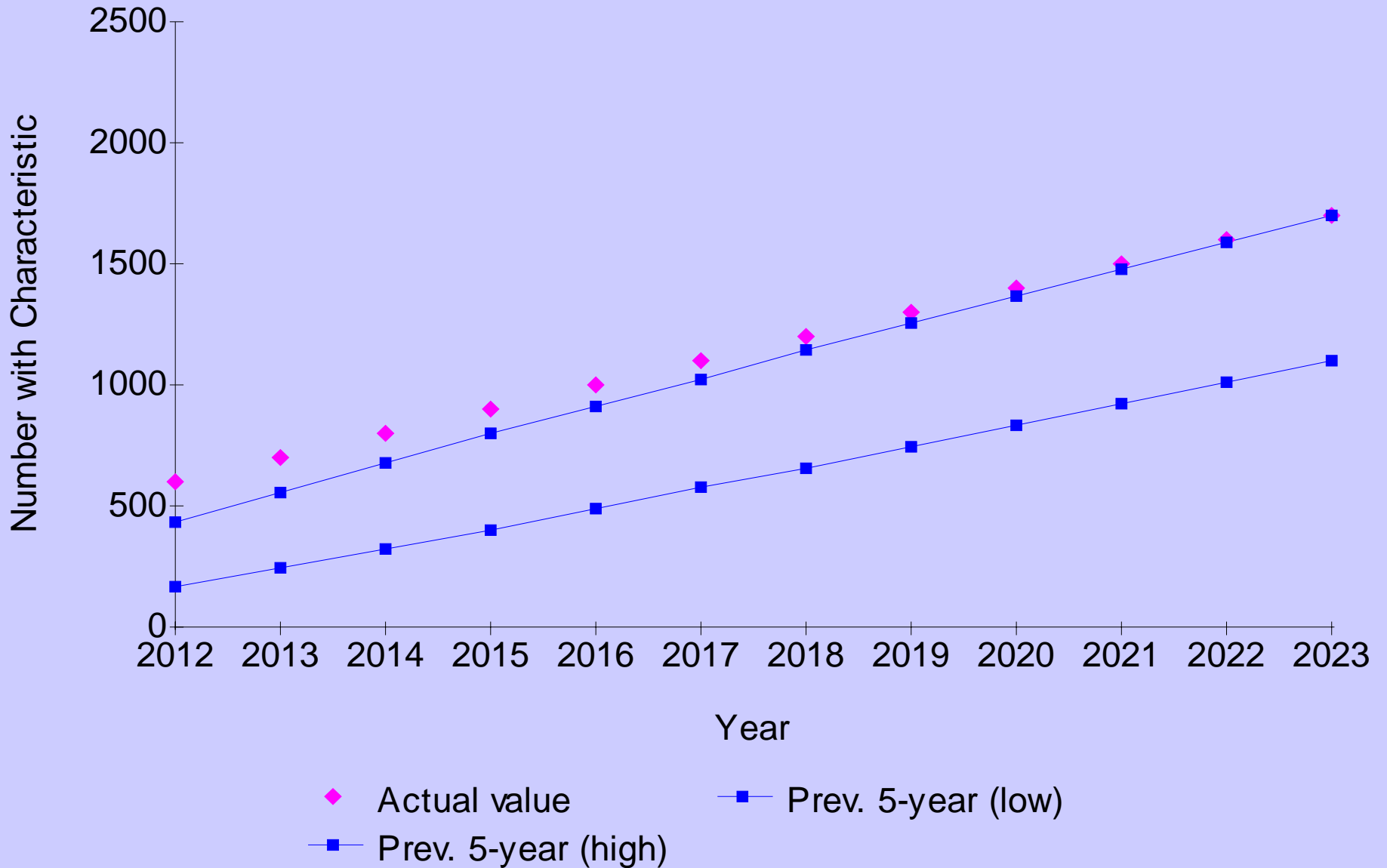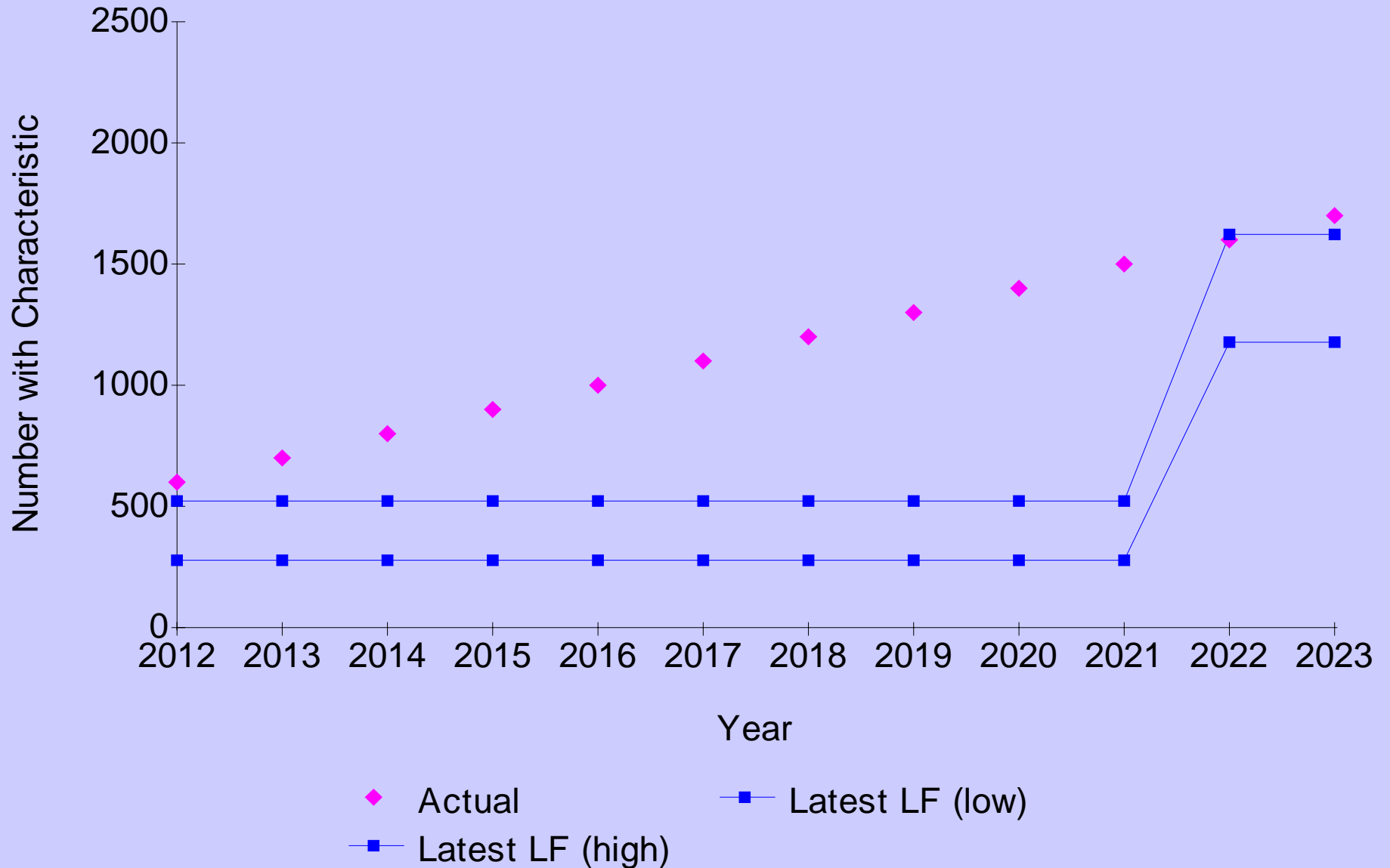
280-520   **240- 560**

ACS 5-year Average (Figure 1)
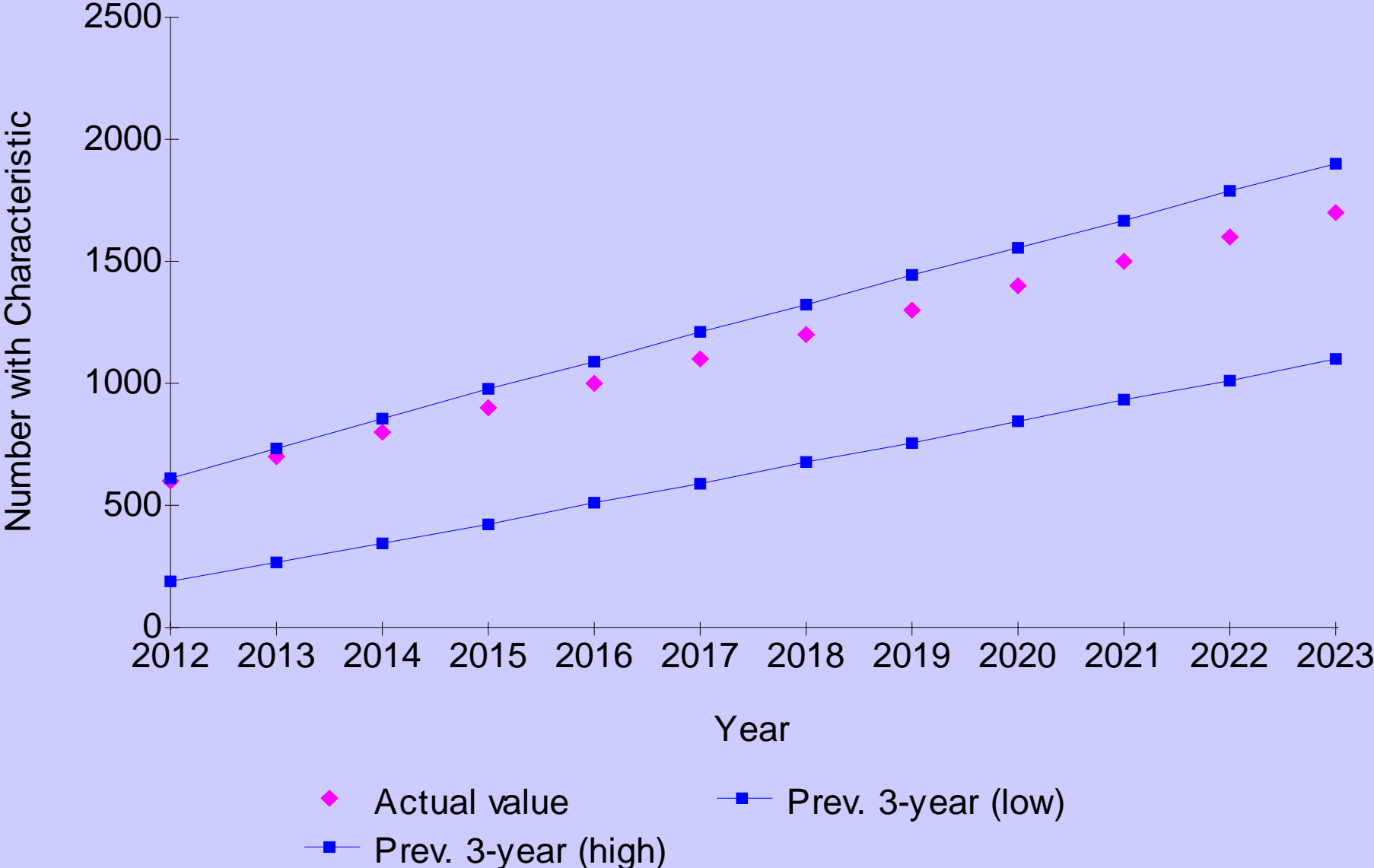
Population with Strong Trend

Legend:
- Actual value
- Prev. 5-year (low)
- Prev. 5-year (high)

X-axis: Year (2012–2023)
Y-axis: Number with Characteristic (0–2500)

Decennial Long Form (Figure 2)

Population with Strong Trend

ACS 3-year average (Figure 3)
Population with strong trend

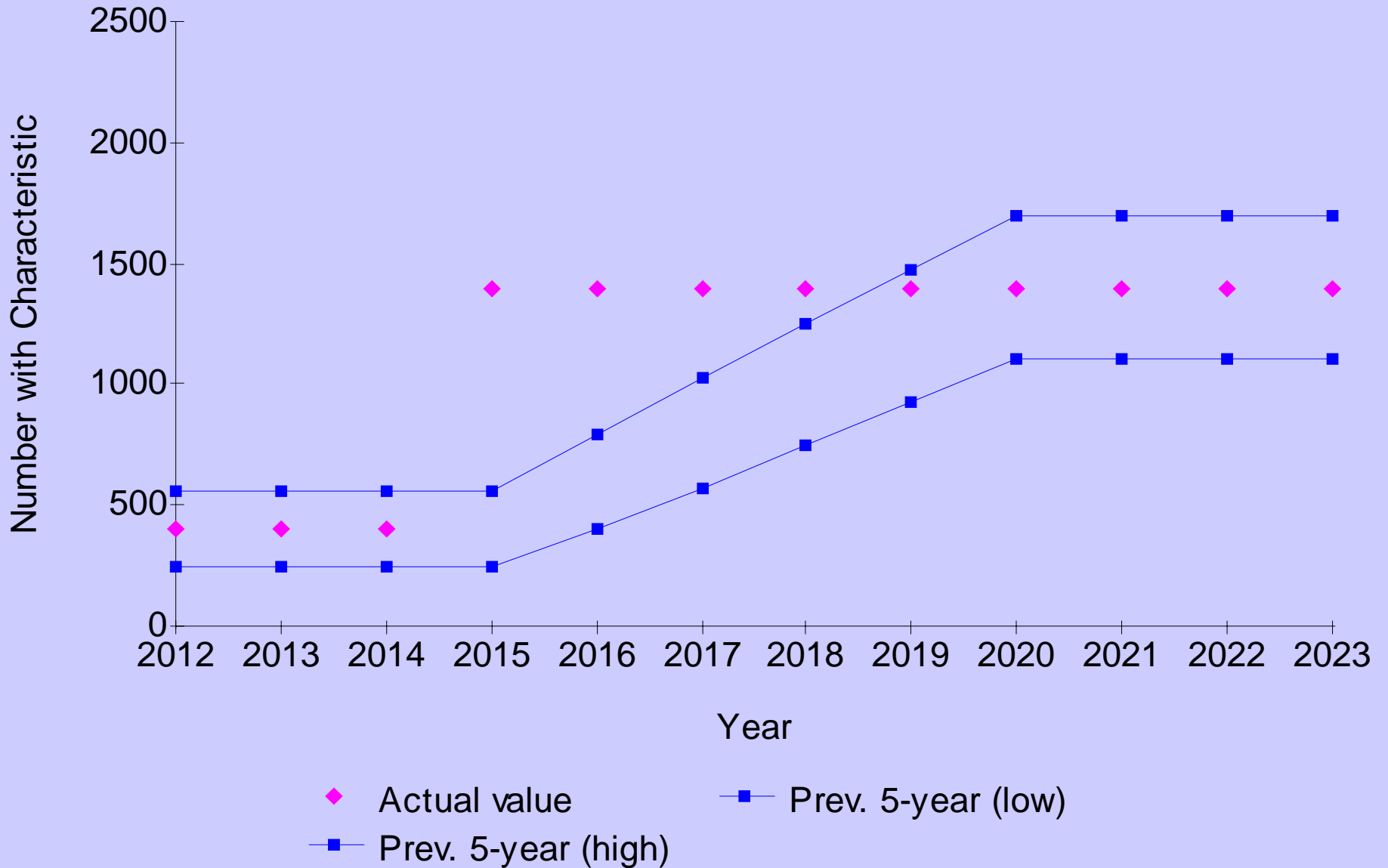**Number with Characteristic** (y-axis): 0, 500, 1000, 1500, 2000, 2500

Year (x-axis): 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023

Legend:
- ◆ Actual value
- ■ Prev. 3-year (low)
- ■ Prev. 3-year (high)

ACS 1-year Average (Figure 4)

Population with strong trend

Y-axis: Number with Characteristic (0, 500, 1000, 1500, 2000, 2500)

X-axis: Year (2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023)

Legend:
- Actual value
- Prev. year (low)
- Prev. year (high)
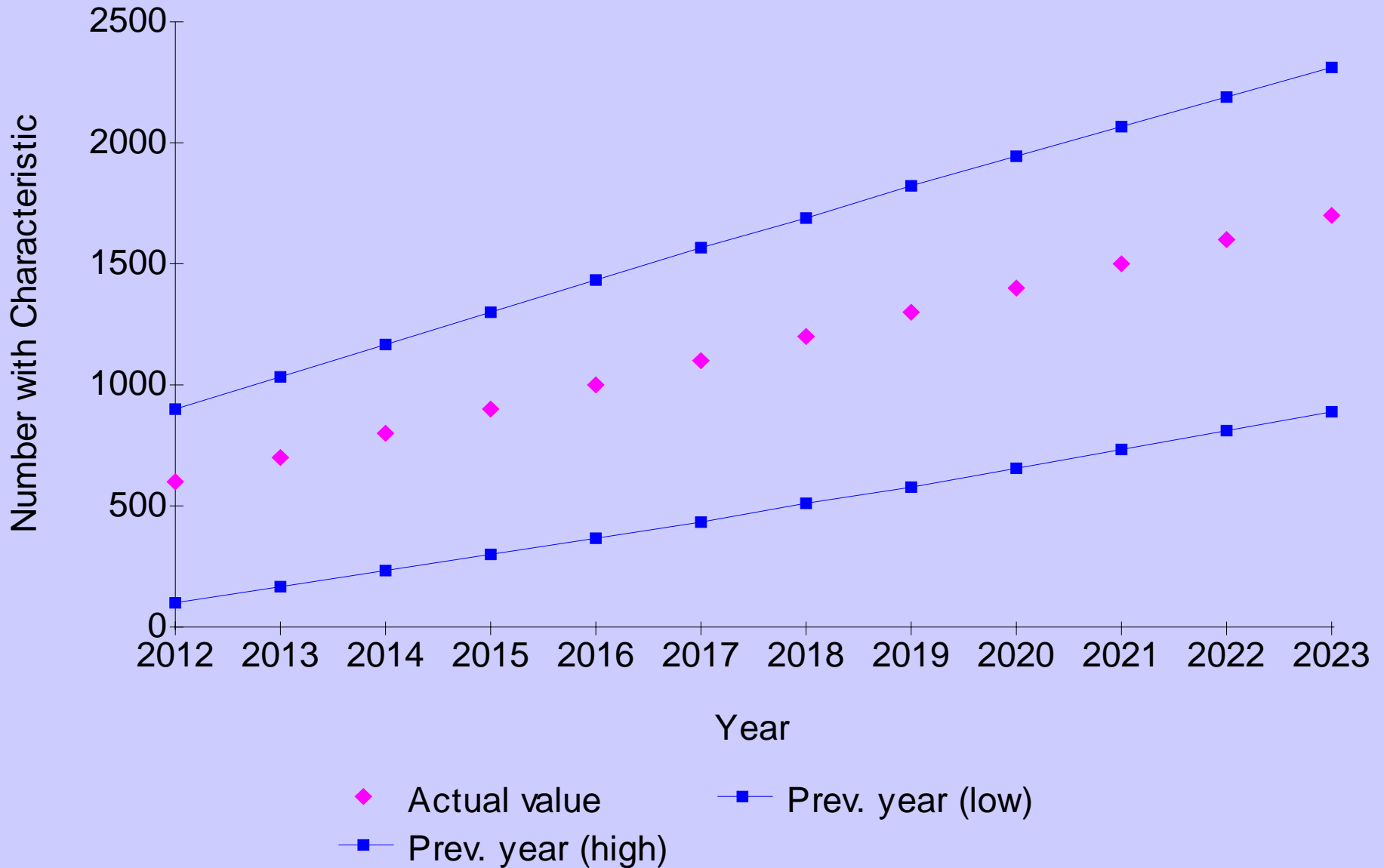
ACS 5-year Average (Figure 5)
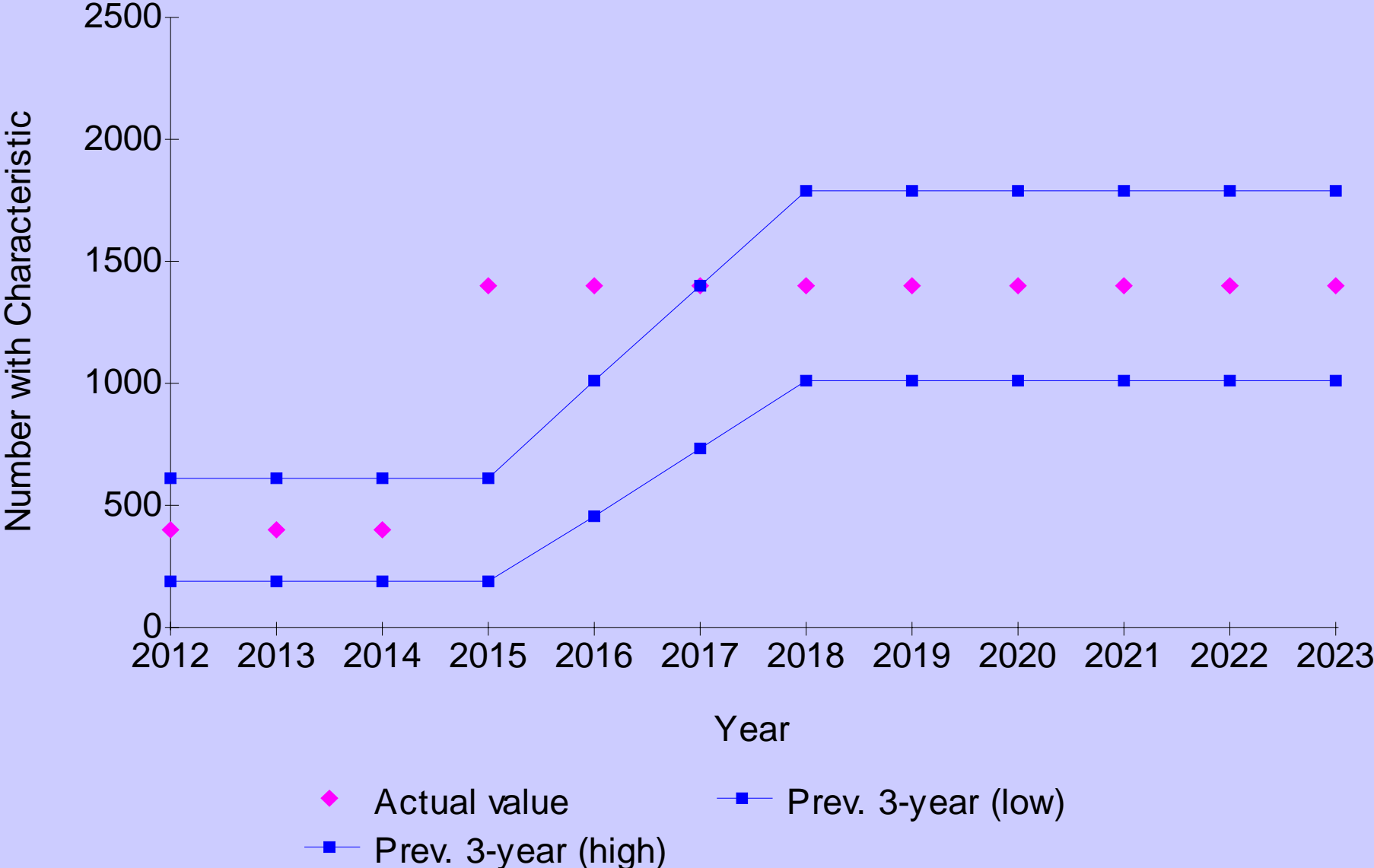
Population with Sudden Jump

Decennial Long Form (Figure 6)
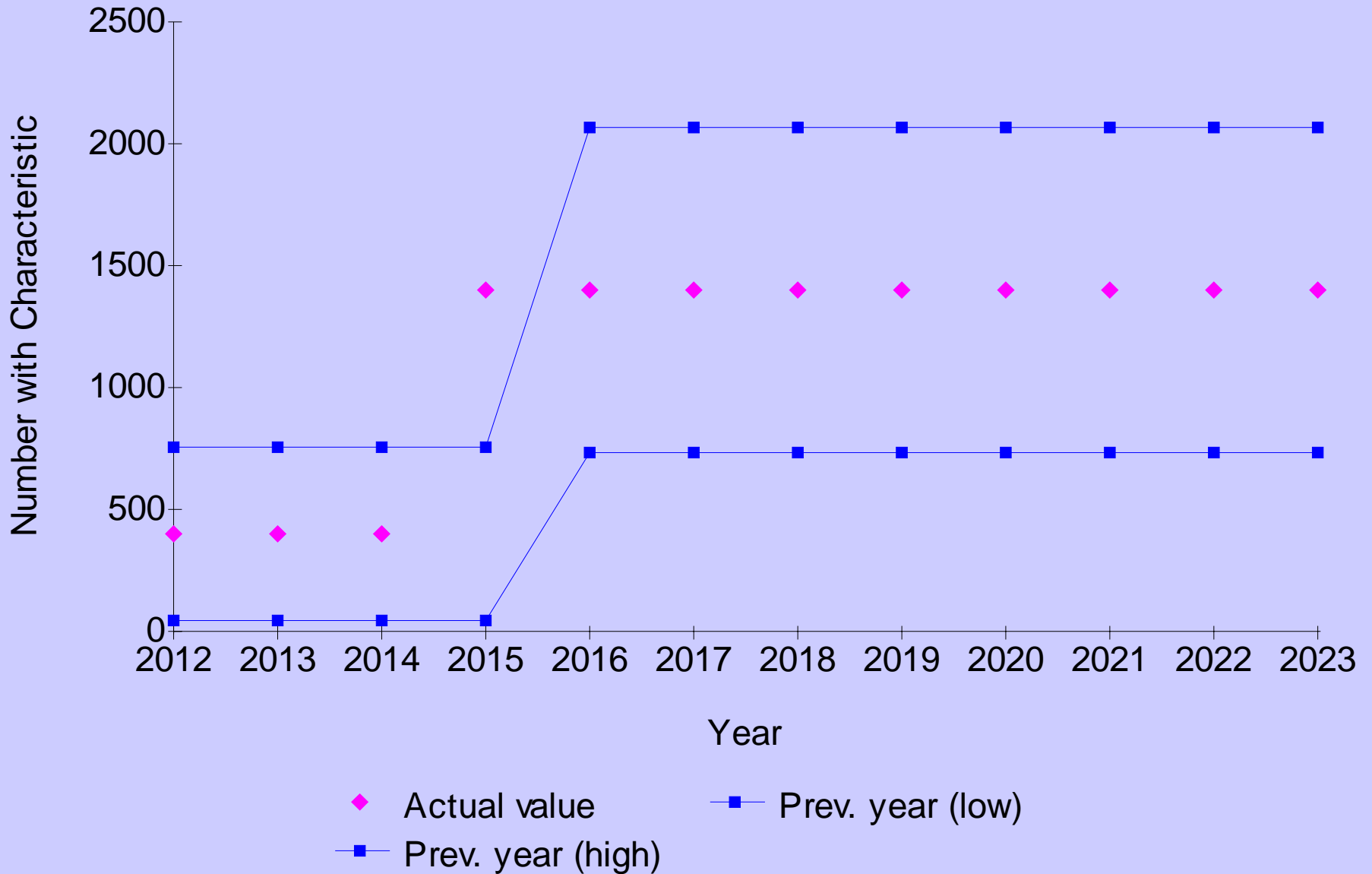
Population with Sudden Jump

ACS 3-year average (Figure 7)

Population with sudden jump

ACS 1-year Average (Figure 8)

Population with sudden jump

Issues About Multiple Year Data

- "Decennial snapshot" versus moving average
- Basic argument
  - no issue, if no change over time
  - decennial snapshot is weakest when there is change over time
- Single-year data needed to supplement 5 year averages
- Are there applications where a decennial snapshot is better?

U S C E N S U S B U R E A U

A STEADY TREND

Year(y)	1	2	3	4	5	6	7	8	9	10	11	12
Actual Size	400	420	440	460	480	500	520	540	560	580	600	620
5 year Average	---	---	---	---	---	440	460	480	500	520	540	560
Previous Census	---	---	---	---	---	---	480	480	480	480	480	480

Question #3

- What is the impact of the 1-in-3 sub-sampling of non-respondents in low mail response areas? Does it affect reliability?

- ACS sampling error will be larger than that of the long form

- Overall ACS quality will be comparable to that of the long form

Question #4

- How can a small monthly sample be representative?

- Estimates based on data collected over 60 months are reasonably stable

- The laws of probability provide the basis to calculate the margin of error due to the sampling mechanism

ACS Operational Improvements

- Use of higher sampling rates in small governmental units

- Implement an over-sampling plan in areas with low mail response

- Language program