American Community Survey Research Note

Guidance for Comparing the 2024 ACS 1-Year Estimates

September 11, 2025

There are multiple factors that contribute to the year-to-year changes data users may observe in American Community Survey (ACS) estimates. The Census Bureau is committed to providing high-quality data and rigorously reviews estimates before releasing them to the public. The Census Bureau observed and investigated unexpected differences in the 2024 ACS 1-year estimates compared with prior years and, after a thorough review of all relevant activities, concluded there were no data collection or processing errors. This research note outlines the key factors data users should keep in mind when comparing the 2024 ACS 1-year data with prior ACS 1-year estimates.

HOW THE ACS USES HOUSING AND POPULATION ESTIMATES

The ACS is a probability sample of housing units and group quarters designed to produce national, state and local estimates of the distribution of characteristics of housing and the population. The demographic characteristics of the ACS sample can differ from known population levels due to sampling variability and differential coverage.[1] To account for differences in demographic characteristics due to differential coverage, the ACS uses a weighting methodology that ensures ACS estimates are consistent with the Census Bureau's official housing unit and population estimates. Housing units are controlled to housing unit totals, while the population is controlled by age, sex, race, and Hispanic origin.[2] These specific estimates are called housing unit and population controls. Data users may be aware of these from the notes on some tables in data.census.gov.[3]

[1] One of the sources of undercoverage is non-response or non-participation. If a specific demographic group is less likely to respond, then the weighting methodology recognizes and accounts for that so that the final estimates are representative of the population.

[2] Chapter 11 "Weighting and Estimation" of the ACS Design and Methodology Report provides additional details on weighting and population estimates in the ACS at <https://www2.census.gov/programs-surveys/acs/methodology/design_and_methodology/2024/acs_design_methodology_report_2024.pdf>.

[3] When an ACS estimate has this forced consistency, the Census Bureau does not produce an estimate of variance. In data.census.gov, these "controlled" statistics are noted as follows: An entry of "******" in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate. For those characteristics that are controlled, the change between any two years is the result of updating the population estimates.

The 2024 1-year ACS was controlled to the Vintage 2024 housing and population estimates. The Vintage 2024 population estimates included a notable change to the methodology used to estimate net international migration (NIM). This change was implemented to more accurately account for humanitarian migrants (asylum seekers, parolees, refugees) who entered the United States from 2022 to 2024. The NIM change led to a large increase in the population from Vintage 2023 to Vintage 2024, which may cause differences between the 2023 and 2024 ACS 1-year estimates.

NIM Method Change

The NIM estimates are developed using data from the ACS, the Puerto Rico Community Survey, other federal agencies, and population registers and censuses from other countries. NIM is estimated in five components: non-U.S.-born immigration, non-U.S.-born emigration, migration between the United States and Puerto Rico, U.S.-born net migration, and movement of the armed forces population to and from overseas. For Vintage 2024, the only change to the NIM method was for the non-U.S.-born immigration component, which is the largest component of NIM.

The national total for the non-U.S.-born immigration component comes from the ACS 1-year data. Specifically, we look at the foreign-born population whose residence one year ago was abroad, and we refer to this as the ROYA population. Additionally, we use data from other federal agencies to adjust the ROYA population if it is too high or too low. We do this because the ACS 1-year data are lagged by a year (e.g., the 2023 ACS 1-year file was used for the Vintage 2024 estimates) and some populations are underrepresented in the ACS.

For Vintage 2024, we made adjustments to the 2022, 2023, and 2024 periods to account for humanitarian migrants who entered the United States during that time. Our internal research found that these migrants were not fully reflected in the ACS ROYA population. We used data from the U.S. Department of Homeland Security and U.S. Department of State to make the adjustment.

We also use the ACS data to develop the geographic distribution and demographic characteristics for the NIM estimates. While there are other federal agencies that also produce estimates and projections of international migration flows, the Census Bureau's Population Estimates Program (PEP) is the only agency that produces these estimates at the county level by age, sex, race, and Hispanic origin. We use the large sample provided by the ACS to do this; however, even with such a large sample size, we still cannot distribute the characteristics directly. Instead, we use a sample from the ACS that approximates the population that we are estimating. For the non-U.S.-born immigration component, we use the geographic distribution and demographic characteristics of the foreign-born population who entered the United States in the past five years.

As mentioned above, we made an adjustment to the ROYA estimate in the Vintage 2024 population estimates to account for humanitarian migrants. The adjustment resulted in a higher number of immigrants at the national level, which was then distributed down to states and counties using our regular ACS-based method. While the change impacted the immigration estimates for states and counties, we did not change the usual method to specifically put humanitarian migrants in the states and counties where they were settling. Basically, all counties that were *already* receiving immigration increased, while counties that were not receiving any immigration did not see an impact. For the forthcoming Vintage 2025 population estimates, we are developing a method to assign humanitarian migrants to the states and counties where they were settling.

Increase From 2023 to 2024

The method improvement for the NIM component led to a large increase in the total population. Table 1 shows the ACS national totals from the 2023 ACS and 2024 ACS 1-year files. Again, these totals were both controlled to the PEP estimates. Notice that the difference between the 2024 and 2023 ACS 1-year totals was 5.196 million, which is a large increase from one year to the next. However, this difference includes both cumulative change from 2020 to 2023 across the vintage estimates (i.e., Vintage 2023 vs. Vintage 2024) and annual change from 2023 to 2024 within Vintage 2024.

Each year, PEP releases a new time series of estimates from the current year back to the most recent census. The most recent population estimates showed large increases in the number of immigrants in the 2022 and 2023 periods, and not just in 2024. In Vintage 2024, we estimated that a net of 7.75 million people migrated into the United States between April 1, 2020, and December 1, 2024. This is 3.61 million net migrants (87.0 percent) higher than the same period in Vintage 2023, which included a projection for December 2024.

Table 1.
Total Population Reported in the 2023 and 2024 American Community Survey 1-Year Estimates for the United States

United States	2023	2024	Annual difference (2024 – 2023)
Total population. . . .	334,914,896	340,110,990	5,196,094

Note: There is no margin of error because the estimates are controlled to an independent population estimate, and the standard errors for the estimates are set to zero.
Source: U.S. Census Bureau, 2023 and 2024 American Community Survey 1-year estimates.

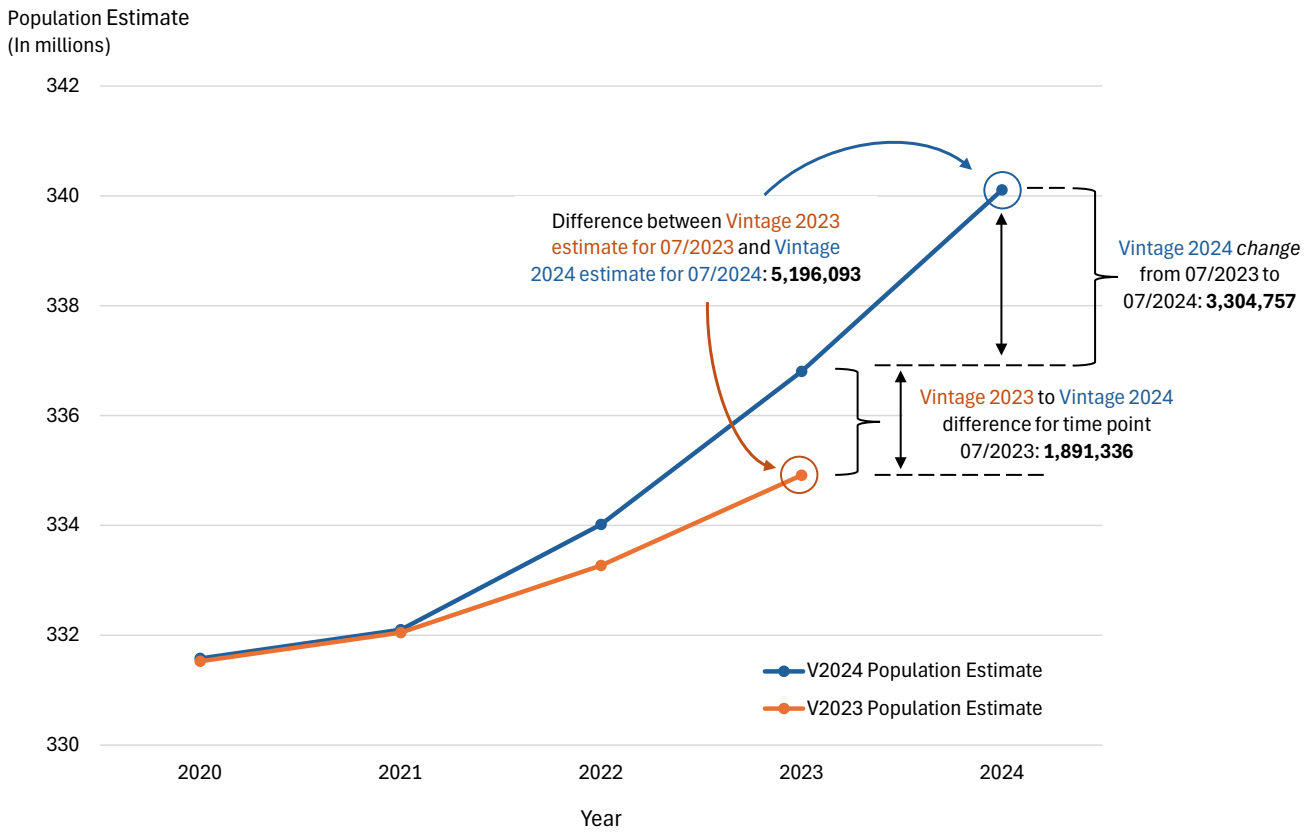
Another way to look at this is to focus on how the total population changed during the time series from 2020 to 2023 and the annual change from 2023 to 2024 (Figure 1). The difference between the 2023 value in the Vintage 2023 and Vintage 2024 population estimates was 1.89 million. The annual change from 2023 to 2024 in the Vintage 2024 population estimates was 3.30 million. Added together, the cumulative change and the annual change equal 5.196 million, which is the difference between the totals for the 2023 and 2024 ACS 1-year files discussed in Table 1.

Housing Unit vs Population Controls

The ACS uses both housing unit and population controls from the PEP estimates to ensure that the ACS data are representative of the United States. The methodology used to produce the housing units is independent of the methodology used to produce the population estimates. The housing unit estimates are developed beginning with the number of housing units enumerated in the 2020 Census as the base and accounting for both new residential construction/new mobile homes as well as housing loss. The population estimates for counties and higher levels of geography are developed using a cohort-component method, which measures change in the population since the date of the most recent census using current data on births, deaths, and migration.

The housing unit estimates increased from 145.3 million in Vintage 2023 to 146.8 million in Vintage 2024, resulting in a total difference of 1.43 million.

Figure 1.
Vintage 2023 and Vintage 2024 Estimates Comparison



Source: U.S. Census Bureau, Vintage 2024 and Vintage 2023 Population Estimates.

As explained above, this difference includes both cumulative change from 2020 to 2023 and annual change from 2023 to 2024. This was similar to the difference between the Vintage 2022 and Vintage 2023 housing units estimates, which was 1.56 million.

The difference in the magnitude of change between Vintage 2023 and Vintage 2024 housing unit and population estimates does not imply that one is more accurate than the other. Housing growth often lags population change, meaning that new housing is added after (and not necessarily before or during) periods of population growth. However, the large increase in the population controls from 2023 to 2024, combined with the smaller increase in the housing unit controls for the same period, could impact the ACS estimates.

For example, the ACS estimates of persons-per-household for a given community could be higher than prior years because the housing unit control increased slightly while the population control had a large increase. This interaction between the housing unit and population controls could also impact the household equalization process described below.

ACS SAMPLING AND WEIGHTING

The ACS has a fixed sample size of 3.54 million housing unit addresses each year, allocated across all blocks in the country. Blocks are assigned to one of 16 sampling strata based upon the number of housing units in their local geographic units. The sample is selected from a frame based upon the Master Address File, which is continuously updated each year. As the frame grows each year, the sampling rates must decrease to maintain our target sample size.

Additionally, we sample all non-respondents to our mail and internet data collection attempts for in-person follow-up. Due to resource constraints, we have had to cap the monthly workload for in-person follow-up since 2020. This results in smaller sample sizes and sampling rates than expected during the

in-person follow-up. These caps can also change year to year and month to month, increasing the variability in our final estimates as well.

To create the estimates, we weight all sample cases to represent the total population. The first step in the weighting is to account for the initial sample selection as well as the second sample for in-person follow-up. As both sampling rates decrease, the initial weights for the entire sample increase each year, leading to greater variability in our estimates each year, even in areas with relatively stable populations.

The ACS also performs a non-interview adjustment to account for non-response during data collection. This step reweights responders to represent non-responders within weighting cells. If the non-response patterns shift, the composition of weighting cells and the magnitude of their adjustments change. This means that year-specific response patterns and follow-up outcomes alter the non-interview adjustment calculation, producing legitimate year-to-year movement beyond pure sampling error.

In the final stage of the weighting, ACS controls housing unit and person weights so that weighted totals align with PEP controls by age, sex, race, Hispanic origin, and housing unit totals at the weighting-area level. As described above, the PEP controls are updated annually; when controls move, ACS estimates are pulled toward the new controls, which can create discontinuities unrelated to survey responses.

As part of creating the person weights, we aim to ensure consistency between the housing unit and population totals in our weighting. To this end, we use the same weight for the household and the primary householder. This means that the sum of the householder weights is anchored to the housing unit control totals. We also want to ensure that the estimates for householders and householder partners are consistent, so those totals are also anchored to the housing unit control totals. Group quarters population totals are controlled at the state level, so there can be variability within the sub-state populations.

The remaining response universe, non-householders, is where the balance of the total population controls are applied. Due to the updated methodology to improve the NIM calculation, the population controls changed more year-to-year than the housing unit controls, and that change was not evenly distributed amongst all demographic groups (age, sex, race, ethnicity). Since the householder weights are anchored to the housing unit controls, the change in the total population is seen most in the weights for the non-householder population. This step also interacts with the application of population controls, as non-householders may belong to certain demographic groups more than householders.

As part applying population controls, we create cells, or groups of demographic characteristics, to apply the controls to. We attempt to preserve race/ethnicity groups first, and then age/sex groups within race/ethnicity groups as well as we can. The collapsing is based upon the responses each year, so the collapsing pattern changes each year. We have seen a slight reduction in our race collapsing over the past several years. When the collapsing within race/ethnicity is reduced within a given year, those categories are better controlled in the final estimates. To maintain convergence and cell stability under fixed total control dimensions, the age/sex cells may require more collapsing (broader age bands or combined sex within age) in some weighting areas.

NONRESPONSE BIAS

The ACS has had lower response rates in the 2020s compared to the 2010s, which can increase the risk of nonresponse bias. To evaluate nonresponse bias for the 2024 ACS 1-year, Table 2 provides a look at administrative records for households in the sample (when available). It compares how certain characteristics of the people who responded might be different from those who did not. The list of administrative data sources and the approach to linking them together is largely similar to what is described in Rothbaum et al. (2021) for the 2020 ACS 1-Year Experimental Data Release. Note that the analyses in Table 2 (1) display means of administrative data variables, which may have conceptual differences from the topics measured in the ACS and (2) describe the magnitude of nonresponse bias *before* weighting adjustments. Current weighting procedures may reduce the impact of the differences between respondents and nonrespondents described in the subsequent tables.

Table 2 compares at the national level the characteristics of 2024 ACS respondents compared to a benchmark of all 2024 ACS sample members, including both respondents and nonrespondents. The

Table 2.
National-Level Comparisons in Nonresponse Bias for the 2024 and 2023 American Community Survey

Variable from administrative data	Mean sample members 2024 ACS	Mean respondents 2024 ACS	Bias 2024 ACS	2024 bias S.E.	Bias 2023 ACS	2023 bias S.E.	Change 2024 vs 2023	Change in bias significant?
Income over $150,000 . . .	22.46	24.59	2.13	0.02	1.80	0.02	0.33	Yes
Income under $50,000 . .	17.62	16.83	−0.79	0.02	−0.69	0.02	−0.10	Yes
Any children	26.76	26.23	−0.53	0.02	−0.47	0.02	−0.06	Yes
Any household member over 60	41.86	45.36	3.50	0.03	3.10	0.02	0.40	Yes
Any non-citizen	11.72	11.43	−0.29	0.02	−0.20	0.02	−0.09	Yes
Receipt of SSA OASDI disability benefits	5.10	5.17	0.07	0.01	0.09	0.01	−0.02	No
Any married household members	38.12	41.95	3.83	0.02	3.44	0.02	0.39	Yes
Single-unit housing structure	71.55	74.22	2.67	0.02	2.56	0.02	0.11	Yes

Note: S.E. stands for standard error, which is a measurement of the statistical precision of an estimate.
Source: 2023 and 2024 ACS 1-year data merged with administrative data. Variable definition and construction are similar to what is described in Rothbaum et al. (2021). Analysis sample restricted to occupied housing units. The mean sample member column includes respondent and nonrespondent households. The Census Bureau has ensured appropriate access and use of confidential data and has reviewed these results for disclosure avoidance protection (Project 7531477: CBDRB-FY25-CES005-015).

difference between the benchmark and respondent means is also presented for 2023 to provide context. Overall, ACS respondents continue to have higher income and higher marriage rates compared to nonrespondents, which is similar to the trend documented in Rothbaum et al. (2021) for the 2019 and 2020 ACS. For example, 41.95% of respondent households in 2024 have a person who is married, as measured by filing status on tax returns. However, this rate decreases to 38.12% when calculated on the full sample including nonrespondents. This estimated nonresponse bias means that ACS respondent households are 3.83 percentage points more likely to have a married household member compared to the general population.

In addition to showing nonresponse bias for 2024, Table 2 displays the changes in nonresponse bias for each variable between 2023 and 2024. There was no significant change in nonresponse bias between 2024 and 2023 for receipt of disability benefits. All the other variables listed in the table had a significant change in nonresponse bias. The magnitude of the change varies across variables. Respondent households went from being 0.47 percentage points less likely to have children in the 2023 ACS to 0.53 percentage points less likely to have children in the 2024 ACS, a change of 0.06 percentage points. By contrast, respondent households went from being 3.44 percentage points more likely to have a married person in the 2023 ACS to 3.83 percentage points more likely to have a married person in the 2024 ACS, a change of 0.39 percentage points.

Next, Table 3 shows how nonresponse bias in the percent of households with any married household members varies at the state level for 2024 and 2023. For expositional purposes, we present state-level nonresponse bias analyses for only one variable, and we pick marital status, given it had one of the larger year-to-year changes at the national level. This table shows how there can be variation in nonresponse bias by state from year to year. For example, North Dakota had a nonresponse bias of 6.84 percentage points in 2024, compared to 3.17 percentage points for South Dakota. There is also state-level variation in the change of bias between 2023 and 2024. In Montana, for example, the bias increased by 1.47 percentage points between 2023 and 2024, while in South Dakota, there is no statistically significant difference between the bias estimates of 3.35 percentage points in 2023 and 3.17 percentage points in 2024.

See also Eggleston and Sawyer (2025) for additional information of the geographic variability in nonresponse bias for the ACS.

Table 3.

State-Level Comparisons in Nonresponse Bias for the 2024 and 2023 American Community Survey, Administrative Data Variable: Presence of Any Married Household Member

Sate	Mean sample members 2024 ACS (respondents and nonrespondents)	Mean respondents 2024 ACS	Bias 2024 ACS	2024 bias S.E.	Bias 2023 ACS	2023 bias S.E.	Change 2024 vs 2023	Change in bias significant?
Alabama	34.43	38.37	3.94	0.15	3.65	0.16	0.29	No
Alaska	39.15	43.81	4.66	0.64	3.34	0.71	1.32	No
Arizona	36.25	41.15	4.90	0.19	3.94	0.16	0.96	Yes
Arkansas	36.01	39.69	3.68	0.23	2.81	0.18	0.87	Yes
California	40.70	43.12	2.42	0.06	2.31	0.06	0.11	No
Colorado	39.76	44.44	4.68	0.17	3.87	0.16	0.81	Yes
Connecticut	38.64	42.37	3.73	0.22	3.53	0.19	0.20	No
Delaware	38.74	43.32	4.58	0.41	3.22	0.30	1.36	Yes
District of Columbia	16.25	20.28	4.03	0.42	3.71	0.41	0.32	No
Florida	36.49	39.83	3.34	0.11	2.95	0.08	0.39	Yes
Georgia	34.95	40.08	5.13	0.14	4.07	0.11	1.06	Yes
Hawaii	37.25	39.23	1.98	0.31	1.62	0.20	0.36	No
Idaho	47.22	49.55	2.33	0.26	2.05	0.24	0.28	No
Illinois	37.91	42.14	4.23	0.11	4.33	0.11	−0.09	No
Indiana	40.04	43.49	3.45	0.14	3.31	0.14	0.14	No
Iowa	43.30	45.65	2.35	0.17	2.91	0.15	−0.56	Yes
Kansas	42.01	45.98	3.97	0.26	3.15	0.19	0.82	Yes
Kentucky	37.04	40.58	3.54	0.18	3.05	0.15	0.49	Yes
Louisiana	30.99	34.68	3.69	0.23	4.25	0.20	−0.56	Yes
Maine	39.46	42.95	3.49	0.34	2.97	0.29	0.52	No
Maryland	37.68	43.04	5.36	0.18	4.74	0.18	0.62	Yes
Massachusetts	38.51	41.52	3.01	0.13	2.43	0.12	0.59	Yes
Michigan	39.65	43.11	3.46	0.11	3.39	0.10	0.07	No
Minnesota	43.18	46.38	3.20	0.12	3.26	0.13	−0.06	No
Mississippi	30.76	34.75	3.99	0.26	4.36	0.23	−0.37	No
Missouri	38.51	42.58	4.07	0.16	3.95	0.14	0.12	No
Montana	37.61	41.38	3.77	0.32	2.30	0.37	1.47	Yes
Nebraska	41.87	46.58	4.71	0.25	4.04	0.22	0.68	Yes
Nevada	34.60	37.05	2.45	0.22	2.53	0.19	−0.08	No
New Hampshire	44.01	46.60	2.59	0.32	2.08	0.35	0.52	No
New Jersey	40.47	45.72	5.25	0.17	4.98	0.15	0.27	No
New Mexico	31.69	35.56	3.87	0.29	3.08	0.31	0.79	Yes
New York	31.80	35.46	3.66	0.10	3.70	0.10	−0.04	No
North Carolina	37.72	41.55	3.83	0.13	3.13	0.09	0.70	Yes
North Dakota	37.40	44.24	6.84	0.57	5.98	0.44	0.86	No
Ohio	36.40	40.15	3.75	0.10	3.04	0.10	0.71	Yes
Oklahoma	35.23	40.55	5.32	0.34	4.60	0.35	0.72	No
Oregon	39.34	42.00	2.66	0.17	2.91	0.15	−0.25	No
Pennsylvania	39.52	44.35	4.83	0.12	3.93	0.10	0.90	Yes
Rhode Island	32.71	37.31	4.60	0.42	4.63	0.43	−0.03	No
South Carolina	36.93	41.34	4.41	0.17	3.13	0.14	1.28	Yes
South Dakota	41.79	44.96	3.17	0.42	3.35	0.29	−0.18	No
Tennessee	38.21	41.58	3.37	0.15	3.23	0.13	0.14	No
Texas	37.93	42.58	4.65	0.09	4.06	0.08	0.59	Yes
Utah	49.30	53.14	3.84	0.28	2.51	0.21	1.33	Yes
Vermont	36.32	39.88	3.56	0.43	3.20	0.45	0.36	No
Virginia	41.30	44.53	3.23	0.13	2.65	0.12	0.58	Yes
Washington	42.15	44.68	2.53	0.15	2.47	0.10	0.06	No
West Virginia	36.69	39.44	2.75	0.28	2.35	0.25	0.40	No
Wisconsin	41.48	44.94	3.46	0.14	2.69	0.11	0.77	Yes
Wyoming	38.06	42.95	4.89	0.65	3.26	0.56	1.63	Yes

Note: S.E. stands for standard error, which is a measurement of the statistical precision of an estimate.

Source: 2023 and 2024 ACS 1-year data merged with administrative data. Variable definition and construction are similar to what is described in Rothbaum et al. (2021). Any address not matched to administrative data is coded as not married in this table. Analysis sample restricted to occupied housing units. The Census Bureau has ensured appropriate access and use of confidential data and has reviewed these results for disclosure avoidance protection (Project 7531477: CBDRB-FY25-CES005-015).

COMPUTER-ASSISTED PERSONAL INTERVIEWING (CAPI) OPTIMIZATION

In 2023, the ACS began using administrative data to optimize data collection costs and data quality in the CAPI operation by informing contact strategies—when to decrease the number of visits or when to stop interviewing.[4] The ACS does this in two ways. First, a vacancy prediction model is run to identify housing units with a high probability of being vacant. Interviewers are alerted that, for these cases, the initial contact attempt should be made in person (rather than by phone). A maximum of two attempts is allowed to determine the unit's status and collect the required information (Keller, 2024). This allows interviewers to identify likely vacant housing units more quickly and free up their time to complete interviews for housing units that are more likely to be occupied. Second, for housing units that the vacancy prediction model does not identify, the ACS uses administrative data, historic response data, and survey paradata to develop data- and model-driven business rules to determine cases to stop interviewing before the end of the month. After ten full weekdays and two full weekends for each CAPI month, the models identify the best cases to remove from the workload to minimize adverse effects on data quality. Cases identified are still eligible to respond online or by mail. If a response is not received, they are treated as noninterviews. In 2024, less than 1% of the monthly ACS sample was removed from the CAPI workload each month through either of the two approaches.

SUMMARY

Multiple factors can impact changes in ACS estimates over time, including emerging trends in the population, methodological changes to the survey, and the resulting interplay of those things through the established survey methodology. The Census Bureau observed and investigated unexpected differences in the 2024 ACS 1-year estimates compared with prior years and concluded there were no data collection or processing errors. As outlined in this research note, data users need to keep multiple factors in mind when comparing the 2024 ACS 1-year estimates with prior ACS estimates.

[4] After the self-response phase of data collection a sample of nonresponding addresses is selected for follow-up with a Census Bureau representative, either by phone or in-person, This phase is known as Computer Assisted Personal Interviewing (CAPI).

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