Department of Commerce
United States Census Bureau
OMB Information Collection Request
2020 Census Post-Enumeration Survey Independent Listing Operation
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B. COLLECTIONS OF INFORMATION EMPLOYING STATISTICAL METHODS

1. Universe and Respondent Selection

The 2020 Post-Enumeration Survey (PES) sample design has been developed to support the various objectives of the program, which includes estimating correct enumerations, erroneous enumerations, and omissions in addition to net coverage error for the 2020 Census. The PES is designed to measure the coverage of housing units (HUs) and people, excluding group quarters and people residing in group quarters. The PES will be conducted in the U.S. and in Puerto Rico in selected PES sampled areas. Remote areas of Alaska are out-of-scope for PES because the seasonal nature of addresses and the population throughout the year make it infeasible to accurately conduct the matching and followup operations necessary for dual-system estimation. For this reason, the Census Bureau's past post-enumeration surveys have never included remote Alaska.

The PES sample consists of two parts. The Population Sample, P sample, and the Enumeration Sample, E sample, have traditionally defined the samples for dual system estimation. Both the P sample and the E sample measure the same HU and household population. However, the P sample operations are conducted independent of the census. The E sample consists of census enumerations in the same sample areas as the P sample. For net coverage error estimation, after matching with the census lists and reconciliation, the P sample provides information about the population missed in the census whereas the E sample provides information about erroneous census inclusions. The correct enumeration rate and match rate provide an estimate of the true population size using dual system estimation. From this number, an estimate of net error is derived.

The PES is a multiphase operation designed to measure the net coverage and components of coverage for the household population and HUs in the 2020 Census. The PES sample design comprises a number of distinct processes from forming Basic Collection Units (BCUs), creating the sampling frame, selecting sample BCUs, to eventually selecting addresses for the P sample and E sample. After the PES BCUs are selected, an address list is created independent of the census for each PES sample BCU. The approximate PES listing workload is 10,100 BCUs for the United States and 400 for Puerto Rico. Overall, approximately 565,000 HUs are listed (541,000 in the nation and 24,000 in Puerto Rico). Finally, after subsampling the PES HUs listed during

Independent Listing, the final expected P-sample size is approximately 171,500 HUs for the nation and 8,000 for Puerto Rico. The national sample is distributed among the 50 states and the District of Columbia roughly proportional to population size, although there are slight increases in the sample for small states and for American Indian Reservations.

Table 1 summarizes, for the United States and Puerto Rico, the expected 2020 PES listing workloads and P-sample size. The E-sample size is expected to be about the same as that for the P sample.

Table 1: 2020 PES Universe and Sample Housing Unit Summary

Geography	Expected Listing Sample Size	Expected P-sample Size
U.S.	541,000	171,500
Puerto Rico	24,000	8,000
Total	565,000	179,500

The PES sample has three phases of sampling. In the first phase of the PES sampling, BCUs in each state are classified into mutually exclusive and relatively homogeneous groups known as sampling strata. These strata are based on the BCU size and whether the BCU is located on an American Indian Reservation. The four major strata are (1) BCUs with 0 to 2 HUs (small stratum), (2) BCUs with 3 to 57 HUs (medium stratum), (3) BCUs with 58 or more HUs (large stratum), and (4) BCUs on American Indian Reservations with three or more HUs (American Indian Reservation stratum). Using 2010 Census data, the medium and large strata are further split into renter and owner BCUs, resulting in up to six sampling strata being formed in each state and Puerto Rico. The definition of the large and medium groups in 2020 PES is different from the 2010 Census Coverage Measurement (CCM). For 2010 CCM, the medium group contained block clusters with 3 to 79 HUs and the large group contained block clusters with 80 or more HUs. Since the size of the BCUs is smaller than the block clusters on average, this change preserves the same proportion of frame HUs in the medium and large strata between the two designs (2010 and 2020). This yields a similar HU Independent Listing workload.

BCUs in the larger stratum are selected with higher probability of selection than BCUs in the medium stratum in this first phase because HUs in large BCUs are expected to be subsampled in the third phase. This allows more BCUs to be selected into sample. The non-owner stratum is selected at a higher rate (1.5 times higher) than the BCUs in the owner stratum. This is the same differential sampling factor used in the 2010 CCM. The differential sampling factor of 1.5 provides a balance between improving the reliability of estimates for the smaller non-owner domain and improving the precision of other domain estimates and the total for a fixed sample

size. Within each of the six sampling stratum for each state, the BCUs are sorted and a systematic sample is selected with equal probability.

The second phase of the 2020 PES selects a subsample of BCUs from the first-phase small sampling stratum using a similar method as in the 2010 CCM design. We use a double-sampling technique by selecting a slightly larger sample of small BCUs in the first phase then selecting a subsample of small BCUs for person interview using an updated measure of size. This is done to reduce a BCU's influence on the estimates when more HUs are found than expected. Additionally, small BCU subsampling reduces costs, as conducting interview and follow-up operations in small BCUs is more expensive per HU than in medium or large BCUs.
Using HU counts from both the Independent Listing and the updated census address list, the small BCUs selected in the first phase are restratified by these counts within each state. A systematic sample of BCUs is selected within each stratum with equal probability. All BCUs from the small sampling stratum with ten or more HUs based on the updated counts are retained in sample. All BCUs from the small sampling stratum that are on American Indian Country are also retained in sample. (American Indian Country includes American Indian Reservations and associated trust lands, as well as the American Indian statistical areas.)

The first and second phases of the 2020 PES select the BCU sample. In the third phase of PES sampling, we select a subsample of HUs within large BCUs. For a BCU with 57 or fewer HUs observed, all of the HUs are included in the sample. For a BCU with 58 or more HUs observed, a subsample of segments of contiguous HUs is selected to facilitate data collection in the field and to reduce the impact of intraclass correlation on the variance. This phase of sampling results in more similar overall selection probabilities for HUs because the large BCUs will have a higher probability of selection at the first phase.

The sampling frame for the P-sample HUs is the result of the PES initial HU matching and followup operations. The intent of these HU operations is to identify matches between the independent HU list and an early census HU list. In addition to sending the P sample to the Person Interview, a sample of census units that were missed during the Independent Listing operation will be sent to the Person Interview. While not part of the P sample, these census units are likely to be in the E sample. The P-sample people result from the person interviewing in the P-sample HUs.

The sampling frame for the E-sample HUs consists of the HUs in PES sample areas from the list of 2020 Census enumerations that is available after the P sample is selected. While these two samples are selected at different points in time, we attempt to geographically overlap them to the extent possible. The E-sample people are the census enumerations in the E-sample HUs with enough information collected.

2. Procedures for Collecting Information

The Independent Listing operation will be conducted using in-field person-to-person interviews with an automated instrument on a laptop. Field staff, referred to as "listers" will canvass every street, road, or other place where people might live in their assigned BCUs in the 50 states (excluding remote Alaska) and the District of Columbia to construct a list of HUs using an automated data collection instrument on a laptop. The instrument will be translated into Spanish for use in Puerto Rico and adapted for the types of addresses found there. Listers will attempt to contact a member of each HU they encounter in their assigned BCU to ensure all units at a given address are listed. If someone answers, the lister will provide the Confidentiality Notice, Form D-31 (PES-IL) or Form D-31 (PES-IL) PR (see Attachments) and ask about the address to collect the address information, as appropriate. If the listers do not find anyone at home after several attempts, as a last resort they will try to collect the information from a proxy or update the address list as best they can by observation. Listers will also identify the location of each HU by collecting map spots and collect information on the status of each HU, such as occupied, vacant, under construction, empty trailer park, etc. The response rate for the Independent Listing operation is expected to be 100 percent, given that a completion by observation is allowed as a last resort.

Completed Independent Listing BCUs will be automatically reviewed for unusual characteristics, such as GPS information indicating that the lister was far from the units they were listing. BCUs with unusual characteristics may be subject to quality control (QC), wherein QC listers return to the field to check a portion of units to ensure that the work performed is of acceptable quality and to verify that the correct BCUs were visited. If the BCU fails the QC, then the QC lister verifies the entire BCU.

3. Methods to Maximize Response

The lister will explain the reason the Census Bureau is conducting this operation, and respondents will be informed of their legal responsibility to answer the questions. In addition, respondents will be assured that their answers are confidential. The automated instruments contain the minimum number of questions necessary to obtain the data required for the 2020 PES, and the lister will make up to three attempts to make contact with a respondent.

4. Testing of Procedures or Methods

Nothing will be tested during the Independent Listing operation.

5. **Contacts for Statistical Aspects and Data Collection**

Andreana Able
Coverage Measurement Operations Branch
Decennial Statistical Studies Division
U.S. Census Bureau
301-763-0153

Definition of Terms

Components of Census Coverage – The components of census coverage include correct enumerations, erroneous enumerations, whole-person imputations, and omissions. Correct enumerations are people or HUs that were correctly enumerated in the census. Erroneous enumerations are people or HUs that were enumerated in the census but should not have been. Examples of erroneous enumerations are duplicates, nonexistent HUs or people, and people or HUs that were enumerated in the wrong place. Omissions are people and HUs that were not enumerated in the census but should have been. Lastly, whole-person imputations are census records for which all of the demographic characteristics were imputed. Many of these imputations represent people in HUs where we knew the household count but did not obtain sufficient information about the people residing at the HU.

Net Coverage Error – Reflects the difference between the true population (which is estimated by the Post-Enumeration Survey) and the census count. If the census count was less than the actual number of people or HUs in the population, then we say there was an undercount. If the census count was more than the actual number of people or HUs in the population, then we say there was an overcount.

For more information about the Post-Enumeration Survey Program, please visit the following page of the Census Bureau's website:
https://www.census.gov/coverage_measurement/post-enumeration_surveys/