Occupational Requirements Survey
Sample Design Evaluation

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Abstract
The Bureau of Labor Statistics (BLS) is working with the Social Security Administration (SSA) to carry out a series of tests to determine the feasibility of using the National Compensation Survey (NCS) platform to accurately and reliably capture data that are relevant to the SSA's disability program. The proposed new Occupational Requirements Survey (ORS) is envisioned to be an establishment survey that collects information on the vocational preparation and the cognitive and physical requirements of occupations in the U.S. economy as well as the environmental conditions in which those occupations are performed. This paper builds on the evaluation that was presented at the 2013 Federal Committee on Statistical Methodology Research Conference that described the advantages and disadvantages of integrating the sample design of ORS with the sample design of NCS. This paper presents an analysis of the sample design options that were considered for this proposed new survey and describes the sample design being used in the pre-production test for ORS. It also describes the design issues that need to be resolved before full survey implementation.

Key Words: survey design, occupational data, integrated surveys, survey cost

1. Introduction

In the summer of 2012, the Social Security Administration (SSA) and the Bureau of Labor Statistics (BLS) signed an interagency agreement, which has been updated annually, to begin the process of testing the collection of data on occupations. As a result, the Occupational Requirements Survey (ORS) was established as a test survey in late 2012. The goal of ORS is to collect and publish occupational information that will replace the outdated data currently used by SSA. More information on the background of ORS can be found in the next section. All ORS products will be made public for use by non-profits, employment agencies, state or federal agencies, the disability community, and other stakeholders.

An ORS interviewer attempts to collect close to 70 data elements related to the occupational requirements of a job. The following four groups of information will be collected:

- Physical demand characteristics/factors of occupations (e.g. strength, hearing, or stooping)
- Educational requirements
- Cognitive elements required to perform work
- Environmental conditions in which the work is completed

Field testing to date has focused on developing procedures, protocols, and collection aids using the NCS platform. These testing phases were analyzed primarily using qualitative techniques but have shown that this survey is operationally feasible. Now it is time to turn our attention to the survey design to ensure that we have the best possible sample design to meet the needs of the ORS. This paper presents an analysis of the sample design options that were considered for this proposed new survey and describes the sample design being used in the pre-production test for the ORS. It also describes the design issues that need to be resolved before full survey implementation.

2. Background Information on ORS

In addition to providing Social Security benefits to retirees and survivors, the Social Security Administration (SSA) administers two large disability programs, which provide benefit payments to millions of beneficiaries each year. Determinations for adult disability applicants are based on a five-step process that evaluates the capabilities of the worker, the requirements of their past work, and their ability to perform other work in the U.S. economy. In some cases, if an applicant is denied disability benefits, SSA policy requires adjudicators to document the decision by citing examples of jobs the claimant can still perform despite restrictions (such as limited ability to balance, stand, or carry objects) [1].

For over 50 years, the Social Security Administration has turned to the Department of Labor's Dictionary of Occupational Titles (DOT) [2] as its primary source of occupational information to process the disability claims. SSA has incorporated many DOT conventions into their disability regulations. However, the DOT was last updated in its entirety in the late 1970's, and a partial update was completed in 1991. Consequently, the SSA adjudicators who make the disability decisions must continue to refer to an increasingly outdated resource because it remains the most compatible with their statutory mandate and is the best source of data at this time.

When an applicant is denied SSA benefits, SSA must sometimes document the decision by citing examples of jobs that the claimant can still perform, despite their functional limitations. However, since the DOT has not been updated for so long, there are some jobs in the American economy that are not even represented in the DOT, and other jobs, in fact many often-cited jobs, no longer exist in large numbers in the American economy. For example, a job that is often cited is "envelope addressor," because it is an example of a low-skilled job from the DOT with very low physical demands. There are serious doubts about whether or not this job still exists in the economy.

SSA has investigated numerous alternative data sources for the DOT such as adapting the Employment and Training Administration's Occupational Information Network (O*NET) [3], using the BLS Occupational Employment Statistics program (OES) [4], and developing their own survey. But they were not successful with any of those potential data sources and turned to the National Compensation Survey program at the Bureau of Labor Statistics.

3. Overview of Potential Survey Design Options

To develop sample design options for the ORS, BLS reviewed the sample designs for the NCS [5] and other BLS surveys, including the OES and Survey of Occupational Injuries

and Illnesses [6]. Since the ORS will be collected by trained Field Economists who also collect the NCS data, potential coordination with the NCS sample design was a key factor of consideration. So we identified four basic categories of ORS survey designs allowing for different potential levels of coordination with NCS:

1. Fully Integrated Survey Design – where the NCS establishment sample would be a subsample of the ORS establishment
2. Independent Survey Design – where the ORS establishment samples would be selected using a design appropriate for SSA's needs, the NCS establishment samples would be selected using the current NCS sample design, and there would be no control on the amount of establishment sample overlap between the samples selected for the two surveys
3. Separated Survey Design – where the NCS establishment sample would be selected from the frame, the selected NCS establishments would be removed from the frame, and an independent ORS establishment sample would be selected from the rest of the frame
4. OES-ORS Integrated Design – where the ORS establishment sample would be selected as a subsample of OES establishment sample

The next four sections of this paper will describe each of these options in more detail. For each option, we will describe several pros (reasons to implement the design) as well as some potential drawbacks from implementation. For the first two design options, we will also describe the results of some empirical evaluations conducted using sample simulations. Although the sample size for ORS has not been finalized yet, we assumed that the ORS sample would need to collect data from 10,000 establishments annually for all sample simulations and evaluation work. Section 8 of the paper describes the sample design being used for the pre-production test of ORS that will start in the fall of 2014. Section 9 of the paper wraps up with some conclusions and recommendations for future work.

4. Fully Integrated Survey Design Options

Under this design, we would select an ORS establishment sample each year and then select the NCS establishment sample as a subset of the bigger ORS sample. This approach was used by the NCS program when a locality wage sample was a part of the integrated NCS sample design. We would collect the ORS data from all establishments in the NCS initiation sample. If a current NCS update establishment is selected for the ORS portion of the sample, we would need to collect the ORS data elements for the existing NCS jobs.

For simulation purposes, we assumed an annual ORS sample size of 10,000 establishments. Since the current NCS sample size includes approximately 3,200 establishments to be initiated each year, we assume that we would collect the ORS data elements (and not the NCS data elements) from the 6,800 ORS establishments not included in the NCS subsample.

This design option poses some challenges that will need to be overcome in order to implement it. The primary challenges are listed below.
- How should we select the samples to meet the needs of both sets of desired outputs – NCS and ORS?
- NCS samples State & Local government establishments once each decade. Will this approach work for ORS? If not, how will we handle this segment of the economy for ORS?

- Will the same sample rotation strategy work for both?

Some of the reasons we would want to use a fully integrated survey design option include the following:
- Ability to generate linked outputs such as wage percentiles by portion of the day lifting/carrying specified weights;
- Eliminates individual establishment burden associated with having to provide data separately for more than one survey program;
- Lower data collection costs;
- May be able to use the existing NCS sampling, nonresponse adjustment, and benchmarking systems; and
- NCS has experience doing this.

Some of the reasons we may not want to use this approach include:
- Increased interview length for establishments in both surveys is likely to have negative impact on establishment response rates for NCS and ORS;
- Respondent fatigue may result in lesser quality data; and
- Potential increase in item nonresponse rates.

For these purposes, testing a design meant that we took a recent sample frame and selected at least 150 samples from that frame. We then computed some basic information from each of those samples and averaged the data across all the samples. In general, we were looking for a sample design that allowed us to select an ORS sample to meet the ORS needs – that is a sample that has enough establishments in each industry but not too many and resulted in the total frame employment when we calculated the sum of the weighted employment across all establishments. For NCS samples, we wanted to be able to select the NCS desired sample sizes for each industry and geographic area AND have a total weighted employment that matches the frame employment. For each option considered, we used the NCS sample design and establishment selection methods with only the changes described below.

4.1 Fully Integrated – All NCS Design

Under this approach, we used the NCS design and allocation to pick both the ORS sample and the NCS subsample. This meant that we selected the ORS sample the same way that we pick the NCS sample – just with a larger sample size. So when we oversampled an industry in NCS due to wide dispersion of wages and/or lower response, we used the same target percentage of sample for the ORS allocation.

As expected, simulations showed that this design worked relatively well for NCS in that the industry distribution was very close to the targeted distribution, the full sample size was achieved, and the weighted employment was close to the frame total. However, the ORS sample was too big in industries that may not need a particularly large ORS sample, such as the Finance, Insurance, and Colleges & Universities industries. Given the unweighted results from the feasibility tests conducted in 2013, described in the Phase 1 [7], Phase 2 [8], and Phase 3 [9] Summary reports, we feel that the NCS industry distribution may not be ideal for ORS as it provides too much data in some industries where the occupational requirements data do not show a wide dispersion.

The following table highlights some industries where the ORS sample size was at least two times larger under NCS Design than under a proportional to employment design:

Industry	Average ORS Sample Size Using…		Percent Difference
	NCS Design	Proportional to Employment Design	
Insurance	1,505	506	198%
Finance (Rest of)	2,489	845	194%
Junior Colleges, Colleges & Universities	704	259	172%
Utilities	307	136	126%

4.2 Fully Integrated Design with Different ORS and NCS Allocations

With the current NCS sample design, we explicitly ensure that we select the desired number of establishments for each aggregate industry. We distribute the total number to be selected in each industry to the geographic cells in proportion to the total employment in each area of the country for that aggregate industry. Then we implicitly stratify and adjust the measures of size to select the establishments in a manner that ensures that we select the target number of establishments in each of the detailed industries across the country as a whole.

Under this approach, we allocated the ORS sample size to each industry and geographic area stratum in proportion to the stratum employment. This allowed us to set allocations for ORS directly in proportion to total employment, reducing the number of establishments we sample in some industries compared to the all NCS design. We were satisfied with the ORS sample sizes and employment totals that resulted from this approach. The average weighted employment totals were very close to the frame employment.

The following table provides simulation data for the industries with the largest percentage difference between the frame employment and the average ORS sample weighted employment:

Detailed Industry	Average Employment		Percent Difference
	Frame	ORS Sample	
Elementary and Secondary Schools	661,077	657,960	-0.5%
Junior Colleges, Colleges & Universities	1,164,474	1,167,206	0.2%
Mining	617,765	616,707	-0.2%
Insurance	2,076,306	2,072,942	-0.2%
Other Services (except Public Admin.)	3,741,681	3,737,766	-0.1%

However, we were unable to achieve acceptable NCS sample sizes and employment counts using this approach. We tried this five different times with slight variations on the process each time in an effort to achieve better results. But the results were pretty much the same. For all simulations in which ORS was selected with an allocation strictly proportional to employment, there are 'shortages' of frame units in certain cells targeted by our measure

of size adjustments. These cells are smaller than the sample cells, so the ORS sample design does not ensure enough units in each geographic area. Therefore, the measure of size (MOS) adjustments do not help us attain our target sample sizes in all detailed industries.

The following table highlights the industries where over 10% of NCS sample size was lost using MOS adjustment factor approach to subsampling NCS:

Industry	Average NCS Sample Size		Percent Difference
	Independent Design	Subsample of ORS	
Real Estate, Renting, Leasing	215	162	-24.7%
Mining	86	66	-23.8%
Hospitals	251	210	-16.3%
Total	9,804	9,792	-0.1%

Note that the sampling method allowed much of the "loss" in these industries to be absorbed by other related industries (for example, Construction and Manufacturing absorbed some of the losses from the Mining industry). However, not all losses could be completely accounted for, so the full sample was short of the target size.

4.3 Fully Integrated Design – Inside Out Option

For the Inside Out Design, we turned the current NCS sampling cells inside out while ensuring that we still selected the target number of establishments in each aggregate industry and in each detailed industry. Under this design, we created 24 sampling cells, one for each detailed industry including aircraft manufacturing and implicitly stratified within each sampling cell for 24 geographic areas. The ORS sample was allocated to each industry in proportion to industry employment, and the NCS sample allocations were set to the current NCS sample sizes in each industry.

We were again satisfied with the sample sizes and employment counts of the ORS sample. The sample distribution was not substantially different from that under the previous approach (see section 4.2).

The NCS sample was also acceptable under this approach. For private industry, the overall NCS detailed industry counts met the NCS targets. NCS counts by the 24 geographic areas were close to the area counts using the current NCS sample design. The largest difference between the two designs was an increase of 3.5% in Rest of West North Central Census Region. Fourteen of the 24 NCS geographic areas had sample sizes that differed by less than 1% compared to the current design. We believe that these differences were acceptable. But we will need to conduct much further analysis to evaluate regional workloads, anticipated response rates, impact on publications, impact on the number of quotes available for estimation, etc. before making a choice to implement this design.

The table below shows the industries with largest percentage difference between the sample sizes for the current NCS design and the sample sizes for the design where NCS is a subsample of ORS using the Inside Out design:

Detailed Industry	Average NCS Sample Size		Percent Difference
	Current NCS Design	Subsample of ORS	
Educational Services (Rest of)	58	57	-1.7%
Management of Companies and Enterprises	73	74	1.3%
Elementary and Secondary Schools	91	92	0.7%
Arts, Entertainment, Recreation	104	103	-0.7%
Mining	86	87	0.6%

This table identifies the geographic areas with the largest percentage difference between the sample sizes for the current NCS design and the sample sizes for the design where NCS is a subsample of ORS using the Inside Out design:

Area	Average NCS Sample Size		Percent Difference
	Current NCS Design	Subsample of ORS	
West North Central Census Division	597	617	3.5%
San Jose-San Francisco-Oakland, CA CSA	253	246	-3.0%
Detroit-Warren-Flint, MI CSA	154	150	-2.7%
New England Census Division	224	229	2.3%

5. Independent Survey Design Options

In this design, we would select a sample of ORS establishments from the sample frame using a sample design that works well for ORS. Each year, we would also select an independent sample of NCS establishments from the same frame, using the current NCS sample design. No special procedures would be implemented to control, reduce, or maximize overlap between the two independent establishment samples. Under this survey design, BLS will have two separate collection options, one in which ORS data elements are collected for all NCS and ORS sampled establishments (i.e. Joint Collection) and one in which ORS data elements are collected only for establishments selected in the ORS sample (i.e. Independent Collection). With Independent Collection, some NCS establishments will be asked to provide ORS data elements if they are also sampled in the ORS sample but the rest of the NCS establishments would not be asked to provide ORS data elements.

Under the independent design, the survey scope will match the NCS survey scope which encompasses all businesses in the 50 States and the District of Columbia that are Private, State Governments, or Local Governments. It will exclude private households and agriculture industry. The ORS sample will be selected from the same frame as the NCS – primarily the BLS Quarterly Census of Employment and Wages Database which is compiled based on Unemployment Insurance filings by businesses across the country. Unlike NCS which creates sampling strata based on 5 aggregate industries and 24 geographic areas, we will stratify by 24 major industry groups. ORS Sample allocation will be proportional to employment in each of the major industries with no adjustments for

response rates or level of accuracy (since these are unknown at this time). If we are using the Joint Collection model, the ORS-only allocations will be reduced by the number of establishments selected in the NCS sample for each of the 24 industries before we select the ORS independent sample. The decision about whether or not to collect ORS data from NCS respondents has not yet been made and will be evaluated using the results from a feasibility test on joint collection conducted in FY 2014 and from the pre-production test results (see Section 8).

For ORS, we will select 24 independent establishment samples each year, one in each of the 24 industry groups. We will implicitly stratify the sample by geographic area to ensure a fair distribution of the sample across the country. Each sample will be selected using a systematic PPS technique without replacement. For every establishment in the sample, a sample of jobs will be selected with input from the respondent during initiation. This process is also a PPS selection. When a job is selected, we collect data for all workers in the job. The measure of size for each of the two stages of sampling is the employment in the establishment or job.

We know that there will be some overlap of establishments from sample to sample and from the NCS to ORS samples under this approach and that the amount of overlap is important. So we selected 150 NCS simulated samples, 150 ORS simulated samples assuming that ORS data will be collected from the NCS sample (joint collection with an ORS sample size of 6,800 establishments a year), and 150 ORS simulated samples assuming that ORS data will NOT be collected for every establishment in the NCS sample (independent collection with an ORS sample size of 10,000 establishments a year). Both sets of samples were split into three groups (Year 1, Year 2, and Year 3) assuming a three year rotation.

In our research of the option under which ORS data are collected from all NCS establishments, the amount of overlap between the ORS-only portion of the sample and the NCS portion of the sample was minimal. Less than 5% of each NCS sample overlapped with ORS at some point during the three-year sample design.

Amount of overlap in NCS sample between NCS and ORS-only establishments

Type of NCS-to-ORS Overlap	Year of NCS Sample Design		
	Year 1	Year 2	Year 3
NCS unit is ORS-only unit in ANY year of three-year design	4.24%	4.20%	4.20%
NCS unit is ORS-only unit in SAME year of three-year design	2.24%	2.11%	2.13%

Since the ORS-only portion of the sample is larger than the ORS/NCS portion, there was less overlap when looked at from the ORS perspective.

The amount of overlap between ORS-only establishments and NCS establishments was a bit higher under the option where ORS data are not intended to be collected from any NCS establishments. The higher amount of overlap for this option was expected, because the size of the ORS-only sample was larger at 10,000 establishments a year. The amount of overlap is about twice as large for the NCS sample, and about a tenth of each NCS sample overlaps with ORS at some point during the three-year sample design.

Amount of overlap in NCS sample between NCS and ORS-only establishments

Type of NCS-to-ORS Overlap	Year of NCS Sample Design		
	Year 1	Year 2	Year 3
NCS unit is ORS-only unit in ANY year of three-year design	10.27%	10.11%	9.95%
NCS unit is ORS-only unit in SAME year of three-year design	6.51%	6.43%	6.35%

Some of the reasons for using an independent survey design option include:
- More flexibility to make changes in the future than any variation of the fully integrated design option
  - ▶ This option gives us the ability change either (NCS or ORS) design without changing the other design.
  - ▶ This option allows us to make changes to either design at the best point in time for that design without forcing us to change both designs at the same time.
  - ▶ This option allows us to move from Joint Collection to Independent Collection for NCS establishments without changing the sample design, if necessary.
  - ▶ In the unlikely event that BLS funding for ORS should go away, there would be no impact on the NCS sample design.
- This option allows us to proceed with an optimal design for ORS to best meet the needs of the SSA.
- This option does not have any impact on the NCS sample design since we can have a different sample design for ORS than for NCS.
- This option allows us to have different rotation patterns for NCS and ORS such as 3 years for NCS and 3, 5, or 10 years for ORS, if desired.
- The joint collection option provides us with the ability to generate linked outputs such as wages by amount of time sitting each day, if desired.
- The joint collection option results in lower data collection costs than an independent data collection option.

Some of the challenges to using an independent survey design option include:
- If we implement the independent collection option, we would not have the ability to generate linked outputs.
- Increase in resource demand during sample selection and systems development and maintenance.
- Increased data collection costs for independent collection option when compared to the joint collection option due to the larger ORS sample size.
- Increase in resource demand during data review and analysis if we are not able to collect ORS data from all NCS respondents.
- Some added complexity to the computation of final ORS weights for estimate calculations due to the different sample designs for joint collection option
- Some added complexity to the ORS variance computation methods due to the different sample designs for joint collection option

Based on the evaluation of this design to date, it appears that the independent design for sampling establishments will be the best choice for implementation. However, we would

still like to evaluate potential response rates for this design, develop expected levels for published outputs, and further analyze the most appropriate way to handle large enterprise firms with many establishments in the sample frame. This includes evaluating response rates for all ORS samples and for establishments in the portion of the sample for which both ORS and NCS data elements would be collected. In addition, we need to evaluate the potential for nonresponse bias for these samples, especially if establishment response rates fall below 80% during the pre-production test described in Section 8. Research is proceeding in these areas and will be completed before final long-term production decisions are made.

6. Separated Survey Design Options

Under this design, we would pull the NCS sample from the frame first. Then we would remove those units from the ORS frame and draw a sample of ORS units from what is left over. We would collect both NCS and ORS data from the establishments in the NCS sample. We would collect only the ORS data from the establishments in the Rest of ORS sample. So this only works with joint collection for NCS establishments.

Potential issues with this design:
- Establishments are sampled independently so one establishment within a large enterprise in which all collection occurs centrally (usually at corporate headquarters) could appear in the NCS part of the sample and other establishments in the same enterprise could show up in the rest of ORS sample. Is there a way to sample these large enterprises as a group (for NCS and ORS) to reduce this issue?
- This approach also requires a more complex weighting scheme for ORS estimation than either the Fully Integrated or Independent Sample Design options, but we believe that it is doable.

Due to a lack of resources, this option has not been fully evaluated for use in a production environment using sample simulations. While it would eliminate the overlap between NCS and ORS selected samples each year while providing flexibility in the design for the Rest of ORS portion of the sample, there are several challenges with this option. First, it is quite likely that establishments in a Rest of ORS sample could already be reporting data for a prior NCS sample so the option does not eliminate all sample overlap. Also, the Rest of ORS sample would not reflect a full sampling frame so the weighting process for computing estimates would be more complex than under the previous design options. Additionally, it is very likely that large enterprises would have establishments in both portions (NCS and Rest of ORS) of the sample making is more difficult to collect data for these large firms. At this time, the benefits of controlling initiation overlap are outweighed by the other issues with the design so it will not be considered further for selection of production samples.

7. OES-ORS Integrated Design

The Bureau of Labor Statistics conducts another survey which collects occupational information from establishments in the United States, the Occupational Employment Statistics survey. This is a mail survey which is used to generate mean annual wages and employment for detailed occupations in the U.S. economy. Two samples are selected and collected for this survey each year with data from the most recent six samples (three years) used to compute annual estimates. The samples are drawn in a manner that ensures that

establishments appear in one and only one of the six samples used in each set of estimates. Data on the occupations employed by each business establishment, the number of employees, and the wages for those employees is collected via a mail survey. Since this survey collects data about the occupational mix in each establishment, it may be advantageous to use the collected data from the OES as the sample frame for ORS. This could allow ORS to target specific occupations needed for disability determination decisions as part of the sample design. However, there is some concern about the age of the data and the potential survey error and lack of efficiency that this could introduce. So, we have not yet begun an evaluation of this potential design but plan to do so at some point in the future.

8. ORS Pre-Production Test Sample Design

Beginning in the fall of 2014, BLS plans to conduct a nation-wide pre-production test to evaluate ORS survey processes and operations in a possible production environment at the request of the Social Security Administration (SSA). Data collection and capture will run for approximately six months and will conclude in the spring of 2015. A full evaluation of the data elements captured for this pre-production test will be followed by an evaluation of the processes, survey design, and other test program elements. In order to fully evaluate the potential for implementing the ORS in a production environment, BLS will use the Separated Sample Design approach to select the establishments included in the test as described below. All of ORS Pre-production's projected 2,550 sample establishments will be collected once for all of the ORS data elements.

The ORS Pre-production sample will include a combination of both ORS-only establishments as well as those that currently exist within the NCS (National Compensation Survey). All units will be selected using a 2-stage stratified design with probability proportional to employment sampling at each stage. The first stage of sample selection will be a probability sample of establishments, and the second stage of sample selection will be a probability sample of jobs within sampled establishments. For more information on the current NCS sample design as well as factors explored for an ORS sample design, see the American Statistical Association (ASA) papers by Ferguson et al titled, "Evaluating Sample Design Issues In the National Compensation Survey" [10], "Update on the Evaluation of Sample Design Issues in the National Compensation Survey" [11], and "State and Local Government Sample Design for the National Compensation Survey" [12] as well as the Federal Committee on Statistical Methodology (FCSM) paper by Rhein et al titled, "Sample Design Considerations for the Occupational Requirements Survey" [13]. Each sample of establishments will be drawn by first stratifying the establishment sampling frame by defined industry and ownership. The industry strata for private industry as well as state and local government are shown on the next page and are based on the North American Industry Classification System (NAICS).

After the sample of establishments is drawn, jobs will be selected in each sampled establishment. The number of jobs selected in an establishment will range from 4 to 8 depending on the total number of employees in the establishment, except for government and aircraft manufacturing units and units with less than 4 workers. In government, the number of jobs selected will range from 4 to 20. In aircraft manufacturing, the number of jobs selected will range from 4 for establishments with less than 50 workers to 32 for establishments with 10,000 or more workers. In establishments with less than 4 workers,

the number of jobs selected will equal the number of workers. The probability of a job being selected will be proportionate to its employment within the establishment.

The total ORS pre-production sample will consist of approximately 2,550 establishments. The private portion of this sample will be approximately 85% (2,168) with one-third (716) of that coming from current NCS sample units. The remaining two-thirds (1,452) of the private sample will be selected from a national frame not to include any other existing NCS sample units. This frame will be stratified by NAICS based on the 24 detailed industry cells as defined above. The state and local government sample will be approximately 15% of the total sample (382) with one-third (126) of the units selected from the existing NCS sample and the remaining two-thirds (256) selected from a national frame not to include existing NCS sampled establishments.

The sample allocation process starts with a total budgeted sample size. Since some of the sample for the ORS Pre-production test will be selected from the NCS design, the same industry definitions (based on ownership and NAICS as defined in charts below) will be used to select both the NCS overlap sample as well as the ORS-only sample. Due to the differences in the selection of the original NCS samples, different sampling strata will be used for the samples selected from existing NCS samples than from the new ORS-only samples. The sample will be allocated proportionally by ownership and industry using total employment within each sample cell for ORS-only samples and total weighted employment for samples drawn from NCS samples.

The ORS Pre-production test will select a sample consisting of both NCS sample units as well as ORS-only units. The portion selected from the existing NCS sample units will use systematic sampling with probability proportionate to measure of size. The measure of size (MOS) will be the sample unit employment times its NCS sample weight.

For the ORS only sample, units will be selected from a frame that excludes all existing NCS sample units. This frame will be stratified by ownership and industry as defined above, with each sample cell being sorted by area (using the 24 area definitions in the NCS design – see below), establishment employment, and establishment identification number. These units will be selected using a probability proportional to size approach based on the unit's employment as it was reported to on the state unemployment file.

Sample weights will be assigned to each of the selected establishments in the sample to represent the entire frame. Units selected as certainty will be self-representing and will carry a sample weight of one. The sample weight for the non-certainty units will be the inverse of the probability of selection.

ORS Pre-production Stratification for Private Industry

Aggregate Industry	Detailed Industry	Included NAICS Codes	# Companies in Universe	Sample Size
Education	Educational Services (Rest of)	61 (excl 6111-6113)	78,008	11
Education	Elementary and Secondary Schools	6111	16,899	14
Education	Junior Colleges, Colleges and Universities	6112, 6113	8,023	15
Finance, Insurance and Real Estate	Finance (Rest of)	52 (excl 524)	279,462	64
Finance, Insurance and Real Estate	Insurance	524	185,133	39
Finance, Insurance and Real Estate	Real Estate, Renting, Leasing	53	349,578	43
Goods Producing	Mining	21	34,579	14
Goods Producing	Construction	23	744,370	122
Goods Producing	Manufacturing	31-33	334,610	224
Health Care, incl. Hospitals and Nursing Care	Healthcare, Social Assistance (Rest of)	62 (excl 622, 623)	1,230,175	194
Health Care, incl. Hospitals and Nursing Care	Hospitals	622	8,419	68
Health Care, incl. Hospitals and Nursing Care	Nursing and Residential Care Facilities	623	72,659	66
Service Providing	Utilities	22	17,130	10
Service Providing	Wholesale Trade	42	619,782	121
Service Providing	Retail Trade	44-45	1,031,277	308
Service Providing	Transportation and Warehousing	48-49	225,026	75
Service Providing	Information	51	143,541	47
Service Providing	Professional, Scientific, Technical	54	1,075,999	177
Service Providing	Management of Companies and Enterprises	55	58,245	40
Service Providing	Admin., Support, Waste Management	56	485,943	161
Service Providing	Arts, Entertainment, Recreation	71	127,658	38
Service Providing	Accommodation and Food Services	72	647,059	240
Service Providing	Other Services (excl Public Administration)	81 (excl 814)	563,765	76

ORS Pre-production Stratification for State and Local Government Industry

Aggregate Industry	Detailed Industry	Included NAICS Codes	Establishments in Universe	Sample Size
Education	Elementary and Secondary Education	6111	62,349	150
Education	Colleges and Universities	6112, 6113	7,416	39
Education	Rest of Education	61 excl 6111-6113	1,281	1
Financial Activities	Other Service-producing - Part A	51, 52-53	1,961	2
Goods Producing	Goods-Producing	21, 23, 31-33	6,350	4
Health Care, incl. Hospitals and Nursing Care	Hospitals	622	2,377	21
Health Care, incl. Hospitals and Nursing Care	Nursing Homes	623	1,679	5
Health Care, incl. Hospitals and Nursing Care	Rest of Health	62, excl 622-623	8,546	9
Service Providing	Trade, Transportation, and Utilities	42, 44-45, 48-49, 22	12,764	14
Service Providing	Public Administration	92 excl 928	107,694	122
Service Providing	Other Service-producing - Part B	54-56, 71-72, 81 excl 814	18,462	15

9. Conclusions and Future Work

BLS has conducted much testing to evaluate various alternative sample designs and has determined that there are statistically viable designs under both the Fully Integrated and Independent Design options. Given the additional flexibility of the Independent Design and the ability of implement that design with no change in the NCS design, the Independent Design is currently being strongly considered for implementation with the first production sample selection process for ORS. However, no decision has been made at this time about the amount of acceptable overlap between the ORS and NCS samples. Selection of the final design for use in an on-going production survey is dependent on many factors such as response rates, anticipated survey accuracy levels, the impact of ORS data collection from NCS respondents, and survey budget for which we do not yet have data. Response rates, anticipated survey variances, and the impact of joint NCS and ORS data collection

will need to be evaluated using the results of the pre-production test to help guide the final design decision. Survey budget numbers also need to be fully evaluated and vetted with the Social Security Administration. These activities are scheduled to occur in Fiscal Year 2015 and will be shared when available.

References/Footnotes

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