

Doing More with Less – Eliminating the Long Survey Forms from the Occupational Employment Statistics Survey

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ABSTRACT

Can a survey move from paper forms to electronic data collection without diminishing data quality and response rates? How does a survey balance the preferences and business practices of the establishments with the need for additional data while also achieving cost-savings? The Occupational Employment Statistics (OES) Survey, a large voluntary establishment survey, wrestled with a decision to solicit electronic payroll records and web submissions instead of using 24-page paper survey forms. OES analyzed mode and response rate data and trends and reviewed other research regarding data quality and collection modes. Analyses identified electronic data collection as the mode of choice for establishments for most, but not all size classes. Electronic data collection also facilitates the collection of point wages and job titles which are needed input for BLS research efforts such as auto-coding. In this paper and presentation we examine the research and data analysis used in the decision-making, as well as the impact of eliminating paper forms on mode choices, response rates, and survey costs.

Key words: Survey forms, establishment survey, cost-savings, paradata, electronic data collection, response rates

1. INTRODUCTION

The Occupational Employment Statistics (OES) Survey has faced a stagnant budget for several years while operational costs have increased. Electronic data submissions have increased with little to no intervention from data collectors. Submissions using paper forms seem to be on the decline, especially for larger establishments, in favor of submitting data online or by uploading or emailing an electronic payroll file. The Bureau of Labor Statistics wondered if it would be possible to shift more units from paper forms to electronic submission and still collect the same amount of data. OES examined how many paper forms were being returned, what the unit costs are for printing and postage, which respondents are already sending in electronic files, and what reasonable predictions could be made about the impact of eliminating long paper forms.

2. BACKGROUND

The Bureau of Labor Statistics (BLS) OES survey was designed to collect occupational employment data by mail, and was later expanded to collect wage data as well. The OES

survey is an establishment that is mostly voluntary. As of 2014, it was mandatory in seven states. It is primarily a mail survey. Data are collected by the State Workforce Agencies, in cooperation with the Bureau of Labor Statistics, US Department of Labor. OES data are collected and processed by analysts in state government offices.

Respondents report the number of employees by occupation and wage range. The occupational employment and wage data from sampled establishments are used to calculate employment estimates for nearly 800 occupations annually for the fifty states, the District of Columbia, Puerto Rico, the US Virgin Islands, and Guam, as well as for the nation as a whole. OES also produces employment and wage estimates for Metropolitan Statistical Areas (MSAs) and specific industries. Occupations are classified using the Standard Occupational Classification (SOC) system while industries are classified using the North American Industry Classification System (NAICS).

The OES survey is initially mailed to almost all establishments in the sample. The initial mailing is done by a central mail facility and occurs as close to the survey reference date as possible, either November 12th or May 12th. Three follow-up mailings are sent to non-respondents at approximately four week intervals. The long survey forms are used to collect data from establishments with more than fifty employees. Smaller establishments receive a write-in form. There are over one hundred industry-specific long forms with occupations already printed on them. Other modes of collection include email, online, telephone call, and fax. The percentage of total responses received via each collection mode for the November 2013 through November 2014 panels is shown in Table 1.

2.1 Data Collection Modes

There are seven methods used to collect OES survey data: mailed paper form, online, mailed printout from the establishment, telephone, personal visit, email, and fax.

Table 1. Respondent collection mode, November 2013 - 2014

Panel	Mail	Web	Printout	Phone	In Person	Email	Fax
Nov 2013	51.9%	17.4%	0.6%	12.4%	0.1%	11.9%	5.7%
May 2014	50.0%	17.9%	0.8%	13.1%	0.0%	12.1%	6.1%
Nov 2014	49.3%	17.0%	1.0%	12.0%	0.2%	14.6%	5.9%

Mailed Paper Form

The OES survey paper instrument consists of 97 industry-specific survey forms used for medium and large sized establishments and one open-ended survey form used for smaller establishments. A paper survey form is sent to all units in the sample. Respondents report employment data by occupation across twelve wage bands, using a matrix format. The industry-specific forms have occupations already printed on the form and range in length from 12 to 24 pages. In addition, there is one 32-page form for colleges and universities and a 44-page form for government units.

The occupations on each form are selected based on industry staffing patterns derived from previously collected data. Most survey forms cover a 3-digit NAICS industry, but some forms, due to heterogeneous staffing patterns, cover only a 4-digit or 5-digit NAICS industry. An example of a page from an industry-specific form is shown in Figure 1.

The 4-page open-ended form has space for respondents to write in the occupations found in their forms. This form is used primarily for small size establishments, and each state defines their own values for “small”; the cut off between small and medium establishments ranges from 9 to 99 employees, depending on state.

Figure 1. Example of a page from an industry-specific form

OCCUPATIONAL TITLE AND DESCRIPTION OF DUTIES	NUMBER OF EMPLOYEES IN SELECTED WAGE RANGES (Report Part-time Workers According to an Hourly Rate)													Total Employment
	A	B	C	D	E	F	G	H	I	J	K	L	T	
	Hourly (part-time or full-time) \$9.25	\$9.25 - 11.74	\$11.75 - 14.74	\$14.75 - 18.74	\$18.75 - 23.99	\$24.00 - 30.24	\$30.25 - 38.42	\$38.50 - 49.99	\$49.00 - 61.99	\$62.00 - 78.74	\$78.75 - 99.99	\$100.00 and over		
Annual Salary (full-time only) \$19,240	under \$19,240	\$19,240 - 24,439	\$24,440 - 30,079	\$30,080 - 38,999	\$39,000 - 49,919	\$49,920 - 62,919	\$62,920 - 80,079	\$80,080 - 101,919	\$101,920 - 128,959	\$128,960 - 163,799	\$163,800 - 207,999	\$208,000 and over		
Management Occupations (Managers in this section generally have other managers/supervisors reporting to them.)														
Chief Executives - Formulate policies and provide overall direction of private and public organizations within guidelines set up by a board of directors or other governing body. Plan, direct, or coordinate operational activities with the help of subordinate executives and managers. 11-1011	A	B	C	D	E	F	G	H	I	J	K	L	T	
General and Operations Managers - Plan, direct, or coordinate the operations of public or private organizations. Responsibilities include formulating policies, managing daily operations, and planning the use of materials and human resources, but are too general to be classified in any one functional area of management or administration. Excludes First-Line Supervisors. 11-1021	A	B	C	D	E	F	G	H	I	J	K	L	T	
Financial Managers - Plan, direct, or coordinate accounting, investing, banking, insurance, securities, and other financial activities of a branch, office, or department of an establishment. 11-3031	A	B	C	D	E	F	G	H	I	J	K	L	T	
Industrial Production Managers - Plan, direct, or coordinate the work activities and resources necessary for manufacturing products in accordance with cost, quality, and quantity specifications. 11-3051	A	B	C	D	E	F	G	H	I	J	K	L	T	
Farmers, Ranchers, and Other Agricultural Managers - Plan, direct, or coordinate the operation of farms, ranches, greenhouses, aquacultural operations, nurseries, timber tracts, or other agricultural establishments. May hire, train, and supervise farm workers or contract for services to carry out day-to-day activities. May engage in or supervise planting, cultivating, harvesting, and financial and marketing activities. Excludes "First-Line Supervisors of Farming, Fishing, and Forestry Workers." 11-9013	A	B	C	D	E	F	G	H	I	J	K	L	T	

Online Data Submission

Respondents have the option of submitting data online via a secure data collection site hosted by BLS. The Internet Data Collection Facility (IDCF) allows for secure file uploads of existing payroll files, as well as for data entry. The individual state offices design the solicitation materials sent with the survey forms to respondents in their state. Some states have been reluctant to advertise the online data submission option to respondents, while others have chosen to promote it.

Telephone

All responses that are received via the telephone are coded as a telephone response. This includes responses from respondents that call the state to report their data, and responses collected during state-initiated phone calls during nonresponse follow-up. States often focus on calling smaller establishments, which are easier to collect over the phone. Telephone non-response prompting begins at various times throughout the panel and is at the discretion of the state office.

Email

OES email data collection began in November 2004. It began slowly due to State reluctance to advertise the option. However, email usage has continued to grow and in the May 2014 panel, 22,000 establishments submitted their data via email.

Fax

Some establishments send in their data via fax. We are unsure why a respondent would choose to fax such a lengthy form rather than mail it in the postage-paid envelope we provide, but we offer the option nonetheless.

Hardcopy Printout and Personal Visits

These response methods are uncommon. Some respondents print their data and mail the hard copy to the state collecting the OES data. The printouts are usually from the respondent’s payroll records. Most printouts have a variety of information on them, usually more than the employment and wages that OES is requesting. Personal visits are reserved for large establishments and establishments that are critical to generating valid estimates. Personal visits are very costly and time-consuming and therefore rarely used.

2.2 State Survey Administration

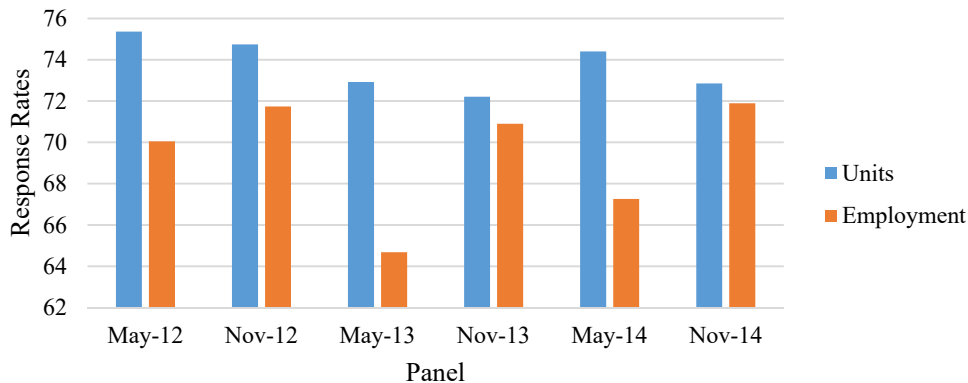
The OES data is collected by State Workforce Agencies following general federal guidelines, but states are allowed the flexibility to use different practices and procedures. The contract for this work is a Cooperative Agreement, which sets response rates requirements for the collection of the data. States must collect 75 percent of the units in their sample, and 65 percent of the employment contained in their sample.

States use different survey procedures, such as the timing of telephone non-response follow-up. Based on a 2006 questionnaire (Phipps and Jones, 2009), approximately 58 percent of states begin telephone follow-up calls after the first survey mailing, 24 percent begin after the second mailing, and 20 percent begin after the third or fourth mailing. The response rates requirements have an influence on how states pursue data collection and non-response prompting. For example, they will call establishments with a large number of employees (instead of those with fewer employees) if they are in danger of not meeting their 65 percent employment requirement.

2.3 Historical OES Response Rates

OES response rates are fairly consistent over time¹, as shown in Figure 2 below.

Figure 2. OES response rates by units and employment, May 2012 - November 2014

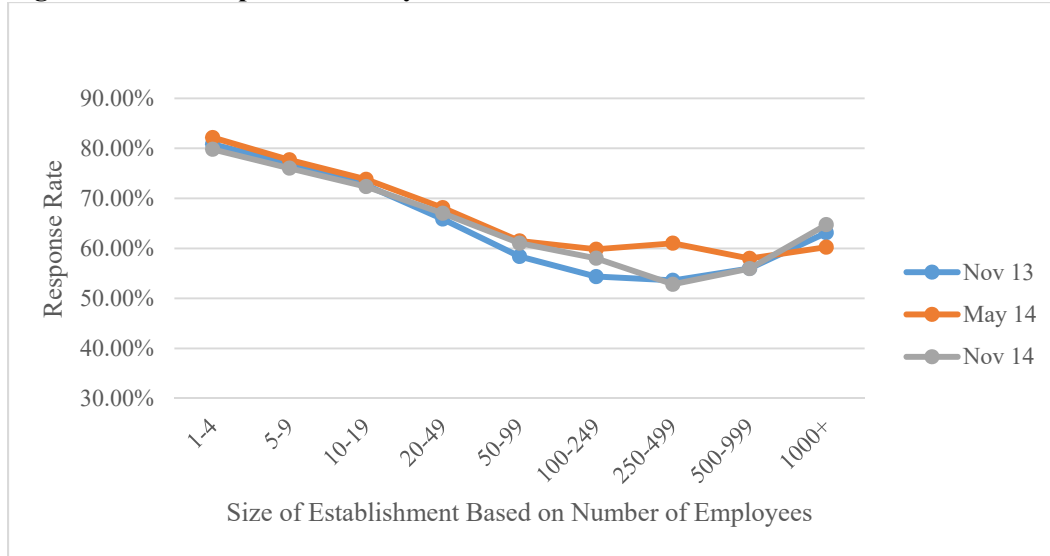


¹ May 2013 responses suffered from the federal government shutdown.

Response Rates by Employment Size

Response rates grouped by the size of the establishments (based on the number of employees) show that small establishments have much higher rates than large establishments, up to 27 percentage points difference. Firms with 250 to over 1,000 employees show some increases in the response rates over time. It is assumed that larger firms are more likely to have the technology to provide data by means of electronic filing and they are more likely to use it for completing the OES survey. In addition, many of the establishments in the larger size classes have staff dedicated to completing government forms and surveys.

Figure 3. OES response rates by size of establishment, 2013 - 2014



3. PREVIOUS RESEARCH

As was mentioned earlier, state data collectors have different practices and motivations for choosing which units to pursue in their non-response prompting. This influences response rates, which was confirmed in discussions with some state supervisors and managers. If a state needs to meet their unit response rate deliverable, they usually will focus on collecting data from the smallest units by calling these establishments on the phone. Likewise, if the state needs to meet their employment response rate deliverable, they will focus on contacting the establishments with the greatest number of employees. The most diligent data collectors and supervisors will try to distribute their collection efforts across all the different industries so they can have a diverse data set.

BLS conducted a study in 2010 to see if it would be possible to predict mode preferences (Jones and Phipps, 2016). This research showed that larger establishments and establishments in larger metropolitan statistical areas (MSAs) are more likely to respond electronically, either online or by email. A Response Analysis Study (RAS) conducted in 2012 revealed that many respondents responded using a paper form, but would have preferred to respond using an electronic method (BLS, 2013). However, since they received a paper form in the mail, they simply filled it out and returned it in the mail. Many respondents reported that they were not aware that they could respond electronically.

Based on the research on predicting mode preferences, BLS field-tested a new collection strategy of sending “tailored” letters inviting larger establishments to respond electronically to the survey, in lieu of sending a survey form (BLS, 2012). The test proved successful: response rates were maintained while printing and postage costs declined. Following this study, BLS gave states the option of using tailored letters instead of survey forms. Several states opted to send the letters only to the largest establishments (those with more than 250 employees) and still send forms to the medium-sized establishments (those with 50-249 employees). However, eight states used the tailored letters to solicit data from large- and medium-sized establishments, thus completely eliminating their use of the long survey forms.

4. METHODOLOGY

For this study OES examined several data sources. OES used the microdata for individual establishments in the November 2013 OES survey, approximately 189,800 establishments. Of those, 137,500 responded to the survey and 52,300 did not. OES also used some of the data contained in the administrative records collected by the BLS Quarterly Census of Employment and Wages program in order to find the benchmark employment and geographic information for the establishments in the OES sample. OES leveraged paradata collected and logged in along with the November 2013 microdata such as the collection mode and date stamp. Other sources include reports from the print contractor about the number of forms sent out, the type of forms that were mailed, and their cost. OES used the name and address files used for each of the November 2013 mailings and mapped them to the microdata so that they could tell how many mailings each establishment received. Finally, OES determined postage costs by examining USPS postage receipts containing the cost & number of outgoing survey packets and number of forms mailed back to state data collectors.

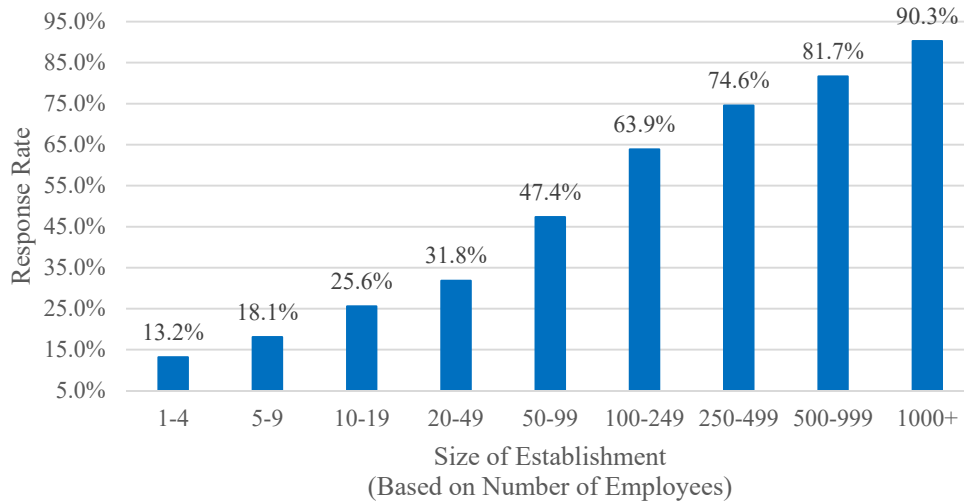
5. ANALYSIS

Using the specified inputs, OES calculated and analyzed several metrics. Response and non-response rates, response rates stratified by the size of the establishment (based on the number of employees), response rates for each type form, response rates for states using tailored letters, the number of long forms mailed and the number of forms returned, and the cost per unit solicited.

5.1 Response Rates by Size of the Establishment

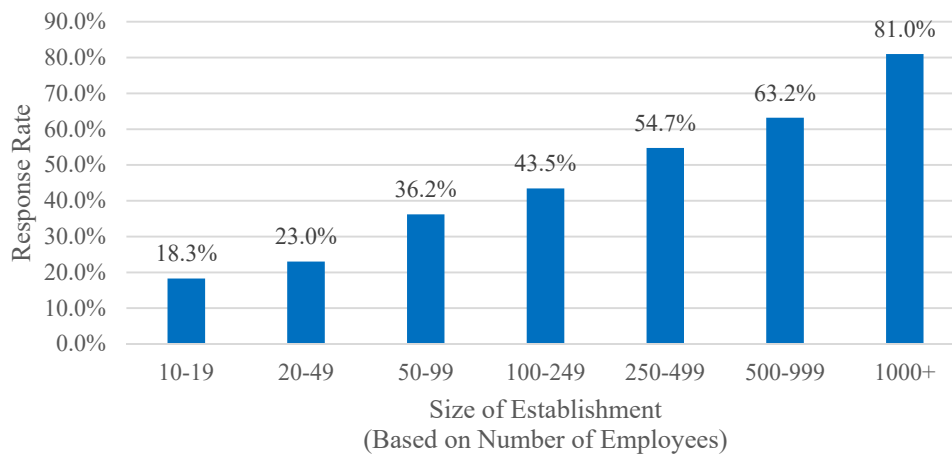
Figure 4 shows the percentage of all electronic responses, either online or via email. Overall, it is evident that larger firms are submitting their responses electronically. They are clearly capable of producing the appropriate data and either uploading a file online or emailing the data to the state. A portion of even the smallest establishments submitted their data electronically as well.

Figure 4. Percent of responses received electronically, November 2013 panel



We also wanted to know more about the effectiveness of the long forms. We looked specifically at units that were sent a long form to see what modes respondents used to respond. In the November 2014 panel, OES mailed out long forms to 55,000 establishments. In most cases, the units received multiple mailings. Only 29 percent, 16,000 establishments, filled out and returned the form. 14,500 of the establishments that were sent a form submitted data electronically. Figure 5 shows the percentage of units by size that responded electronically after being sent a form.

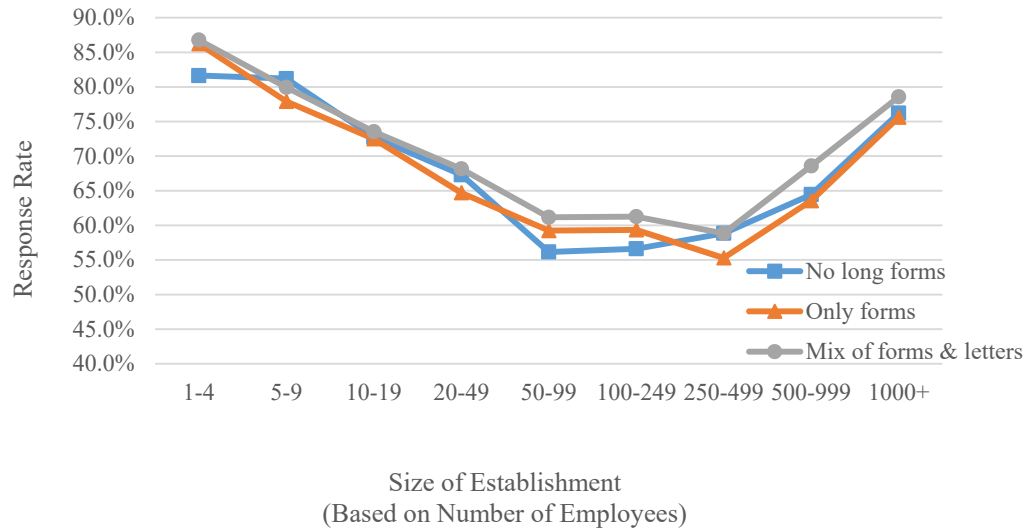
Figure 5. Percentage of units that responded electronically after receiving a long form, November 2013



5.2 State Response Rates

Each state is responsible to meet response rate requirements for collecting OES data. They also have some latitude in how they go about collecting the data, and BLS gives the state options in terms of the data collection instruments. Specifically, the states can choose which establishments receive long forms and which receive a tailored letter inviting the establishment to submit data electronically. Some states use a mix of tailored letters for the largest establishment and survey forms for the medium-sized establishments. Some states do not use any long forms while some states only use forms. All states send the write-in form to the small establishments with fewer than 20 employees.

Figure 6. State response rates by method and establishment size, November 2013



For this analysis, state microdata was classified and grouped by the overall state methodology: No long forms (n=22,030), Only forms (n=101,373), or Mix of long forms and letters (n=66,465). Figure 6 shows state response rates by the different methodologies employed by the state office. States using a mixed collection strategy of forms and letters have the highest response rates. Most of these states are only sending long forms to size classes 4 and 5.

Table 2. Response rate by size and state methodology, November 2013

	Size 1 1-4	Size 2 5-9	Size 3 10-19	Size 4 20-49	Size 5 50-99	Size 6 100-249	Size 7 250-499	Size 8 500-999	Size 9 1000+	Total
No long forms	81.6%	81.2%	72.7%	67.3%	56.2%	56.6%	58.8%	64.4%	76.2%	71.4%
Only forms	86.2%	77.9%	72.5%	64.7%	59.2%	59.3%	55.3%	63.6%	75.6%	71.9%
Mix of letters & long forms	86.8%	79.9%	73.5%	68.2%	61.2%	61.3%	58.8%	68.6%	78.6%	73.6%

An interesting finding – there are variations in response rates for establishments in size classes 1 and 2 despite all of these units receiving write-in forms for all methodologies. Likewise, establishments in size class 8 also has variations in the response rates between

the Mix group and the No long forms group, even though all of those units received tailored letters. This is evidence that state data collection practices have a stronger influence on response rates than collection mode.

5.3 Treatment Response Rates by Establishment Size Class

This analysis looks at the individual establishment microdata (regardless of state office responsible for collecting the data) and grouped the records by what particular treatment the establishment received: Long form (n=54,944), Tailored letter (n=15,368), or Write-in form (n=119,557). As was mentioned earlier, the write-in form is reserved for the smaller establishments with fewer employees since it only contains a limited amount of space for writing in employee occupations. The write-in form is a successful tool for generating response and is fairly inexpensive to produce, so it is not the primary focus of the analysis. We are most interested in determining if tailored letters can replace the long forms entirely.

Solicitation method alone does not explain differences in response rates, but it does show differences in response trends. Figure 7 shows the response rates by establishment size and treatment.

The write-in form given to units in size class 3 (10 – 19 employees) has a higher response rate than the units that were given the long form. This is not a surprising finding since many states have reported success using the form for this group.

Units in size class 4 (20 – 49 employees) and size classes 7 through 9 (more than 250 employees) have a higher response rate when sent a tailored letter asking for an electronic response. Units in size classes 5 and 6 have a higher response with a long form than with a letter asking for an electronic response. A chi square analysis looking at the relationship between treatment and response did not show any significance between the long forms and tailored treatments.

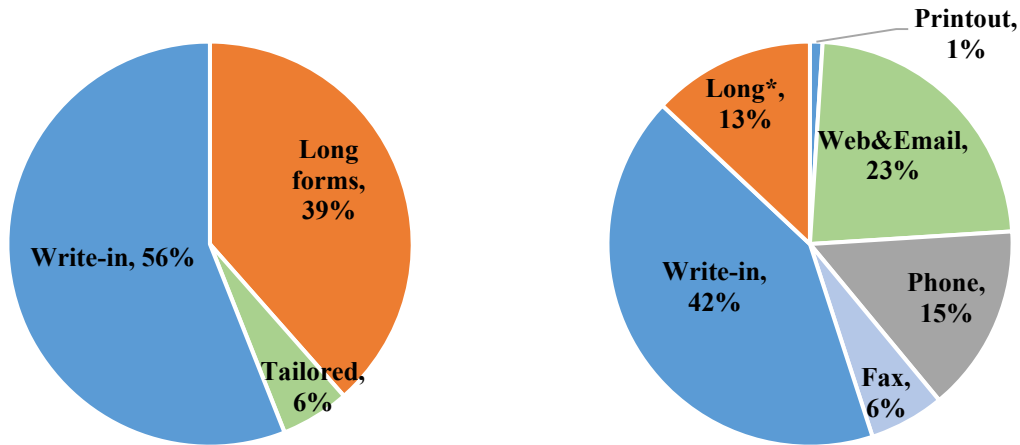
Figure 7. Response rates by size and treatment type, November 2013



5.4 Cost and Response Data

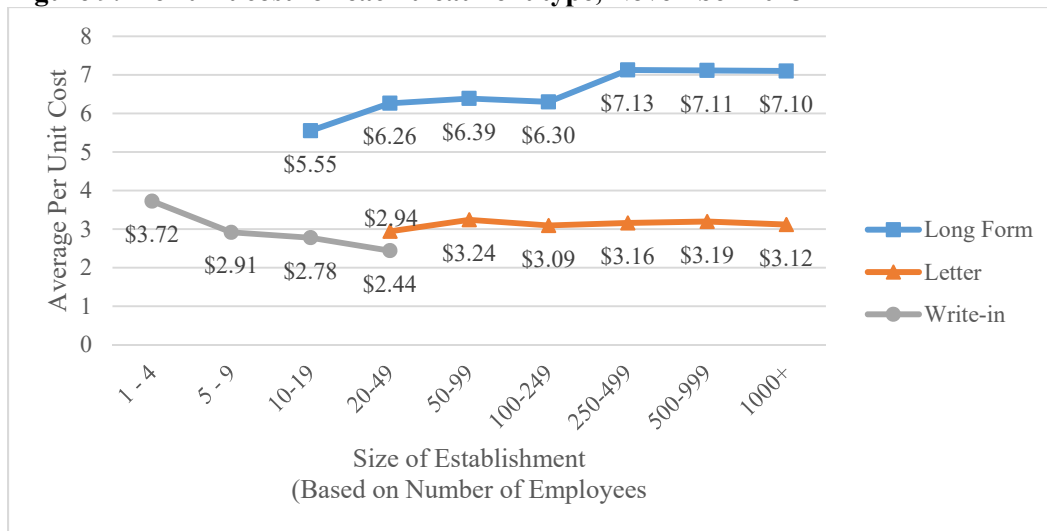
Using postage receipts and mailout address files, we calculated how much printing and postage costs were incurred for each unit in the sample. This was compared against the mode return percentages. Long forms make up 39% of printing and postage costs, but make up only 13% of the responses².

Figure 8. Expenditures and responses by mode, November 2013



Taking the number and type of mailings each unit received and applying the appropriate printing and postage costs, we were able to calculate an average per unit cost by size for each treatment. The per unit cost for units receiving long forms is substantially higher than for units receiving write-in forms or tailored letters. The per unit costs associated with the long forms are even higher when you factor in the amount of staff time spent on non-response telephone prompting.

Figure 9. Per unit cost for each treatment type, November 2013



² The long form response rate is at most 13%, but it could be as low as 10%, since many of the responses come in after the final mailing, when only the shorter write-in forms are mailed. The records do not distinguish between the different form types.

6. CONCLUSIONS

Both long forms and tailored letters prompt electronic data submissions. The rate of electronic data submissions increases as the size of the establishment increases. State response rate performance is higher for those states using a mixed collection strategy of long forms and letters. However, while the response rates are higher for these states, states that do not use only tailored letters and states that only use long forms are still successful at meeting response rates. Looking at the treatment type itself and the relationship to response rates, we do not see any significant difference between using long forms versus using tailored letters. Finally, the long forms have a \$3-\$4 higher per-unit cost than the tailored letters.

Table 3. Summary of results

	Electronic submissions	State performance	Treatment performance	Cost
Long forms	Often result in electronic responses, especially in larger establishments	Response rates are lower than in states using tailored letters	Response rates are higher for medium-sized establishments; overall differences are not significant	Makes up 39% of printing and postage costs; much higher per-unit cost
Tailored letters	Often result in electronic responses, especially in larger establishments	Response rates are higher for states using a mix of letters and long forms	Response rates are higher for the largest establishments; overall differences are not significant	Makes up 6% of printing and postage costs; much lower per-unit cost

7. OUTCOMES AND FUTURE WORK

Based on the analysis, OES retired the long survey forms and transitioned to using letters requesting electronic payroll files for all establishments with more than 100 employees. This reduced the average printing and postage per-unit cost from \$4.57 to \$3.89. OES saw immediate savings, approximately \$324,000 for the November 2015 panel. Response rates were slightly lower than expected, but improved for certain groups of employers.

The next steps will be continuing to monitor the performance of the states that had to change their collection methodology and learn to process more electronic data submissions. Overall performance will need to be monitored to make sure response rates and data quality are not diminished. OES will also perform future analysis of the microdata to see if any specific establishments stop responding to the survey and to see if any previous non-responders begin responding.

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