

Improving Response Rates for the 2007 Census of Government Employment

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Abstract

In March 2007 the U.S. Census Bureau conducted the 2007 Census of Government Employment, a voluntary census of state and local governments measuring public civilian employment and payroll. The following methods were used in an effort to bolster response rates: training in non-response follow-up methods, targeted contact with chronic non-respondents prior to mail-out, mail-out of a reminder letter to non-respondents one month after the initial mail-out, substantial increase in site visits to chronic or large non-responding governments, and use of the National Processing Center’s telephone center to conduct non-response follow-up calls. The unit response rate improved from 76.5 percent in 2002 to 89.3 percent in 2007.

Keywords: Response rates, survey methods, establishment surveys, non-response

1. Introduction

For the 2007 Census of Government Employment, the U.S. Census Bureau decided to employ various methods in order to increase response rates. It is necessary to have a good response to the Census of Government Employment in order to publish high quality data in both the census and intervening years since census data are vital to the quality of the imputation, estimation, and sample design of the Annual Survey of Government Employment.

This paper will outline the methods used to increase the response rates as well as the equations used to measure the response over time.

In Section 2, we cover the background of the Census of Government Employment. Section 3 details the data collection methods for the 2002 Census of Government Employment. Section 4 gives an overview of the methods for increasing response rates for the 2007 Census of Government Employment. Section 5 outlines the methodology for

¹ This report is released to inform interested parties of research and to encourage discussion of work in progress. Any views expressed on statistical, methodological, or operational issues are those of the authors and not necessarily those of the U.S. Census Bureau.

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calculating response rates. Section 6 covers our conclusions and Section 7 suggests further research.

2. Background

The U.S. Census Bureau conducts a Census of Governments every 5 years (years ending in '2' and '7') as authorized under Title 13, United States Code, Section 161. The census covers three major subjects: (1) Government Organization, (2) Government Employment, and (3) Government Finance. The organization phase of the census compiles a universal list of governments, classified by type of government (i.e., counties, municipalities, townships, special districts, and school districts). This list of governments is then used as a universe for the government employment and government finance phases of the census. The government employment phase collects data on government employment and payroll and the government finance phase collects data on government revenue, expenditure, debt and assets.

The Census Bureau has been conducting a Census of Government Employment every five years since 1957. In order to reduce the reporting burden on governments, in the intervening years, the Annual Survey of Government Employment is used to collect identical government employment and payroll data. This is sent to a sample of approximately 1/8th of the governments in the universe. A new sample is drawn every five years (in years ending in '4' and '9') and is based on the most recent census data.

The population of interest for the census and annual survey includes the civilian employees of all Federal Government agencies (except the Central Intelligence Agency, the National Security Agency, and the Defense Intelligence Agency), all agencies of the 50 state governments, and all local governments (i.e., counties, municipalities, townships, special districts, and school districts) including the District of Columbia. For the 2007 Census of Government Employment, this amounted to 89,476 local governments (i.e., counties, municipalities, townships, special districts, and independent school districts). There were 90,986 local governments when including dependent school districts.

There are five different types of local governments: (1) counties, (2) municipalities, (3) townships, (4) special districts, and (5) school districts. Counties, municipalities, and townships are known as general-purpose governments and provide general government services (e.g., administration, corrections, parks and recreation, etc). Special districts provide either one (single-purpose special districts) or more (multi-purpose special districts) services and have enough administrative and fiscal autonomy to qualify as independent governments. An example of a single-purpose special district is a library district and an example of a multi-purpose special district is a water and sewer district. School districts provide public elementary, secondary and/or higher education services. School districts can be dependent on general-purpose governments or can have enough administrative and fiscal autonomy to qualify as independent governments.

The Census of Government Employment is a voluntary census that collects information on the number of full-time and part-time employees and their corresponding gross payroll amounts for the pay period that includes March 12. For general-purpose governments, colleges and universities, school districts and multi-purpose special districts, the data are collected by government function. For example, data for school districts are collected for instructional employees and non-instructional employees separately.

This is a mail-out/mail-back self-administered paper and pencil survey with an Internet reporting option. In addition, some governments have developed alternative reporting arrangements, known as central collection, wherein a central source reports data for multiple agencies in an electronic file format. See Table 1, for the response modal distribution for state and local governments that reported to the Census of Government Employment and for the governments that reported to the Local Government Directory Survey (G-30), which will be discussed in Section 4.1.

Table 1: Modal Distribution for 2007 Census of Government Employment			
	State Governments	Local Governments	G-30 Respondents
Web	21.3%	29.5%	20.0%
Paper	19.8%	50.4%	79.3%
Central Collection	55.0%	1.2%	0.0%
Other	4.0%	18.9%	0.7%

3. The 2002 Census Data Collection Methods

This section gives a general overview of the methods that were used for the 2002 Census of Government Employment in an attempt to achieve an acceptable response rate. These methods can be contrasted with the methods that were used for the 2007 Census of Government Employment.

The initial mail-out of the 2002 Census of Government Employment was completed on March 19, 2002. Follow-up mail-outs were conducted on June 14, 2002 and August 14, 2002. Survey forms were included in each mail-out.

During the organization phase of the 2002 Census of Governments, limited employment data were collected on the Local Government Directory Surveys. Total full-time employees, part-time employees and gross annual payroll were collected. While these data items are slightly different from the data items on the 2002 Census of Government Employment surveys, the data were used for the 2002 Census of Government Employment survey in the following circumstances. On May 29, 2002, before the first follow-up mail-out, special district governments reporting no employees on the Local Government Directory Survey were checked in as received for the 2002 Census of Government Employment. Also, near the end of the processing cycle, after all non-response follow-up efforts were exhausted, any data from the Local Government Directory Surveys that were deemed usable, were used for the Census of Government Employment instead of imputing data using prior year or hot-deck methods. Data were deemed usable if they were consistent with any prior year reported data after being adjusted to a monthly gross payroll and allocating full-time and part-time employees to the appropriate government functions.

Although a cost estimate was obtained from the Census Bureau's National Processing Center (NPC) in Jeffersonville, Indiana for creating a computer assisted telephone interview (CATI) system for non-response follow-up, it was beyond the resources available and was therefore not used. Instead, headquarters' staff, including a total of five analysts and one statistical assistant, and Governments Division clerks at NPC began making non-response follow-up telephone calls on June 7, 2002 and continued until September 30, 2002. No automated non-response system was available at the time, and

calls were made from lists printed from a database of non-respondents. Analysts trained the Governments Division NPC clerks on appropriate non-response follow-up procedures.

While in previous years Governments Division employed field staff to visit large non-responding governments, in 2002 the division no longer maintained a field staff. Therefore, site visits were not conducted with large non-responding governments.

Approximately four months prior to the close-out of the 2002 Census of Government Employment, the supervisory staff was re-structured, thus resulting in a one-month delay in closing out the Census and requiring analysts to focus their efforts on things other than non-response follow-up. Overall, the unit response rate decreased from 82.2 percent in 1997 to 76.5 percent in 2002.

4. Methods for Increasing Response Rates for 2007 Census

This section describes the methods used for the 2007 Census of Government Employment to bolster response rates: (1) collected data for special district governments on the G-30 form, (2) targeted contact with chronic non-respondents prior to initial mail-out, (3) mailed an endorsement letter, (4) mailed a reminder letter, (5) conducted non-response follow up training, (6) conducted site visits, and (7) contracted with the National Processing Center's Telephone Center to conduct non-response follow-up calls.

4.1 Collected Data for Special District Governments on the G-30 form

During the organization phase of the Census, the Local Government Directory Survey form (G-30) was mailed to special district governments. In addition to the government organizational data that were collected, employment and payroll data were collected. The employment and payroll data items collected were identical to those collected on the 2007 Census of Government Employment forms (E-3 and E-7). The E-3 is mailed to single-purpose special district governments while the E-7 is mailed to multi-purpose special district governments. Of the 38,185 special district governments in the universe, 72.8 percent are considered single-purpose special districts and 27.2 percent are considered multi-purpose.

The only difference between the G-30 form and the E-3 and E-7 forms was the time period for the requested data. The G-30 form requested monthly data for October 2006 while the E-3 and E-7 requested data for March 2007. In addition, because the G-30 form's primary purpose was to collect government organizational data, the G-30 form collected only total employment and payroll data while the E-7 form requested employment and payroll data by government function. For this reason, data for multi-purpose special district governments that completed the G-30 form were allocated to the appropriate government functions based on the prior year distribution.

Instructions on the G-30 form informed the governments that if they completed the employment portion of the G-30 form, they would not receive an E-3 or E-7 form. This was done to reduce respondent burden. In March 2007, the E-3 and E-7 forms were mailed to all special district governments in the 2007 universe that had not provided the employment data to the organization phase of the Census. Units reporting employment data on the G-30 form are identified in the data file released to the public because of the difference in reference date and the data collection instrument.

4.2 Targeted Contact with Chronic Non-Respondents Prior to Mail-Out

A few months prior to the initial mail-out of the 2007 Census of Government Employment, large, chronic non-respondent governments were identified using the following considerations: the last year it responded, whether or not it was affected by the 2005 weather disasters in Mississippi and Louisiana, its prior year total employment, and its sample weight from the previous sample. For example, governments in the hurricane affected areas of Mississippi and Louisiana that have not responded since the hurricanes were included on the list.

Starting February 7, 2007 many of these large, chronic non-respondent governments were contacted by phone or email by analysts to inform the governments about the survey and the importance of the census year data collection. The point of contact was established by using any prior year contact information that was available or targeting specific departments such as payroll or human resources. Where appropriate, an endorsement letter was attached to the emails. In addition, analysts informed the governments of the year of the most recent response and the current mailing address on record. This allowed many governments the opportunity to either verify or correct the mailing address prior to the initial mail-out.

This early contact of large, chronic non-respondent governments raised awareness of the survey, allowing the governments to watch for the survey after it was mailed. It also helped to improve the accuracy of the database used to pull mailing addresses.

4.3 Endorsement Letter

The initial mail-out of the 2007 Census of Government Employment was completed on March 26, 2007. Included in this mail-out was an endorsement letter. The endorsement letter was a letter to all governments signed by 16 directors of various government associations such as the National Association of Counties and the United States Conference of Mayors. This letter stated the importance of the successful completion of the census and requested each government to participate. The hope was that either the government itself or the employee completing the form would be a member of one of the associations and therefore more likely to complete the survey form. Before mail-out, this letter received a methodological expert review to ensure it was as effective as possible.

4.4 Reminder Letter

On April 26, 2007, a reminder letter was mailed to governments that had not yet responded. The purpose of this letter was to remind non-responding governments to complete the survey. The letter was signed by the Census Bureau director and contained no reference to whether the survey was voluntary or mandatory. No survey form was mailed with the letter. The letter politely requested the government to complete the previously mailed paper survey form or to complete the survey online at a web address provided. Each government's UserID was provided on the letter for use in completing the form online. In addition, the letter contained a brief paragraph explaining the purpose of the survey and a toll-free phone number for governments to call for additional assistance.

To keep the survey fresh on the minds of the governments, the reminder letter was mailed one month after the initial mail-out, a few days before the original deadline for completing the survey form. After the initial mail-out period, addresses were updated from Geography Division's database. In cases where the initial mailing address was incorrect, the early mailing of the reminder letter allowed for contact with the

governments earlier in the cycle than in prior years. All follow-up mailings were completed earlier in the survey cycle in an attempt to solicit responses more quickly.

For a few weeks following the reminder letter mail-out, analysts received hundreds of phone calls per day from governments who had received the reminder letter. The calls consisted of governments requesting new forms, questions about how to complete the survey form, questions about how to complete the web forms, and questions on other various needs. For governments that were leaning towards not responding to the survey or who have a policy of not completing voluntary surveys, this provided analysts the opportunity to explain why the data are important and answer any questions about what data should or should not be included. Many small governments opted to report their data over the phone and analysts were able to obtain data that otherwise might not have been reported.

4.5 Non-Response Follow-up Training

Staff members who routinely contacted governments received formal refusal avoidance training that better prepared them to work with reluctant governments. For the 2007 Census of Government Employment, two main groups were trained on refusal avoidance: (1) the clerks at NPC who primarily answer incoming telephone calls about missing forms or answer frequently asked questions about the form and (2) the analysts who primarily place outgoing telephone calls concerning data errors and to conduct non-response follow-up.

Refusal avoidance training was specifically selected because it aims to increase survey cooperation and improve data quality by focusing on basic telephone skills along with techniques to identify and address reluctance on the part of respondents. Refusal avoidance training is based on the principles of tailoring an interviewer's response to a particular respondent's concern and maintaining interaction with the survey respondent. The training is based on research by Groves and McGonagle (2001) which outlined four main steps for conducting refusal avoidance training: assembling respondents' concerns, developing responses to those concerns, training interviewers to classify concerns, and training interviewers to provide quick and appropriate responses. The key to this training was to provide interviewers with several responses to the same concern and the skills needed to apply them quickly and accurately. For more information on Refusal Avoidance Training, see O'Neill (2007).

While the analyst training is similar to the clerk training, analysts do not typically receive specialized training on telephone call mechanics and often benefit from the telephone skills discussion in addition to the refusal avoidance skills. After receiving the one-day training, both groups said that the training gave them more confidence in their jobs, helped them better prepare for telephone calls, and helped them to build rapport with other clerks and analysts and bond as a unit. It also provided them with the opportunity to learn from each other and disseminate information across the whole group of clerks and analysts involved. Clerks especially felt the training allowed for open communication with survey managers and staff from Census Bureau headquarters, with whom they often have little personal contact.

4.6 Site Visits

Between March and September 2007, 13 staff members (including Governments Division employees, contracted employees, and employees from other divisions in the Census

Bureau) visited 676 governments throughout the country to encourage their response. Visit locations were selected around large, chronic non-respondent governments.

Efforts were made to schedule appointments with the appropriate government contact to discuss possibly creating an alternative reporting arrangement or to identify a way in which the Census Bureau could help them complete the survey form. This involved identifying the appropriate department to contact (i.e., human resources, payroll, personnel, etc) and requesting that an information technology (IT) staff member be present to discuss the feasibility of setting up an automated system of reporting. When the analyst had time between scheduled visits, drop-in visits were conducted with other governments in the area. We found that for the most part, governments responded positively to our visits and felt that their response was important.

Staff members prepared folders to leave with the government offices. Included in the folder were a copy of the survey form, the director's letter, endorsement letter, prior year survey forms printed out for reference (if available), information on alternative reporting arrangements (where applicable), a business card of the staff member visiting, and a self-addressed, postage paid FedEx envelope for the easy return of the completed survey.

Of the 676 governments visited, 448 responded to the survey resulting in a cooperation rate of 66.3 percent. Of the 676 governments visited, 184 were considered chronic non-respondent governments. After the visits, 83 of the chronic non-respondent governments responded to the survey resulting in a cooperation rate of 45.1 percent. The cooperation rate is the percentage of governments that were checked-in as complete.

4.7 National Processing Center's Telephone Center

For the 2007 Census of Government Employment, Governments Division contracted with the NPC's Jeffersonville Telephone Center (JTC) professional interviewers to conduct non-response follow-up calls to most of the remaining non-respondent governments from May 3, 2007 to July 15, 2007. The non-response follow-up calls began soon after the initial survey completion deadline of April 30, 2007 to keep the survey fresh on the minds of the governments and to attempt to make any necessary corrections to addresses before the final form follow-up mail-out on June 1, 2007. Due to other obligations of JTC, the interviewers needed to finish by July 15, 2007.

Analysts created training manuals and worked with the JTC management to modify the existing headquarters telephone follow-up application to be used by the interviewers. This application provided a list of governments to call and allowed the telephone interviewers to record notes about the call and the action that was taken. It also enabled survey managers to generate reports to assist in managing the project. Analysts spent several days training more than 100 telephone interviewers, researchers, and supervisors on the details of the survey and the telephone follow-up procedures.

The interviewers were instructed to call to find out if the government unit received a form and when they might be able to complete it. If multiple calls to a government went unanswered, then the JTC researchers searched for a new phone number. If a government unit had no employees or would only report total line data, interviewers were instructed to take data over the phone. Interviewers continued calling until the unit reached a resolution. A unit was considered resolved if the data were received, the government unit representative refused to complete the form, or the unit was referred to analysts.

Interviewers were able to email, fax, or mail requested information to the governments as needed.

Interviewers called school districts first in an attempt to contact them before summer break. After the school districts were completed, they called special district governments and then general-purpose governments.

5. Calculation of the Response Rates

In addition to employing various methods of increasing response to the 2007 Census of Government Employment, a more accurate response rate calculation methodology was used than had been used in 2002. This section shows the new equations used to calculate the response rates for the 2007 Census of Government Employment and the differences between the response rates calculation methodology from the 2002 Census of Government Employment.

The unit response rates for the 2007 Census of Government Employment were calculated as described in Census Bureau Standard S18-0_v1.4, Response Rates Definitions. In particular, we used the response rate definitions given in Supporting Document B, S18-2_v1.6_Requirements_Economics. In Supporting Document B, three response rate definitions are given for use in calculating response rates on Census Bureau surveys of establishments: the Unit Response Rate, the Quantity Response Rate, and the Total Quantity Response Rate. For this census only the Unit Response Rate and Total Quantity Response Rate were published, so we will only cover those two rates in this paper.

The Unit Response Rate (URR) is the proportion of reporting units based on unweighted counts, that responded and were eligible, or of unknown eligibility, for the census (expressed as a percentage).

$$URR = [R/(E+U)] * 100$$

where

- | | |
|---|---|
| R | Number of reporting units selected for the sample that were eligible for data collection and classified as a respondent |
| E | Number of reporting units selected for the sample that were eligible for data collection |
| U | Number of reporting units selected for the sample for which eligibility could not be determined |

For the 2007 Census of Government Employment, a unit was classified as a respondent if it responded to full-time employees, full-time pay, part-time employees, and part-time pay for at least one government function on the questionnaire.

The Total Quantity Response Rate (TQRR) for data item t is the part of the estimated (weighted) total (T) of data item t that was reported by tabulation units in the sample or from sources deemed to be of equivalent-quality-to-reported data (expressed as a percentage). [Note: Since the value of economic data items can be negative, the absolute value must be used in the numerators and denominators in all calculations.]

$$TQRR = \left[\frac{\sum_{i=1}^{n_T} w_i \times (r_{ii} + q_{ii}) \times |t_i|}{T} \right] \times 100$$

where

- w_i weight of the i -th unit in the sample
- r_{ii} indicator variable for whether unit i provided a response to item t
- q_{ii} indicator variable for whether unit i was equivalent-quality-to-reported data for item t
- t_i value of variable t for unit i

In an effort to become compliant with the response rates standard in the dissemination of response rates for the 2007 Census, new edit and imputation flags for this survey were assigned to distinguish exactly how the data were processed. More edit situations were considered in the new assignment of flags. Some analyst corrections, which are actually imputations, previously carried edit flags that made it impossible to distinguish the imputation from a response. Also, between 2002 and 2007, the definition of a respondent changed. In 2002, a unit was a respondent if it responded with any usable data. Consequently, response rates for 2002 are not comparable to the response rates for 2007. The overall unit response rate, URR, for 2007 was 88.5 percent. TQRR, which is item specific, is available on the website for the 2007 Census of Government Employment for local governments data at <http://www.census.gov/govs/apes/index.html>.

In our publications, we display the URR and TQRR for 2007, but for this paper we also calculated a response rate using the 2002 response rate definition (a unit was a respondent if it responded with any usable data) to show the improvement in response rates from 2002 to 2007. For response rates that can be compared over time from 1997 to 2007, see Table 2. These response rates rose from 76.5 percent in 2002 to 89.3 percent in 2007 with the greatest gain being recorded for special district governments.

Table 2: Response Rates for the Census of Government Employment from 1997 to 2007

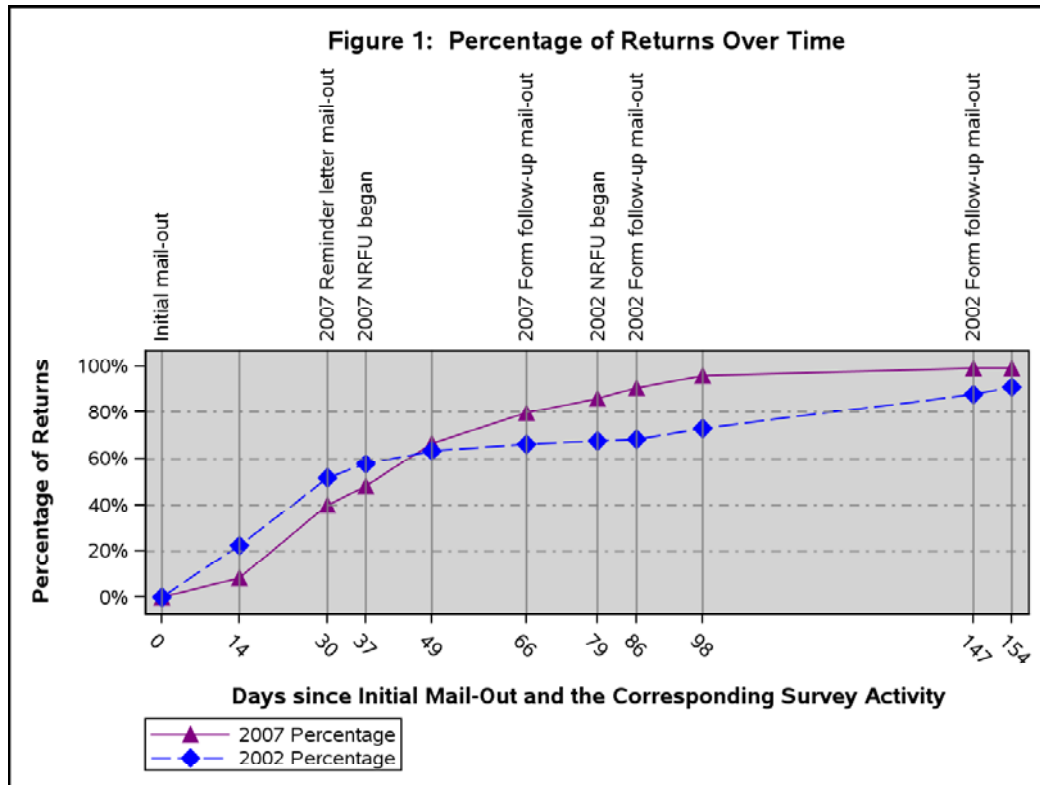
Type of Government	2007			2002			1997		
	Total	Number of respondents	Response rate	Total	Number of respondents	Response rate	Total	Number of respondents	Response rate
Total with Dependent School Districts	90,986	81,214	89.3%	89,021	68,128	76.5%	88,905	73,043	82.2%
Dependent School Districts	1,510	1,246	82.5%	1,496	1,094	73.1%	1,452	1,131	77.9%
Total without Dependent School Districts	89,476	79,968	89.4%	87,525	67,034	76.6%	87,453	71,912	82.2%
Counties	3,033	2,590	85.4%	3,034	2,268	74.8%	3,043	2,473	81.3%
Cities	19,492	17,524	89.9%	19,429	15,048	77.5%	19,372	16,490	85.1%
Townships	16,519	13,007	78.7%	16,504	11,807	71.5%	16,629	13,128	78.9%
Special Districts	37,381	35,283	94.4%	35,052	27,307	77.9%	34,683	28,520	82.2%
Independent School Districts	13,051	11,564	88.6%	13,506	10,604	78.5%	13,726	11,301	82.3%

Source: U.S. Census Bureau, Census of Government Employment, 1997-2007. For additional information, see: < <http://www.census.gov/govs/apes/index.html> >

6. Results

Because the methods were implemented in succession, without associated control groups, the individual effect of each method cannot be isolated. For example, for the 2007 Census of Government Employment non-response follow-up calling began one week after the mail-out of the reminder letter. In the month following, 15,921 forms were returned. It is impossible to say whether those forms were returned due to the reminder letter, the non-response follow-up calling, both, or neither.

However, it is possible to track when each unit was returned and compare the percentage of returned forms over time for 2002 and 2007. Figure 1 shows the percentage of returns over time along with the corresponding survey activities over time. Note that due to the difference in how special district governments and many state agencies were collected between the 2002 Census of Government Employment and the 2007 Census of Government Employment these units were excluded from the data in Figure 1.



In 2002, the early return rate was very good but it levels off between 37 days and 86 days after the initial mail-out. It is interesting to note that no non-response follow-up activities were conducted until 79 days after the initial mail-out in 2002. While in 2007, all the planned non-response follow-up activities were started within 66 days after the initial mail-out and instead of leveling off, the percentage of returned forms continued to climb through-out the observation period. In addition, in 2007, 154 days after the initial mail-out of the survey form, 99.2 percent of forms that were going to be returned were returned. However, at the same point in 2002, only 91.2 percent of forms that were going to be returned were returned. This suggests that repeated contact with non-respondents using multiple follow-up methods is effective in gaining responses (see Dillman et al., 2009, for a summary of literature on multiple contacts).

7. Conclusion

For the 2007 Census of Government Employment, the following methods were used in an effort to bolster response rates: collected data for special district governments on the G-30 form, targeted contact with chronic non-respondents prior to mail-out, mail-out of an endorsement letter with the initial mail-out, mail-out of a reminder letter to non-respondents one month after the initial mail-out, training in non-response follow-up methods, substantial increase in site visits to chronic or large non-responding governments, and use of the National Processing Center's telephone center to conduct non-response follow-up calls. The unit response rate improved from 76.5 percent in 2002 to 89.3 percent in 2007.

With the exception of collecting data for special district governments on the G-30 form, each of the methods described in this paper could be implemented by other economic surveys to offset declining response rates. It should be noted, that while each of these methods has an associated cost, it is our opinion that the substantial increase in response rates was worth the cost of implementing the procedures. In addition to raising the overall response rate, we were able to obtain data from 58.5 percent of the governments that were previously identified as chronic non-respondents (including governments that we did not have the opportunity to visit). Since imputed data are less precise the longer the time period from the last year of reported data, we believe that obtaining data from these specific governments has improved the quality of our estimates.

8. Further Research

The new sample for the 2009 Annual Survey of Government Employment has fewer township and special district governments than in the prior samples. This will allow for more time and effort to be spent in increasing the response rates for these types of governments in the intercensal survey years. In the future, we plan to examine the state by type of government item response rates more closely to determine where questionnaire item wording may need to be changed to boost item response. We will also be able to target non-response efforts by state and type of government. In addition, we will do a non-response bias study if time and resources permit.

References

- Dillman, D.A., J.D. Smyth, and L.M. Christian (2009). *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method*, John Wiley & Sons, New York.
- Groves, R.M., McGonagle, K.A., (2001). “A Theory-Guided Interviewer Training Protocol Regarding Survey Participation.” *Journal of Official Statistics*, 17, 249-265
- O’Neill, Grace E. (2007) “Improving the Effectiveness of Interviewer Administered Surveys through Refusal Avoidance Training.” *Proceedings of the 3rd International Conference on Establishment Surveys*, American Statistical Association, Alexandria, VA.
- U.S. Census Bureau. “Standard on Response Rate Definitions,” S18-2_v1.4, <http://www.census.gov/quality/quality_standards.htm>, June 21, 2007.
- U.S. Census Bureau. “Standard on Response Rate Definitions, Supporting Document B – Variables, Rates, and Formulae for Calculating Response Rates and Reporting Requirements: Economic Surveys and Censuses,” S18-2_v1.6_Requirements_Economic, <http://www.census.gov/quality/quality_standards.htm>, December 23, 2008.