EXAMINING STANDARDIZATION OF RESPONSE RATE MEASURES IN ESTABLISHMENT SURVEYS

Carl Ramirez, GAO; Sylvia Fisher, BLS;
Jaki Stanley McCarthy, NASS; Iris Shimizu, NCHS[1]

ABSTRACT

The Interagency Group on Establishment Nonresponse (IGEN) has studied issues associated with unit nonresponse in Federal establishment surveys and published proposals for research in this area. Previous work has documented the types of response rates calculated across a number of establishment surveys conducted by U.S. statistical agencies. In this paper, we review the similarities and differences among those rates, discuss the extent to which there is standardization in the calculation and publication of such rates and the reasons why this is so, and explore the possibilities, advantages, and disadvantages of fostering greater coordination and standardization across IGEN-member agencies in this regard.

1. INTRODUCTION

The purpose of this paper is to describe the results of a review of the similarities and differences in establishment survey response rates conducted by U.S. statistical agencies. The overall purpose of this study was to examine the variations in establishment survey response rates and consider the viability of standardization of response rates in government establishment survey. Our work builds upon a recent study by Shimizu (2000), who found that there was significant variation in the calculation of response rates for government establishment surveys.

Shimizu (2000) found that these variations in operationalization were present in response rate calculations computed within agencies for internal use, as well as for "official" reporting and publication purposes. The extent of variation in how response rates are operationalized raises the issue of whether it would be appropriate to have a greater degree of standardization among establishment survey response rates calculated in government agencies. To this, end, we have identified some potential steps that can be undertaken to implement a greater degree of

[1] The opinions expressed here are those of the authors and do not necessarily represent those of their agencies. This paper is based on the work of IGEN, whose members currently are: Stephanie H. Brown, U.S. Bureau of the Census (BOC); Sylvia Fisher, Bureau of Labor Statistics (BLS); David M. Friedman, BLS; Steven Kaufman, National Center for Education Statistics; Douglas G. Kleweno, National Agricultural Statistics Service (NASS); Ruey-Pyng Lu, EIA; Donald M. Luery, BOC; Jean C. Mah, BLS; Chris Manning, BLS; Antoinette Martin, Energy Information Administration (EIA); Herb Miller, EIA; Chester H. Ponikowski, BLS; Carl Ramirez, U.S. General Accounting Office; Robert Sabatelli, BLS; Iris Shimizu, National Center for Health Statistics; David Slack, BLS; Jaki Stanley McCarthy, NASS; Albert Tou, BLS; Clyde Tucker, BLS; Diane K. Willimack, BOC.

standardization within response rates across establishment surveys in different government statistical agencies.

This paper was produced by the Interagency Group on Establishment Nonresponse (IGEN), an inter-agency group composed of survey researchers charged with examining issues associated with unit nonresponse in Federal establishment surveys. The IGEN was formed in 1998 and charged with examining unit nonresponse in Federal establishment surveys. IGEN's mission also includes serving as a clearinghouse for information on establishment survey nonresponse research efforts, the review of government survey practices, and the promotion of inter-agency cooperation and collaboration on relevant research conducted by Federal agencies. Papers by IGEN (1998) and Ramirez (2000) provide a more comprehensive documentation of IGEN's membership, current and future goals, and the results of earlier work.

2. CURRENT RESPONSE RATE MEASUREMENT PRACTICES

Most recently, IGEN has profiled a number of government establishment surveys, including their procedures for measuring nonresponse. The group has examined how and why certain response rate measures are calculated for various surveys conducted by member agencies. Common approaches to response rate calculation in establishment surveys were discussed in IGEN's first paper (1998), and a detailed discussion of the formulae used in 48 government surveys was presented in Shimizu (2000). Table 1 summarizes the rates calculated by type of survey and whether or note the rate is published.

2.1. Variation in Practices

Inspection of Table 1 indicates that while most surveys use a variant of the most common rate S/E (i.e., usable responses as a proportion of sampled elements that were attempted and not found ineligible), there are a variety of measures used both internally and as “official” measures that may be published for data users. Several conclusions about the variations in how response rates are calculated can be drawn from this snapshot of some major Federal establishment surveys:

- **Elements included within the rate.** The main difference between rates is *what survey outcomes are included and excluded* from the numerator and denominator of the rates. For example, six (N=6) of the surveys we reviewed calculate as their "key rates" measures that include ineligible elements in the numerator of the rate (ineligibles are counted as meaningful outcomes) and thus are used more as "check-in rates" or "receipt rates" than response rates in the more typical "S/E" mode as described above

	Formula[1]	Total Surveys included	Published			Survey type		
			Yes	No	DK	Census	Cross-sectional[2] samples	Longitudinal[3] Samples
	All Surveys	48[4]	20	4	24	15	24	9
Unweighted Rates								
1	S/(E+NU)	5	5			5		
2	S/E	36	10	2	24	8	20	8
3	S/n	1	1					1
4	S+OOB+OOS / n-UAA	1	1			1		
5	S+OOB+UAA / n+NU	1	1			1		
6	S+OOB+OOS+DUP / n+NU	2		2			2	
7	S+OOB / N	2	2				2	
Weighted rates								
8	$\frac{\sum_S t_i}{\sum_E t_i}$	2	1	1		2		
9	$\frac{\sum_S w_i\, t_i}{\sum_E w_i\, t_i}$	11		11			11	
10	$\frac{\sum_S w_i}{\sum_E w_i}$	1	1				1	

[1] Disposition Codes used in these formulae:

R = Response rate.
S = Successfully completed (criterion for response status is met).
D = Some data received but not data required for respondent status.
R = Refusal (survey-eligible units for which a responsible authority was contacted and that authority deliberately declined participation in the survey).
O = Other or Pending (attempted survey-eligible units with no data received but not refusals or other final disposition).
n = Number of original units attempted in survey at start of data collection.
OOB = Deemed out-of-business (includes units that cannot be located).
OOS = Confirmed out-of-scope.
DUP = Confirmed duplicates of units already included in the survey.
UAA = Post office returns because of "undeliverable as addressed."
NAT = Original units at which data collection has not yet been attempted.
E = Attempted original survey units that were not deemed to be ineligible.
e = Estimated number of survey-eligible units.
NU = New units identified after data collection for survey started.
t_i = measure of size for i-th establishment
w_i = sampling weight for i-th establishment.

[2] "Cross sectional" surveys collect data only once from a sample before the sample is retired.
[3] "Longitudinal" surveys collect data multiple times from the same sample.
[4] Total differs from sum of surveys because some surveys have both weighted and unweighted rates.

- **Purpose of rate.** The *purpose or usage* of the rate is directly related to what outcomes are included within the rate. Some rates are calculated as "main" or "official" rates, while others serve specific purposes to help managers oversee the survey process.

- **Unweighted vs. weighted rates.** Some of the surveys use an *unweighted* rate that measures the coverage of the total quantity of the attribute being measured in a population, in addition to the unweighted rate of cooperation of individual establishments. The remaining surveys use a *weighted* rate.

- **Levels at which rates are calculated.** Different rates can be calculated for different *levels* of the data collection process (for example, NCES' Schools and Staffing Survey samples at the school level and the teacher and student levels).

- **Stages at which rates are calculated.** Rates can be calculated at different time periods in a *longitudinal* survey, for example at the time a sampled element is first initiated into the survey. Thus, a first contact may have a different rate that the one associated with a second or third contact.

The next section will expand on the issue of how these rates are used.

2.2. Usage of Different Response Rates

Table 2 breaks out each of the 48 surveys that we reviewed by the rates summarized above in Table 1, and expands on the uses of each rate calculated by agencies and survey program

managers for a variety of purposes. Some rates are calculated only for internal use, to be of help to staff designing or conducting surveys, while others are published for consumption by data users.

Survey managers told us that rates can be used for several purposes including:

- **Internal tracking.** Survey managers can internally track forms through the monitoring and management of receipts, which provides information that can be used to plan effective follow-up activities, as well as evaluate the success of survey collection efforts. Thus, the survey manager can evaluate the success of data collection operations, by identifying those "cuts" of the data that are likely to help improve internal quality thought the use of internal comparisons. For example, breaking down rates by field units or never contacted respondents vs. refusals provides different ways of looking at the problem of response rates and may suggest effective interventions that could be implemented to improve data collection efforts.

- **Assessing quality of data provided by responding establishments.** The assessment of data quality by responding establishments permits the tracking of imputation and helps determine whether values can be imputed.

- **Assessing frame quality.** Information such as determining whether an establishment is out-of-business or out-of-scope on relevant criteria can be used to identify problems within the sampling frame and inform survey managers about where interventions in the sampling frame might be useful.

- **Informing data users.** More and more, it is apparent that data users should know what elements comprise the response rate, so that they can more clearly comprehend what survey results actually mean. Despite this fact, however, some response rate computations are *not* designed to be shared with external data users.

We explored the ways in which "official" results that are published are actually disseminated. Some rates are published in official reports or methodology papers, while others are not widely released to the public.

2.3. Standardization: Policy and Possibilities

Standardization is designed to address collection and estimation purposes, and therefore, has potential implications for Federal statistical agencies. Several issues need to be addressed when undertaking a standardization effort in government surveys, as the following examples indicate:

- How should a response rate be computed? Should the rate only include the "perfect" schedule or form, the "worst possible" schedule or form, or schedules that fall somewhere in the middle? This decision is likely to affect interpretation of the rate.

- Should initiation refusals be included within the response rate formula and what consequences does the inclusion of these refusals have for interpretation of the response rate?

- How can response rates be improved? What sectors should be targeted for improvement and how should we identify these sectors? What types of comparisons yield the most information (e.g., comparing establishments by SIC, size, region, type of survey, data collection region, etc.)?

Clearly, many factors need to be considered when pursuing standardization of survey response rates in Federal agencies.

Currently, there are efforts underway at the Bureau of Labor Statistics (BLS) to evaluate the feasibility of standardizing establishment survey response rates for different BLS surveys. Similarly, this issue is being addressed in other governmental agencies concerned about the effectiveness and appropriateness of having standardized survey response rates for reporting purposes, including the Energy Information Administration and the U.S. Bureau of the Census. It is apparent that this issue is increasingly important to Federal statistical agencies intent upon achieving high establishment survey response rates while operating with limited resources.

3. ISSUES CONCERNING RESPONSE RATE STANDARDIZATION

IGEN considered the question of whether increased standardization of response rate measures was feasible and whether or not it should be encouraged across and within Federal statistical agencies that conduct establishment surveys. A review of even the limited sample of surveys described herein makes it abundantly clear that the use of different rates by different agencies and surveys is not accidental. Because there are distinct reasons for the generation of each of these different rates, standardizing to a single or even to a few response rates has both advantages and disadvantages. The advantages and disadvantages of standardization are reviewed below.

3.1. Standardization of Response Rates: Advantages

Increasing the comparability of response rate measures across survey programs is the primary argument for promoting more standardization. The potential gains from standardization are likely to resonate both within and across agencies. The following benefits might ensue from such across-survey comparability:

- **Promotion of methodological research.** It appears likely that standardization efforts would result in fostering methodological research. The first step in determining causes of nonresponse is to be able to accurately measure the extent of the problem. Comparability would increase the collective analytical power of similar methodological experiments conducted in different surveys -- the effective study sample size would be increased and replication of experiments would be more

meaningful. This would be particularly valuable in collaborative efforts spanning multiple agencies.

- **Comparability across federal surveys.** Response outcomes of individual organizations selected into the samples of more than one federal survey could be more meaningfully compared if the sample disposition codes were defined and applied consistently. This would apply to both within and across agency comparisons.

- **Response rates for establishments in multiple surveys could be compared.** Monitoring individual establishments' participation across multiple surveys has been suggested as a promising methodology for investigating the effects of survey burden and coordination of data collection efforts across different surveys. Unlike households in surveys, large or unique establishments may be included in samples for numerous surveys conducted by Federal statistical agencies. Standard disposition codes would allow consistent tracking of establishments in multiple surveys. While it is unlikely that response for individual establishments may be tracked across agencies in the near future, this may be crucial for maintaining cooperation across surveys within an single agency.

- **Survey performance benchmarks could be created and tracked.** Survey managers and agency officials could more easily benchmark this aspect of performance and quality of individual survey programs against others. This may help agencies to better assess the relative strengths and weaknesses of their survey programs, and simultaneously permit more effective direction of resources. From an agency perspective, this would allow response rates to be targeted in a way that might permit effective interventions to be deployed.

In addition to increased opportunity to benchmark performance, standardization might have methodological implications for data users and survey researchers. Examples of these gains include the following types of positive effects in the management of current establishment survey programs:

- **Movement towards standardization might allow general comparisons of response rates in household surveys to establishment populations.** While it may seem that these comparisons would seldom be made, Federal agencies that conduct both household and establishment surveys may be able to use this information to indicate where scarce resources are most needed to help improve response rates.

- **Response rates in OMB clearances would be comparable.** Standardization would also allow response rates reported to OMB from different Federal agencies to be meaningfully compared.

- **International comparison of response rates may be possible.** Standardization of establishment response rates may also extend beyond the U. S. Federal statistical system. Standardization could permit comparisons of response rates in similar

surveys of like populations to be drawn across countries. Currently, response rates from seemingly identical types of surveys with identical types of establishments conducted in different countries may reflect quite different response rate calculations.

- **Promotion of widespread publication of response rates.** Standardization might also encourage more programs that currently don't publish response rates to begin doing so, by making it easier to decide which rates to calculate and by raising the visibility and expectation of such practices in the federal statistical community.

- **Promotion of standards raises visibility of response rates and could encourage widespread calculation of response rates.** Similarly, standards and the expectation of their calculation may encourage the calculation of response rates where they are currently not being calculated at all.

- **Standards and increased visibility may help increase data users' understanding of the data.** Data users indirectly benefit from any uses Federal agencies make of response rates that improve data. However, data users might also benefit directly from standardization and the resulting across-survey comparability by gaining a better understanding of where their data is coming from and its potential limitations. Standardization could help data users better evaluate the quality of the data they are using. With standards, data users only have to learn what response rates are and what they represent once, eliminating the need to obtain and track this information for each survey. By highlighting response rates as one potential source of error, data users may also begin to understand that there are multiple sources of potential error in the data they use. Clearly, the more potential sources of error data users know about, the better able they will be to understand the limitations in their data.

- **Finally, standardization might help improve frame quality for different surveys maintaining separate frames of the same populations of businesses.** If disposition data was standardized, and different rates of ineligibles due to "out of scope" or "out of business" were identified, this might suggest frame improvements for one or more of the affected surveys.

3.2. Standardization of Response Rates: Disadvantages

As might be expected, in addition to the advantages afforded by standardization of response rates, there is also a series of concomitant disadvantages. The overarching disadvantage of attempting to foster standardization of response rates stems from the fact that most establishment survey populations and survey designs are unique. It is therefore difficult to identify one or a few "best" response rate measures. This is precisely why these types of comparisons are seldom made and comparing rates across surveys may not always be meaningful. Does it make sense to compare response rates for schools with those for hospitals, private businesses, jails or other dissimilar establishments? And just as it may be unwise to compare such disparate establishment populations, there may be few data users who ever use data from multiple sources and would need to make these comparisons. Standardization might not be as feasible in establishment surveys as in surveys of individuals or households.

Even if standardization were achieved, certain types of response rates may not be optimum for a given survey, and in fact, may even be misleading. For example, if the standard response rate were an unweighted one, but the single establishment with most of the item being estimated from the survey was a nonrespondent, a high response rate might be a very poor indicator of data quality indeed.

It would be difficult to select a single response rate for other reasons, as well. For instance, any single response rate chosen for a given survey may or may not be the one that data users want to see. It may be difficult for Federal agencies to identify the response rate preferred by that survey's data users. For agencies to learn data users' preferences in response rates, an additional expenditure of time and effort, resources already likely to be in short supply, would be needed.

As with any administrative change in an ongoing data collection program, there may also be significant costs associated with standardization:

- **More rates may have to be calculated.** It might be necessary for some agencies to maintain measures for "internal use" while creating new rates for publication. This may cost extra in resources, and could lead to confusion.

- **Time and effort would need to be expended.** Clearly, it would be necessary for agencies to expend considerable resources to complete the process of converting survey practices and information systems to new disposition codes and rate calculations.

- **Likely effect on time series.** The continuity of time series of response rate data might be interrupted as a result of standardization of response rates.

- **Finally, changing the "official" response rate commonly calculated and reported may have unforeseen implications for the OMB clearance process.** While response rates in OMB clearances would now be comparable across surveys, they would no longer be comparable to response rates submitted in earlier clearances; reported rates may increase or decrease significantly as a result of the standardization process.

3.3. Obstacles to Standardization of Response Rates

As described earlier, there are significant disadvantages which argue against implementing standardization of response rates; however, these are not the only impediments to the successful adoption of standardization. Implementation of standardization will always be quite difficult. Any movement toward standardization should begin with a clear understanding of the potential barriers that will be encountered along the way.

One of the most significant obstacles is the wide variety of populations and designs used in establishment surveys. Many general population surveys and household surveys cover similar populations and use similar sample and fieldwork designs. For example, many such surveys

define target populations such as "All non-institutionalized adults, 18 and over, currently living in the U.S." Survey designs often use similar random digit dialing protocols using available lists of working phone number banks. Area samples for in-person interviews are often developed in the same way as well. Methods for selecting respondents from sampled households are likewise similar. While there is some variation in survey designs, a common framework for disposition coding and response rate calculation has emerged. (See for example AAPOR, 1998.)

Establishment surveys, however, often have as target populations many different industries, with different characteristics -- size of establishments, ownership and organizational structure, rates of births and deaths, extent of regulatory control, sensitivity to interactions with the firms' outside environment, etc. Sample designs and methods of survey administration may be somewhat more complex as well.

Therefore, the feasibility of obtaining agency agreement in creating a few standard rates might be limited by the following kinds of design issues:

- In two- or multiple-stage samples, survey managers might want to report data collection rates for each stage, and they might be more meaningful than an overall rate, even though an overall rate might be calculable. However, some surveys might not track response at one stage (initiation of the sampled first-stage unit into the survey, for example).

- Some survey programs currently emphasize weighted response rates that focus on the quantity of the attribute being reported (e.g., sales) rather than the cooperation of the establishment itself.

- Longitudinal surveys using panel samples can complicate standardization; this is also an issue in many personal and household surveys. Recommendations from groups studying household surveys typically have focused on the response rate for initiation into a survey, not on any follow on contacts (AAPOR, 1998 and Bates et al., 2000). But these contacts are quite important and should not be excluded.

An additional obstacle to overcome may be the political sensitivity of publishing response rates, particularly if no response rates have been published in the past. Organizational cultures within agencies may lead to opposition from survey managers to publication of response rates. Indeed, the reason that response rates may not have been published in the past may be because they would have been misleading. If this is so, explanatory notes for data users should accompany any new rates. Finally, some data users might be affected by changes in response rate calculation in ways that are not foreseeable – it would be useful to consider these possible implications prior to undertaking a full-scale standardization effort.

3.4. Conclusion

We have tried to outline the pros and cons of standardizing response rates and response rate calculations in Federal establishment surveys. Clearly, there are a number of advantages and

disadvantages that need to be weighed prior to the inception of standardization efforts. If efforts are expended to implement standards, the reasons why we are standardizing should be clearly delineated and duly considered. In addition, consideration should be extended to operationalizing what the response rates should be used for and identifying what significant obstacles need to be overcome if standardization efforts are to succeed.

4. HOW MIGHT STANDARDIZATION OF ESTABLISHMENT SURVEY RESPONSE RATES BE PURSUED?

Should federal agencies want to standardize establishment survey response rates, we propose a few steps that could be implemented to facilitate the likelihood of success at efforts to streamline the standardization process. These include:

- **Achievement of agreement on typical common definitions for dispositions or outcomes.** Some of the variations reported in response rates stem from a lack of agreement on what constitutes a "completed" or "usable" response, which contributes to the considerable variation found in disposition codes. It would be useful if survey managers within agencies, as well as across agencies, could agree upon what constitutes a "usable" or "completed" questionnaire.

  Similarly, the appropriateness of including ineligibles within the numerator of the response rate computational formulas needs to be considered. While most of the survey response rates described in this paper use only completed questionnaires in the numerators, a minority of surveys integrate other types of dispositions within the numerator. The teams described above could evaluate whether this practice should be continued. Clearly, there would be greater standardization if surveys only used completed questionnaires in the numerators for their calculation of response rate.

- **Agency publication of survey disposition codes and response rates:** Agencies could be encouraged to publish their disposition codes and return rates for more of their surveys. Increased visibility of published measures could result in the adoption of more commonly used rates across agencies. The adoption of more common practices to define disposition codes and response rates would be a significant step toward standardization.

- **Institution of within-agency teams:** Survey managers within agencies should develop teams that could examine how response rates are computed and reported for all agency surveys. Such a team would be able to identify areas of commonality and difference in disposition codes and response rates, and could evaluate the appropriateness of each code for both calculation and reporting purposes. These teams could collect input from agency staff, as well as external data users, to help determine whether standardization would be an appropriate course of action for the agency.

- **Initiation of a chartered inter-agency team:** At a hierarchically more complex level, survey managers from the major statistical reporting agencies could charter a team

similar to the agency-level team(s) for the purpose of reviewing definitions of response rates and reporting practices. This type of inter-agency group would be able to use the results from the within-agency teams to consider policy issues at the inter-agency level. The inter-agency team would need to set clear goals and objectives regarding: 1) how to evaluate agency-wide results; 2) how to aggregate and report data; 3) the utility of return rate comparisons across surveys and agencies; and, 4) what decision-making rules should be applied in addressing the question of standardization of establishment survey response rates across statistical agencies.

A coordinated effort would need to be undertaken at both the agency level and the across the governmental statistical agencies in order to achieve at least some measure of standardization of response rates. This effort would require design issues to be considered as well as survey-specific considerations in order to account for all of the factors likely to impinge on the calculation of response rates.

5. CONCLUSIONS

In a recent study, Shimizu (2000) found that there was significant variation in the calculation of response rates for government establishment surveys. These variations in operationalization were present in response rate calculations computed within agencies for internal use, as well as for "official" reporting and publication purposes. Among the most important findings were that some surveys use a weighted rate, in addition to an unweighted rate, and that different rates are calculated for different levels of stages in the data collection process. The main difference between rates in based upon the decision to include or exclude survey outcomes from the numerator and denominator of the rates.

The degree of variation in operationalization of response rates introduces the issue of whether it would be appropriate to have a greater degree of standardization among establishment survey response rates calculated in government agencies. This paper considers the viability of standardization and describes some steps that could be taken to implement a greater degree of standardization across establishment survey rates.

The advantages of standardization of response rates across government establishment surveys are readily apparent. First and foremost, there would be greater comparability across different surveys, which would improve the ability to monitoring individual establishments' participation across multiple surveys. This would be very helpful in evaluating and addressing the effects of survey burden and coordination of data collection efforts across different surveys. Survey managers and agency officials could more easily benchmark this aspect of performance, which could serve as a quality indicator against which to compare the performance of individual survey programs.

The issue of whether response rate measurement in government establishment surveys should be standardized is clearly becoming prescient in some government agencies and is not yet an important issue for some other agencies. Agencies currently evaluating the merits of response rate standardization (such as the BLS) are considering the viability of standardizing

establishment survey rates and have even developed groups to consider the question and the possible consequences of response rate standardization.

The most significant disadvantage of fostering standardization of response rates is likely to be as a result of variations in establishment survey populations and survey designs which make it difficult to identify one or a few "best" measures of response rate. In addition, these "best" measures may not be meaningful for many users of establishment response rate data. Other important issues that would be likely to impede the utility of the standardization process would be the significant time and effort required to convert survey practices and information systems to new disposition codes and rate calculations. Finally, the continuity of many time series of response rate data might be disrupted, which would have many consequences for the interpretation of obtained survey results.

This paper has considered the pros and cons of standardization of establishment survey response rates. Although the process of evaluating the appropriateness of standardization of response rates is currently underway in some government agencies, it is apparent that standardization of response rates might not be as feasible in establishment surveys as in household surveys. Certainly many roadblocks would need to be toppled in order for effective standardization guidelines to be identified and implemented in governmental establishment surveys.

6. REFERENCES

American Association for Public Opinion Research. (1998). *Standard Definitions: Final Dispositions for Case Codes and Outcome Rates for RDD Telephone Surveys and In-Person Household Surveys.* Ann Arbor, MI: AAPOR.

Bates, N., Doyle, P., & Winters, F. (2000). *Survey Nonresponse: New Definitions and Measurement Methods.* Paper presented at the Federal Committee on Statistical Methodology Statistical Policy Seminar, Bethesda, MD, November, 2000.

Interagency Group on Establishment Survey Nonresponse. (1998). *Establishment Nonresponse: Revisiting the Issues and Looking to the Future,* Statistical Policy Working Paper 28, Washington, DC: Office of Management and Budget, pp. 181-227.

Ramirez, C. (2000). *Report from the Interagency Group on Establishment Nonresponse.* Paper presented at the 2nd International Conference on Establishment Surveys, Buffalo, NY, June, 2000.

Shimizu, I. (2000). *Response in Federal Establishment Surveys.* Paper presented at the 2nd International Conference on Establishment Surveys, Buffalo, NY, June, 2000.

TABLE 2. Some Typically Calculated Rates and Selected Federal Establishment Surveys That Utilize Them

Rate	Formula [1]	Survey type[2]	Survey name/sponsor/conducted by	Use
UNWEIGHTED RATES: Unit rate calculations for assessing response levels				
Response type rate				
	S/(E+NU)	Census	Census of Jails /BJS/Census	Published
			Census of State and Local Law Enforcement Agencies / BJS / Census	Published
			State and Federal Adult Correctional Facility Census / BJS / Census	Published
	S/E	Cross-sectional (at most one data collection contact in year) - Single level	ASJ: Annual Survey of Jails / BJS/Census SSLEA: Sample Survey of Law Enforcement Agencies / BJS / Census CBECS1: Commercial Buildings Energy Consumption Survey /EIA CBECS2: Commercial Buildings Energy Consumption Survey /EIA	
		Cross-sectional - Level 1	NAMCS: National Ambulatory Medical Care Survey/NCHS/Census NHAMCS: National Hospital Ambulatory Medical Care Survey/ NCHS/Census (hospitals/departments) NHHCS: National Home and Hospice Care Survey /NCHS / Census NNHS: National Nursing Home Survey / NCHS / Census SASS: Schools and Staff Survey / NCES / Census	
		Cross-section- Level 2	NHAMCS: National Hospital Ambulatory Medical Care Survey/ NCHS/Census (Clinics/ESA) NHHCS: National Home and Hospice Care Survey /NCHS / Census NNHS: National Nursing Home Survey / NCHS / Census SASS: Schools and Staff Survey / NCES / Census	
		Longitudinal (more than one contact in year) -Single level	CES: Current Employment Statistics / BLS EIA-800, Weekly Refinery Report EIA-857: Monthly Report of Natural Gas Purchases and Deliveries to Consumers	

TABLE 2. Some Typically Calculated Rates and Selected Federal Establishment Surveys That Utilize Them

Rate	Formula [1]	Survey type[2]	Survey name/sponsor/conducted by	Use
	S/n	Longitudinal - Level 1	CFS: Commodity Flow Survey /BTS/ Census	
Receipt type rates				
	(S+OOB+OOS) / (n+NU)	Census	CJRP: Census of Juveniles in Residential Placement/ OJJDP / Census	Published
			JRFC: Juvenile Residential Facility Census / OJJDP/ Census	Published
	(S+OOB+OOS) / (n-UAA)	Census	Census of Agriculture / NASS	Internal tracking and Published
	(S+OOB+UAA) / (n+NU)	Census	Economic Census / Census	Sometimes published and used internally for management and monitoring; not intended to serve as a quality indicator
	(S+OOB+OOS+DUP) / (n+NU)	Cross sectional - Single level Level 1	AgSvy: Agricultural Survey / NASS	Internal tracking
			ARMS: Agricultural Resources Management Study /NASS	Internal tracking
	(S+OOB) / n	Cross sectional - Single level	ASM: Annual Survey of Manufactures/ Census	Sometimes published
			COS: Company Organization Survey/ Census	Sometimes published ; primarily used internally for managing and monitoring forms and receipts
Unit rates to assess success of data collection operations				
	S/n S(m)/n	Cross sectional	11 Services Sector Surveys / Census (Collection) (m denotes components of data collection operation such as, mode of data collection, trade area, establishment size, form number, etc.)	
Reporting	(S+D)/n	Longitudinal-Single level	CFS: Commodity Flow Survey /BTS /Census ("Rate 1" - % of mailed units providing response)	
Collection	S/(E-R)		CES: Current Employment Statistics /BLS (Collection - calculations exclude units	

Rate	Formula [1]	Survey type[2]	Survey name/sponsor/conducted by	Use
			which refused to be inducted into the survey at initiation.)	
Unit rates used for examining factors that reduce sample size				
Refusal	R/(n+NAT) R/(n-O)		ditto	
Out-of-scope	OOS/(n+NAT) OOS/(n-O)		ditto	
Out-of-business	OOB/(n+NAT) OOB/(n-O)		ditto	
Pending	O/(n+NAT)		ditto	
Unit rates used to monitor progress				
Receipt or Check-in	(S+D+OOB+ OOS)/n	Cross sectional - Single level	11 Services Sector Surveys / Census (produced by StEPS system)	
Delinquent	1-(Check-in rate)		ditto	
Extension	(O+R)/n		ditto	
Received	(S+D)/E		ditto	
Edit	EDIT/E		ditto	
Address refinement	AR/n	Longitudinal- Single level	CES: Current Employment Statistics /BLS (used in evaluating field representative performance)	
Completion	1- (O+NAT) / (n+NAT)		ditto	
Enrollment	Enrolled / (E-R)		CES: Current Employment Statistics /BLS	
Refusal	R/E		ditto	
Unit rates for other uses				
% responders with usable	S/(S+D)	Longitudinal- Single level	CFS: Commodity Flow Survey / BTS / Census	

Rate	Formula [1]	Survey type[2]	Survey name/sponsor/conducted by	Use
data				
WEIGHTED RATES: Unit rate calculations for assessing response levels				
Survey response type rate				
	$\frac{\sum_{S} w_i \quad t_i}{\sum_{E} w_i \quad t_i}$	Cross-sectional - Single level	11 Services Sector Surveys /Census	
	$\frac{\sum_{S} w_i}{\sum_{E} w_i}$	Cross-sectional - Levels 1 & 2	SASS: Schools and Staff Survey / NCES / Cen	
Initiation response rate	$\frac{\sum_{S} (QP_i / QA_i) w}{\sum_{E+NU+NAT} w_i \ t}$ where QP/QA is response rate for sample within establishment	Longitudinal - Level 1	PPI measures: Producer Price Index / BLS (Monthly initiation response rate - calculated for initiation wave only)	

Rate	Formula [1]	Survey type[2]	Survey name/sponsor/conducted by	Use
Other unit rates				
Imputation rate (for unit non-response)	$\frac{\sum_S (w_i' - w_i) y_i}{\sum_S w_i}$ where w' is non-response adjusted weight & y is value of interest	Cross sectional	11 Services Sector Surveys / Census (Calculated in StEPS system)	
Percent of frame total				
Represented by useable CFS responses	$\frac{\sum_S \frac{Q_i^R}{4} t_i w_i}{\sum_N t_i}$	Longitudinal-Single level	CFS: Commodity Flow Survey / BTS / Census (Weighted Rate 1) (Q_i = number of useable quarters of data provided by i-th establishment)	

Rate	Formula [1]	Survey type[2]	Survey name/sponsor/conducted by	Use
Represented by weighted usable CFS establishments	$\frac{\sum_{S} t_i \ w_i}{\sum_{N} t_i}$		(Weighted Rate 2)	
Selected to the sample	$\frac{\sum_{n} t_i}{\sum_{N} t_i}$		(Weighted Rate 3)	
In sample establishments with useable data	$\frac{\sum_{S} t_i}{\sum_{N} t_i}$		(Weighted Rate 4)	
To see how CFS estimates for useable sample compare to corresponding frame total	$\frac{\sum_{S} cfs_i}{\sum_{S} t_i}$		(Weighted Rate 5)	

[1] Unless otherwise defined in the table, definitions of disposition codes and weights used in response rate formulas can be found in Table 1

[2] Survey Type:

Census = includes entire known universe and collects data from each respondent at most one time per year (unless otherwise stated).

Cross-sectional = denotes sample survey which collects data from each respondent at most one time a year.

Longitudinal = denotes sample (unless otherwise stated) survey which collects data from each respondent multiple times a year.