August 25, 2003

Memorandum for: Chet Bowie, Chief
Demographic Surveys Division

From: Nancy Bates (Bureau of the Census) and
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Subject: WebCATI and AAPOR Response Rates

As you are likely aware, the Technologies Management Office (TMO) has designed a new Computer-Assisted Telephone Interviewing (CATI) system for demographic and economic surveys. The new system is called WebCATI and will replace the old CenCATI system previously used for telephone surveys. The American Community Survey (ACS) will be the first survey to migrate to WebCATI in March 2004, with the Telephone Point of Purchase Survey (TPOPS) shortly thereafter in May 2004.

The purpose of this memo is to document the outcome code parameters of the new WebCATI system and to recommend a strategy for producing response rates. Currently, the WebCATI outcome codes and outcome subtypes match back to the vast majority of final disposition codes for telephone surveys recommended by the American Association for Public Opinion Research (AAPOR). (See Attachment 1). However, the outcome code system was redesigned, with a primary goal of operational consistency and flexibility, to maximize the control and management of cases. The codes were designed from a production standpoint and for the purposes of scheduling and skills routing, not from the perspective of producing AAPOR equivalent response rates. While computing AAPOR rates is possible with WebCATI, considerable post-data collection editing is required.

Recently, one sponsor (the Bureau of Labor Statistics) expressed concerns about the difficulty of producing AAPOR rates from WebCATI. In this case (the TPOPS), DSMD agreed to perform the necessary post-data collection reprogramming to meet the sponsor requirements.

The Interagency Household Survey Nonresponse Group (IHSNG) has spent considerable effort standardizing response rates definitions for personal visit surveys. (See Atrostic et al. 2001.) The IHSNG and the Interagency Group on Establishment Nonresponse (IGEN) are in the process of documenting these rates for publication in an OMB statistical policy working paper. DSD already produces a core set of these recommended rates in a yearly updated memorandum. (See Bowie 2002a, 2002b, 1999, 1997).

To date, the IHSNG has not yet established common definitions for CATI surveys. However, AAPOR rates are fast becoming recognized as the industry standard for telephone surveys: Government agencies and private industry alike are routinely reporting them in methods reports, conference papers, journal articles, and the like.

To avoid problems with sponsors in the future and to adhere to industry standards, we have two recommendations. First, that the subject matter areas of DSD become familiar with the AAPOR telephone disposition codes and response rates formulas. Specifically, we recommend that DSD WebCATI surveys plan to routinely produce Response Rates II (RR2). (See Attachment 2). This will require additional programming staff on the part of DSD or DSMD, but it is to the Census Bureau's advantage, since the agency's performance review hinges, in part, on response rates. These are critical performance measures, and AAPOR rates will allow outsiders to validly compare rates across Census Bureau surveys, as well as benchmark those rates to the rates of external surveys.

Second, we request that you open discussion with TMO to explore the feasibility of adding a feature in the WebCATI system that would allow for real-time production of AAPOR rates in the future.

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References

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Table 1 - Final Disposition Codes for RDD Telephone Surveys*

1. Interview ..... (1.0)
    - Complete ..... (1.1)
    - Partial ..... (1.2)

2. Eligible, Non-Interview ..... (2.0)
    - Refusal and break-off ..... (2.10)
    - Refusal ..... (2.11)
    - Household-level refusal ..... (2.111)
    - Known respondent refusal ..... (2.112)
    - Break-off ..... (2.12)
    - Non-contact ..... (2.20)
    - Respondent never available ..... (2.21)
    - Telephone answering device (message confirms residential household) ..... (2.22)
    - Message left ..... (2.221)
    - No message left ..... (2.222)
    - Other ..... (2.30)
    - Dead ..... (2.31)
    - Physically or mentally unable/incompetent ..... (2.32)
    - Language ..... (2.33)
    - Household-level language problem ..... (2.331)
    - Respondent language problem ..... (2.332)
    - No interviewer available for needed language ..... (2.333)
    - Miscellaneous ..... (2.35)

3. Unknown Eligibility, Non-Interview ..... (3.0)
    - Unknown if housing unit ..... (3.10)
    - Not attempted or worked ..... (3.11)
    - Always busy ..... (3.12)
    - No answer ..... (3.13)
    - Telephone answering device (don't know if housing unit) ..... (3.14)
    - Telecommunication technological barriers, e.g. call-blocking ..... (3.15)
    - Technical phone problems ..... (3.16)
    - Housing unit, Unknown if eligible respondent ..... (3.20)
    - No screener completed ..... (3.21)
    - Other ..... (3.90)

4. Not Eligible ..... (4.0)
    - Out of sample ..... (4.10)
    - Fax/data line ..... (4.20)
    - Non-working/disconnected number ..... (4.30)
    - Non-working number ..... (4.31)
    - Disconnected number ..... (4.32)
    - Temporarily out of service ..... (4.33)
    - Special technological circumstances ..... (4.40)
    - Number changed ..... (4.41)
    - Cell phone ..... (4.42)
    - Call forwarding ..... (4.43)
    - Residence to residence ..... (4.431)
    - Nonresidence to residence ..... (4.432)
    - Pagers ..... (4.44)
    - Nonresidence ..... (4.50)
    - Business, government office, other organization ..... (4.51)
    - Institution ..... (4.52)
    - Group quarters ..... (4.53)
    - No eligible respondent ..... (4.70)
    - Quota filled ..... (4.80)

Calculating Outcome Rates from Final Disposition Distributions*

Numerous outcome rates are commonly cited in survey reports and in the research literature. The same names are used to describe fundamentally different rates and different names are sometimes applied to the same rates. As a result, survey researchers are rarely doing things in a comparable manner and frequently are not even speaking the same technical language. As Groves and Lyberg (1988) have noted, "(t)here are so many ways of calculating response rates that comparisons across surveys are fraught with misinterpretations." Among the more common terms utilized are response, cooperation, refusal, and contact.

As defined by CASRO (Frankel, 1983) and other sources (Groves, 1989; Hidiroglou, et al., 1993; Kviz, 1977; Lessler and Kalsbeek, 1992; Massey, 1995), the response rate is the number of complete interviews with reporting units divided by the number of eligible reporting units in the sample. Using the final disposition codes described above, several response rates are described below:

RR = Response rate
COOP = Cooperation rate
REF = Refusal rate
CON = Contact rate
I = Complete interview (1.1)
P = Partial interview (1.2)
R = Refusal and break-off (2.10)
NC = Non-contact (2.20)
O = Other (2.30)
UH = Unknown if household/occupied HU (3.10)
UO = Unknown, other (3.20)
e = Estimated proportion of cases of unknown eligibility that are eligible

Response Rates

$$\textbf{RR1} = \frac{I}{(I+P)+(R+NC+O)+(UH+UO)}$$

Response Rate 1 (RR1), or the minimum response rate, is the number of complete interviews divided by the number of interviews (complete plus partial) plus the number of non-interviews (refusal and break-off plus non-contacts plus others) plus all cases of unknown eligibility (unknown if housing unit, plus unknown, other).

$$\textbf{RR2} = \frac{(I+P)}{(I+P)+(R+NC+O)+(UH+UO)}$$

* The American Association for Public Opinion Research (*2000). Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys*. Lenexa, Kansas: AAPOR.

Response Rate 2 (RR2) counts partial interviews as respondents.

$$\textbf{RR3} \quad = \quad \frac{I}{(I+P)+(R+NC+O)+e(UH+UO)}$$

Response Rate 3 (RR3) estimates what proportion of cases of unknown eligibility are actually eligible. In estimating **e**, one must be guided by the best available scientific information on what share eligible cases make up among the unknown cases and one must not select a proportion in order to boost the response rate. The basis for the estimate must be explicitly stated and detailed. It may consist of separate estimates (Estimate 1, Estimate 2) for the subcomponents of unknowns (3.10 and 3.20) and/or a range of estimators based of differing procedures.[**] In each case, the basis of all estimates must be indicated.

$$\textbf{RR4} \quad = \quad \frac{(I+P)}{(I+P)+(R+NC+O)+e(UH+UO)}$$

Response Rate 4 (RR4) allocates cases of unknown eligibility as in RR3, but also includes partial interviews as respondents as in RR2.

$$\textbf{RR5} \quad = \quad \frac{I}{(I+P)+(R+NC+O)}$$

$$\textbf{RR6} \quad = \quad \frac{(I+P)}{(I+P)+(R+NC+O)}$$

Response Rate 5 (RR5) is either a special case of RR3 in that it assumes that e=0 (i.e. that there are no eligible cases among the cases of unknown eligibility) or the rare case in which there are no cases of unknown eligibility. Response Rate 6 (RR6) makes that same assumption and also includes partial interviews as respondents. RR5 and RR6 are only appropriate when it is valid to assume that none of the unknown cases are eligible ones, or when there are no unknown cases. RR6 represents the maximum response rate.

[**] One approach is to assume that the proportion of eligible and ineligible cases among the cases those eligibility status is known would also apply to the cases of indeterminate eligibility (Lessler and Kalsbeek, 1992, p. 115 and Hidiroglou, Drew, and Gray, 1993). Asecond approach uses special studies that follow-up the unknown cases to estimate eligibility status in similar studies (Groves and Lyberg, 1988; Massey, 1995; Shapiro, et al., 1995). Athird approach considers what is known about some or all of the individual cases and estimates eligibility on the basis of what is known from attempts to contact and interview them (Taylor, 1997).