

## ALTERNATIVE METHODS OF OBTAINING FAMILY INCOME IN RDD SURVEYS

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### Abstract

Income is often a key demographic variable in social science research. Because of the importance of this item, as well as the sensitivity of the question, the collection of income data merits particular attention. When the item is as analytically important as income, lower item nonresponse makes the data more useful. Item nonresponse is a concern in survey research since missing data limit the conclusions that can be made from the data. This paper addresses the implications of conversion from a series of precoded income questions, designed to narrow the income range, to an open-ended question requesting the exact amount preceding the series of precoded income questions. (The precoded series remained in the questionnaire as an alternative for those who would not or could not answer the exact-amount question, but the exact-amount question was asked first.)

### Introduction

The National Immunization Survey (NIS) is a random-digit-dialed survey designed to yield quarterly estimates of vaccination coverage for children in the target age range of 19-35 months in 78 Immunization Action Plan (IAP) areas which together make up the 50 states and include 28 metropolitan areas. Since 1994 the NIS has collected family income data using a series of precoded income questions.

As a result of increased interest in more-detailed income data, a question asking for the exact income has been added prior to the NIS series of precoded income questions. For the respondents who answer the exact-income question, the precoded income questions are not asked. For those who do not provide an exact income, the series of precoded income questions is asked. Three groups will be compared: 1) respondents who provide an exact income; 2) respondents who do not provide an exact income, but do answer the series of precoded income questions; and 3) respondents who neither provide an exact income nor answer the series of precoded income questions. Data from these two versions of income questions will be analyzed with respect to item nonresponse (don't know and refusal answers, as well as breakoffs) and the resulting income distributions.

An intriguing outcome of adding the exact-income question to the NIS is that the income item nonresponse rate decreased. When the only response option was the precoded income question, 83% of respondents answered; but when the exact-income question was the first response option and the series of precoded income questions was the second response option, then 68% of the respondents provided their exact income, and 18% answered the precoded question, for a total of 86% of respondents providing income data.

Income is often a key demographic variable in social science research. Because of the importance of this item, as well as the sensitivity of the question, the collection of income data merits particular attention. When the item is as analytically important as income, lower item nonresponse makes the data more useful. Item nonresponse is a concern in survey research because missing data limit the conclusions that can be made from the data. This paper addresses the implications of conversion from a precoded series of income questions, designed to narrow the income range, to an open-ended question (preceding the precoded income questions) that requests the exact amount.

### Previous Research

Income data are notoriously difficult to obtain. Many respondents consider the topic a sensitive and personal question. The University of Chicago's landmark national survey of sexual behavior included a number of questions that were so sensitive they had to be placed in a special, self-administered component of the questionnaire, rather than asked by an interviewer face-to-face. Most of these questions were about the respondent's sexual practices, but one of them was the item on total family income—which many respondents said was the most sensitive and personal question in the entire survey (Laumann, Gagnon, Michael, and Michaels, 1994). Another important study asked a national sample of adults how uneasy it would make someone to be asked his or her income; 12.5% said very uneasy, and only a third (32.7%) said not at all uneasy (Bradburn and Sudman, 1979).

Even when respondents are willing to disclose their total family income, they may not know what it is, or they may be frustrated by the effort required to come up with the information. Moore et al. (1999) cite a number of conceptual and cognitive issues involved in

reporting total family income, ranging from definitional differences to recall problems.

Given the sensitive and difficult nature of the family income question, Sudman and Bradburn (1982) have suggested the use of income ranges, even though they give a less precise measure than simply asking for an exact amount: "Since people are often reluctant to report total family income (and often simply do not know the total), it has been found that providing the respondent with income ranges . . . is a satisfactory way of recording income information. While using income ranges does lose some information, respondents appear to be more willing to place themselves in a broad category of incomes than they are to report specific amounts."

The experience of other researchers supports this assertion. In a telephone study that examined demographic characteristics associated with propensity not to answer income questions, Bell (1984) offered respondents essentially the same choices that have been used in the National Immunization Survey. First, the interviewer asked respondents an exact-income question ("How much money did you earn from working during the past year?"). If the respondent did not know, or refused to answer, the interviewer asked an income-range question (" . . . under \$3,000, \$3,000 to \$5,999 . . ."). Bell found that 26% of respondents failed to answer the exact-income question; but of those 26%, only 13% failed to answer the income range question. Although this is not a split-sample design, making a precise comparison between the exact-income question and the range question impossible, it does appear that the respondents in Bell's study were more inclined to respond to the range question than they were to the exact-amount question. Out of the total sample of 3,816, there were 1,019 respondents who did not answer the exact-amount question. But whereas only 133 of those nonrespondents to the exact-income question *also* did not respond to the range question, the remaining 886 *did* respond to the range question. This would tend to suggest that one way to reduce item nonresponse for income data is to offer respondents a range rather than asking them for anything more specific—even though, as Sudman and Bradburn pointed out, this loses detailed information.

Policymakers increasingly need more-detailed income data rather than less-detailed income data, and this need prompted the National Immunization Survey to add an exact-amount income question to its questionnaire, with somewhat surprising results.

## Data

Since 1994 the NIS has collected family income data using a series of precoded income questions. In the interest of obtaining more-detailed income data, the NIS

recently added a question asking the exact income of the family, which appears in the questionnaire just before the precoded income questions.<sup>1</sup> For those who do not provide an exact income for the last calendar year, the precoded income questions are still asked. For those who do answer the exact-income question, the precoded income questions are skipped.

This change was made at the beginning of the second quarter of the 1998 data collection (called "Q2/98" in NIS nomenclature and in this paper). The analysis below compares data from the two quarters preceding this quarter with data from the first two quarters incorporating this questionnaire revision.

## Analysis

First, the new exact-income question reduced item nonresponse (Table 1). During the six months (two quarters) prior to the addition of this question, the income item nonresponse rate was 17.1% (9.9% don't know and 7.1% refused). After the addition of the exact-income question, the income item nonresponse rate fell to 13.8% (9.2% don't know and 4.6% refused). Of those surveyed, 68.0% provided an exact income, and an additional 18.2% completed the precoded income questions. Thus, the addition of the exact-income question increased the overall number of cases with income data, and moreover, 78.9% of the 86.1% of the respondents who provided income data gave an exact amount. This suggests that it may not be necessary to default to asking about this key continuous variable by using questions that obtain merely categorical data. There are a number of possible explanations for the overall increase in responses to the income questions. For example, one explanation might be that hearing the exact-income question prompted the respondent who was unable or unwilling to answer it to compromise with the interviewer, by answering the less demanding precoded income questions that immediately followed.

It is also significant that the inclusion of this

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<sup>1</sup>The wording of the new question is, "Please think about your total combined family income during (LAST CALENDAR YEAR) for all members of the family. Include money from jobs, Social Security, retirement income, unemployment payments, public assistance, and so forth. Also include income from interest, dividends, net income from business, farm, or rent, and any other money income received. Can you tell me that amount before taxes?" If this exact income question is not answered, the precoded income questions are asked beginning with "You may not be able to give us an exact figure for your total combined family income, but was your total family income during (LAST CALENDAR YEAR) more or less than \$20,000?"

more-demanding exact-income question did not affect the percentage of respondents who discontinued the interview at the income section. Respondents who balked at the exact-income question typically either responded that they would refuse to answer the question or else gave a don't know response, but they did not end the interview. The same pattern appears with the precoded income series: once it is begun, a respondent is very unlikely to break off the interview.

What impact does the change from a series of precoded income questions to an exact-income question have on the income distribution for those responding? Table 2 shows that the addition of the exact-income question in Q2/98 resulted in a higher percentage of cases in the lower income categories than did the precoded income question series, which was used alone in Q1/98. With the addition of the exact-income question to the precoded income questions, the overall distribution has a higher percentage of responses in the lower income categories.

How do the responses of the respondents who answer the two types of income questions differ? Table 3 compares income responses, grouped into the same categories that were used for the precoded series, for two groups: those who answered the exact-income question and the respondents who answered the precoded series. For completeness, it includes the combined distribution. This comparison shows that including the precoded income questions following the exact-income question results in not only a reduction in the don't know and refusal responses, but also an income distribution that reflects a higher percentage of respondents in the lower income categories. This suggests that exact income information may be more difficult for lower-income respondents to provide and that being able to supply the information in a choice of two formats eases the interview burden for these respondents.

Table 4 presents the categorical income data (from the precoded income questions) for the respondents who answered don't know to the exact-income question, or refused to answer it (combining Q2/98 and Q3/98). This table shows that a third of the respondents who gave a don't know or refusal answer to the exact-income question gave the same response to the precoded income questions (34.3% and 35.6%, respectively). To some extent, the don't know and refusal responses appear to be interchangeable: 6.7% of the respondents who gave a don't know response to the exact-income question then refused to answer the precoded income questions, and 13.5% of the respondents who refused to answer the exact-income question gave a don't know response to the precoded income questions. The precoded income questions elicited a response from a higher percentage of

the respondents who originally gave a don't know response (59.0%) than from those who refused the exact-income question (51.0%). This suggests that the precoded questions, rather than playing the role of convincing reluctant respondents to disclose their income, are helpful for the respondents who are unable to answer the exact-income question.

Those who answer the precoded income questions after not having answered the exact-income question tend to have lower incomes, suggesting that the exact-income question is more difficult for these respondents. This might be due to a variety of factors, such as their employment income perhaps being on an hourly rather than salaried basis (and perhaps a variable work week). The pattern of response to the exact-income question may provide some insight into why the don't know responses are more prevalent among the lower-income respondents. Among respondents reporting an exact income below the median reported income, 87.7% provided an income that was a multiple of \$1,000, whereas among those who gave an income above the median reported income, 99.7% reported an income that was a multiple of \$1,000. Respondents who have a lower income may be trying to be more precise regarding the income they report, thus making it more difficult for them to provide an exact income. This may account, partially, for the higher percentage of don't know rather than refusal responses among these survey participants.

## Conclusion

There is increasing demand for precise income data in population-based surveys, especially surveys where the behavior and experience of lower-income groups are of particular policy interest. However, previous research has suggested that exact-income questions are problematic: even more sensitive than range questions, and therefore likely to result in high levels of item nonresponse. In light of the experience of other researchers, it is somewhat surprising and indeed encouraging that by adding the exact-income question to the NIS we actually reduced the income item nonresponse rate. It is also encouraging that by adding the exact-income question we obtained more responses on income from lower-income sample members than we were able to obtain without it—and that the lower-income members of the sample were more inclined to provide exact data than just a range. All in all, our experience suggests that exact-income questions, when they are asked appropriately and in the right context, can be surprisingly helpful in eliciting policy-relevant income data, despite the threat, cognitive issues, and overall response burden they might pose.

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**Table 1. Comparison of Responses to Income Questions, Prior to and After Addition of Exact-income Question**

	<b>Precoded Categorical Income Questions (Q4/97-Q1/98)</b>	<b>Exact-income Question (Q2/98-Q3/98)</b>	<b>Both Exact and Categorical Income Questions (Q2/98-Q3/98)</b>
Exact Income	N/A	67.99	67.99
Precoded Income	82.95	N/A	18.15
Don't Know	9.93	23.35	9.20
Refused	7.12	8.66	4.66
Total	100.0%	100.0%	100.0%
Number of Respondents	15,994	16,229	16,229

**Table 2. Comparison of Income Responses in Q1/98 Using Only Precoded Income Question Series with Responses in Q2/98 Using Exact-income Question Followed by Precoded Income Questions**

	<b>Precoded Income Questions Only (Q1/98)</b>	<b>Exact-income Question Only (Q2/98)</b>	<b>Exact and Precoded Income Questions Combined (Q2/98)</b>
\$7,500 or less	4.84	6.52	7.22
\$7,501 to \$10,000	6.92	3.80	6.45
\$10,001 to \$12,500	2.15	3.01	3.19
\$12,501 to \$15,000	3.91	5.20	5.26
\$15,001 to \$17,500	2.90	2.26	2.41
\$17,501 to \$20,000	5.61	5.99	6.58
\$20,001 to \$30,000	15.38	17.68	16.54
\$30,001 to \$50,000	24.88	25.25	22.73
\$50,001 to \$75,000	18.66	16.96	16.38
More than \$75,000	14.73	13.35	13.24
Total	100.0%	100.0%	100.0%
N	6591	5580	7147

**Table 3. Comparison of Income Distribution: Respondents Who Provide an Exact Income, Respondents Who Provide a Response to the Precoded Question Series, and the Two Groups of Respondents Combined (Q2/98)**

	<b>Exact-income Question Only</b>	<b>Precoded Income Question Series</b>	<b>Total</b>
\$7,500 or less	6.52	9.70	7.22
\$7,501 to \$10,000	3.80	15.89	6.45
\$10,001 to \$12,500	3.01	3.83	3.19
\$12,501 to \$15,000	5.20	5.49	5.26
\$15,001 to \$17,500	2.26	2.94	2.41
\$17,501 to \$20,000	5.99	8.68	6.58
\$20,001 to \$25,000	8.41	3.51	7.33
\$25,001 to \$30,000	9.27	9.00	9.21
\$30,001 to \$35,000	5.77	2.04	4.95
\$35,001 to \$40,000	7.28	6.32	7.07
\$40,001 to \$45,000	4.57	1.53	3.90
\$45,001 to \$50,000	7.63	3.89	6.81
\$50,001 to \$60,000	8.57	7.40	8.31
\$60,001 to \$75,000	8.39	6.96	8.07
More than \$75,000	13.35	12.80	13.24
Total	100.0%	100.0%	100.0%
N	5580	1567	7147

**Table 4. Comparison of Categorical Income by Response to Exact-income Question (Q2/98 and Q3/98)**

	<b>Exact Amount Given (Grouped into categories)</b>	<b>Don't Know (categorical response)</b>	<b>Refused (categorical response)</b>	<b>Total</b>
\$7,500 or less	4.66	7.39	1.35	6.50
\$7,501 to \$10,000	2.51	12.14	2.20	5.54
\$10,001 to \$12,500	2.11	2.35	0.85	2.74
\$12,501 to \$15,000	3.40	3.54	1.42	4.35
\$15,001 to \$17,500	1.58	2.38	1.00	2.22
\$17,501 to \$20,000	3.73	5.70	1.99	5.23
\$20,001 to \$25,000	5.56	2.11	1.42	6.17
\$25,001 to \$30,000	6.17	5.44	3.56	7.75
\$30,001 to \$35,000	4.04	1.48	1.42	4.50
\$35,001 to \$40,000	5.12	3.64	3.84	6.30
\$40,001 to \$45,000	3.06	0.63	1.28	3.32
\$45,001 to \$50,000	4.98	1.72	3.84	5.72
\$50,001 to \$60,000	5.74	3.14	6.40	7.03
\$60,001 to \$75,000	6.06	2.61	7.11	7.29
More than \$75,000	9.26	4.59	13.16	11.47
Don't Know	23.35	34.39	13.51	9.20
Refused	8.66	6.76	35.63	4.66
Total	100.0%	100.0%	100.0%	100.0%
N	16,229	3,789	1,406	16,229