

FAMILY INCOME NONRESPONSE IN THE NATIONAL HEALTH INTERVIEW SURVEY (NHIS): 1997-2000

John R. Pleis and James M. Dahlhamer

National Center for Health Statistics, 3311 Toledo Road, Hyattsville, Maryland 20782

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Introduction

Income nonresponse remains a pressing problem for federal government surveys. Citing figures from the 1996 Current Population Survey (CPS), Moore et al. (2000) report income item nonresponse rates ranging from 20 to nearly 50 percent, with questions on asset income the most problematic. Similar rates are reported for the 2001 Survey of Income and Program Participation (SIPP), with a low of 20% for supplemental security income and a high of 50% for income amounts received via retirement, survivor, or disability pensions (Item Quality Group, 2003). Questions on annual total family or household income elicit similar levels of nonresponse. For example, in 2001 the National Crime Victimization Survey and the Consumer Expenditure Quarterly Survey reported nonresponse rates of 21% and 23% respectively (Item Quality Group, 2003).

The National Health Interview Survey (NHIS)¹ is not immune to the problems of collecting income data. An exact amount question on annual total family income² elicited “don’t know” or refusal responses from approximately 25% of persons interviewed in 1997. This rose to 28% in 1998, 31% in 1999, and 32% in 2000.³ Follow-up questions intended to capture an approximate income amount have done little to improve response, decreasing overall income nonresponse by only four percentage points in 1997, with similar decreases in 1998, 1999, and 2000.

Since annual family income is an important measure of socioeconomic status and is strongly related to

health-related measures and outcomes such as health status, health insurance coverage, and access to health care, many analyses employing NHIS data will involve income. However, the loss of 25% or more of cases due to missing values poses problems for analyses, including a loss of precision in estimates and the introduction of bias if respondents differ from nonrespondents. This could have adverse effects on analytic results and limit generalizability.

The extent of bias and the ability to address it are partially a function of the nonresponse pattern (Little and Rubin, 1987). If the probability of response is independent of the variable of interest (income) and other observed items, then nonresponse would be considered to be missing completely at random (MCAR). A missing at random (MAR) assumption would hold if the probability of response is dependent on observed items other than income. With some exceptions, MCAR and MAR are generally considered ignorable nonresponse, and adjustment approaches, such as imputation, are straightforward. However, if the probability of response is related to income or other relevant unobserved measures, nonresponse would be nonignorable, or not missing at random (NMAR). In this case, adjustment procedures are limited and more complex (Little and Rubin, 1987).

Taking the above into consideration, the primary goal of this paper is to more fully explore family income nonresponse in the NHIS using data from 1997-2000. A model of income nonresponse is developed and tested using logistic regression techniques, and findings from analyses on overall income nonresponse and type of nonresponse (refusals versus “don’t know” responses) are presented. The results provide an initial assessment of potential bias introduced by nonresponse on total family income, information for the development of adjustment methods, and insights into the impact of possible design changes.

Sources and Types of Income Nonresponse

There has been considerable discussion on the probable causes of income nonresponse. One problem stems from the private or personal nature, as well as importance, of income information, resulting in heightened sensitivity (Moore et al., 2000).

¹ Covering the civilian, noninstitutionalized population of the United States, the NHIS is a face-to-face (in-house), multi-purpose health survey administered annually by the National Center for Health Statistics, Centers for Disease Control and Prevention. For more information, please visit the NHIS Web site at www.cdc.gov/nchs/nhis.htm.

² The question reads as follows: “Now I am going to ask about the total combined income {for you/of your family} in {previous calendar year}, including income from all sources we have just talked about such as wages, salaries, Social Security or retirement benefits, help from relatives and so forth. Can you tell me that amount before taxes?”

³ These numbers are weighted and apply to family respondents (aged 18+). With respect to income questions, a family respondent responds for all family members. Unweighted rates are 24.9% (1997), 29.0% (1998), 31.0% (1999), and 31.5% (2000).

Income is a major component in defining one's social class or position. Low income respondents may feel that this information will reflect poorly on them, while higher-income participants may have concerns about envy, resentment, or embarrassment. People may also be unwilling to discuss the topic because their true income differs from declarations on official documents, a potentially greater problem for government surveys due to fear of reprisals. Further, respondents do not always know the requested information, either because they are not privy to it or because the exact details are not readily accessible (Moore et al., 2000; Smith, 1991). If a single individual controls household finances, for example, other household members may be unable to provide the necessary data. Finally, income has many varied components, including multiple recipients, periods of receipt, and forms of remuneration. Thus it is difficult to construct survey questions in clear, simple, and easily understood terms. The comprehension of income concepts and terms may be a difficult task for respondents (Moore et al., 2000), leading to problems in responding.

As suggested above, family income nonresponse in the NHIS may be triggered by sensitivity concerns, comprehension problems, and/or lack of knowledge or access to information. Since these cognitive barriers may operate separately and differentially on one's ability or willingness to answer income-related questions, we would expect variation in type of nonresponse (e.g., refused and "don't know") by respondent and other characteristics. While most studies of item nonresponse, including income nonresponse, combine refusal and "don't know" responses (Shoemaker et al., 2002), some analyses have identified different correlates by type (Owens et al., 2001; Riphahn and Serfling, 2002; Schrapler, 2003). Schrapler (2003), for example, found that respondents who refused to answer income questions were typically male with no dependent children residing in the household. In contrast, "don't know" respondents tended to be female, employed in low-status positions, and holders of irregular work schedules. Combining different types of missing responses may lead to ambiguous conclusions and erroneous solutions for nonresponse reduction (Schrapler, 2003).

Schrapler's suggestions concerning item level nonresponse are consistent with research separating noncontacts and refusals when examining unit and survey nonresponse (Groves and Couper, 1998). This research posits that different types of nonresponse contribute individually to the overall nonresponse error, and final nonresponse error is a function of the balance between types such as noncontacts ("don't knows") and refusals. Whether the focus is at the unit or item level, survey/item design changes may impact the balance of nonresponse types and affect bias in a nontrivial fashion. For example, there may be no effect of education on overall income nonresponse, but there may be significant variation by

type: highly educated persons may be more likely to refuse, and there may be a greater likelihood of "don't know" responses among less educated persons. The inclusion of follow-up bracketing questions may convert greater numbers of "don't know" responses (Juster and Smith, 1997), disproportionately adding lower incomes to the distribution, but may have no impact on refusals.

If refusals and "don't knows" are functionally equivalent, as often implied in the literature (Shoemaker et al., 2002), we would expect similar rates and parallel changes over time for the NHIS total family income question. However, a comparison of the rates does not support this hypothesis. The "don't know" rate was 9.1% in 1997, 10.7% in 1998, 10.9% in 1999, and 10.5% in 2000.⁴ Thus, the "don't know" rate has been relatively stable over the four-year period. In contrast, the refusal rate was 15.5% in 1997, 17.8% in 1998, 19.6% in 1999, and 21.3% in 2000. The refusal rate is higher than the "don't know" rate and largely responsible for the continual rise in overall income nonresponse. Understanding income nonresponse in the NHIS, and the implications for nonresponse adjustment and reduction strategies, requires examining the correlates of refusal and "don't know" responses.

Modeling Income Nonresponse

We develop a model of income nonresponse that draws on prior research in this area. Consistent with work on item nonresponse as a whole, research on income nonresponse focuses heavily on respondent characteristics such as age, education, sex, employment status,⁵ marital status, and race and ethnicity. When looking at age and overall nonresponse,⁶ the preponderance of evidence suggests a direct, positive association, whereby older respondents show a greater reluctance or inability to share income information (Bell, 1984; Owens et al., 2001; Riphahn and Serfling, 2002; Ross and Reynolds, 1996; Smith, 1991; Turrell, 2000). There is, however, variation by type of nonresponse. For example, Schrapler (2003) reports a positive association of age with refusing, but a negative effect

⁴ These are weighted rates for family respondents. The unweighted don't know rates are 9.4% (1997), 11.4% (1998), 11.8% (1999), and 11.0% (2000). The unweighted refusal rates are 15.5% (1997), 17.7% (1998), 19.2% (1999), and 20.6% (2000).

⁵ Occupation has been extensively explored, but is not included in our model since occupational data were not available for all family respondents.

⁶ "Overall" or "total" income nonresponse refers to analyses where no distinction was made between "don't know" and "refused".

on “don’t know” responses. Owens et al. (2001) report higher odds of refusing and lower odds of not knowing among middle-aged persons compared with younger respondents.

Research results concerning the effects of other respondent characteristics are less consistent. For example, previous studies have reported no effect of education on total income nonresponse (Ross and Reynolds, 1996), a positive effect (Riphahn and Serfling, 2002; Turrell, 2000), and a negative effect (Bell, 1984; Owens et al., 2001; Smith, 1991). Riphahn and Serfling (2002) identified a negative association with the likelihood of refusing, while Owens et al. (2001) revealed higher refusal and lower “don’t know” rates among the highly educated and poorly educated persons, respectively. Similar trends emerge for sex. While females have been characterized by greater income nonresponse (Bell, 1984; Smith, 1991), other studies failed to uncover an association (Kormendi, 1988; Ross and Reynolds, 1996; Turrell, 2000), or reported contradictory effects. For example, Owens et al. (2001) found that both men and women, depending on the data source, produce more overall missing data, a pattern also revealed in separate analyses of “don’t know” and refusal responses (Owens et al., 2001; Schrapler, 2003).

Evidence is also mixed for the effects of marital status, employment, race, and ethnicity on income nonresponse. Some studies have shown the “currently employed” to be less forthcoming with income information (Kormendi, 1988; Smith, 1991; Turrell, 2000), while others found a significant, positive association for unemployed and part-time employees (Riphahn and Serfling, 2002). Similarly, analyses have found no effects of marital status (Bell, 1984), less missing data among the married (Ross and Reynolds, 1996), and both lower and higher overall income nonresponse for single, separated, and divorced respondents (Owens et al., 2001). Analyses by type have revealed a greater likelihood of not knowing income amounts among single respondents, while married persons appear to refuse at higher rates than single, widowed, and separated/divorced individuals (Owens et al., 2001). Analyses involving measures of race and ethnicity have found no effect on overall income nonresponse (Smith, 1991), greater nonresponse among African Americans (Owens et al., 2001; Ross and Reynolds, 1996) and whites (Bell, 1984), and less nonresponse among Hispanics (Owens et al., 2001). In multi-survey comparisons, African Americans had higher or lower odds of refusing compared to whites, a pattern also characterizing African American and Hispanic participants in analyses of “don’t know” responses (Owens et al., 2001).

Although few studies investigated influences at the family, household, and social environmental levels, researchers have reported that larger families or greater

numbers of adults/wage earners increase overall nonresponse (Ross and Reynolds, 1996; Smith, 1991), while the presence of children reduces refusal responses (Schrapler, 2003). Other findings include increased nonresponse among home owners (Souza-Posa and Henneberger, 2000), variation in reporting total income by a household’s primary source of income (Turrell, 2000), and lower nonresponse on home values and home loan amounts among respondents in smaller communities (Riphahn and Serfling, 2002).

In sum, the literature suggests a number of correlates of income nonresponse, including respondent, family/household, and geographic level measures. A primary theme, however, is the inconsistency of findings, possibly reflecting differences in sample sizes, target populations, survey content, modes of data collection, and analytical sophistication. In this study we posit that inconsistencies may stem from the often generic treatment of income nonresponse. To address this, we conduct separate analyses of overall nonresponse and refusal versus “don’t know” responses, employing a model (see Table 1) consistent with the existing literature. We extend the literature by including measures such as U.S. versus foreign born, single versus multiple family households, urban/rural residency, region of country, and metropolitan statistical area (MSA) status.

Methods

Data used in this study were obtained from the 1997 – 2000 NHIS, a complex, multistage household health survey designed to provide estimates for the U.S. civilian, noninstitutionalized household population. A family respondent provided the NHIS information used in this study. While family respondents may provide proxy reports for other family members, all of the information about the family respondent is self-reported. All family respondents less than 18 years of age were excluded from the analysis ($n = 299$). The family respondent response rate over the four year study period was 88.0%.

Since we were interested in exploring the relationship between respondent characteristics and income nonresponse, and in learning if any association patterns are different when nonresponse is examined by type, two separate multiple logistic regression analyses were performed. The first analysis, which only included respondents who did not provide an income amount, was used to determine if various family respondent characteristics differed by the type of nonresponse ($n = 44,745$). The second analysis, which included all family respondents, did not make a distinction between the

two types of nonresponse ($n = 155,323$). The variables included in each model were the socio-demographic characteristics of family respondents, household and family-level measures, geographic measures, and different types of income sources. Specific information regarding the variables utilized is shown in Table 1. Also, variables representing the year of the study were added to the logistic regression models to control for a possible year effect. We also recognized the possibility that certain levels of education may not have been attainable at the time of the interview, due to the respondent's age. When the logistic regression analyses were refitted for only respondents greater than or equal to 25 years of age, the results were similar to the results for respondents at least 18 years of age. Thus, only the results for respondents greater than or equal to 18 years of age are shown.

Results, which were weighted to be representative of the U.S. civilian, noninstitutionalized population, are presented as odds ratios (ORs). Due to the relatively large sample sizes, the level for detecting statistical significance was chosen to be $\alpha = 0.01$, and 99% confidence intervals (CIs) are presented. Also, since a large sample size can provide statistically significant results when an odds ratio is close to 1.00, we will primarily focus on results for which the odds ratio is significantly different and farther from 1.00. Models were checked for influential points. All analyses were performed using SUDAAN (Version 8.0, Research Triangle Institute, Inc., Research Triangle Park, NC), which accounts for the complex sample design of the NHIS.

Results

The results from the logistic regression analyses are shown in Table 1. Analysis of model fit, by the method suggested by Korn and Graubard (1999), did not indicate lack of fit for either the model comparing refusals to "don't knows" ($\chi^2 = 11.69$, $p = 0.04$) or the model comparing overall nonresponse to known income values ($\chi^2 = 4.79$, $p = 0.44$).

Looking at family respondent characteristics, respondents not providing an income amount who were 18 – 24 years of age had considerably lower odds of giving a refusal as opposed to a "don't know" response than respondents who were at least 75 years of age. Additionally, respondents 18 – 24 years of age (reference group) had substantially lower odds of providing a refusal⁷ compared with respondents 25 – 54 years of age (OR = 2.14, 99% CI = (2.00, 2.29)),⁸ 55 – 64 years of age (OR = 2.21, 99% CI = (2.21, 2.56)),⁸ and 65 – 74 years of age (OR = 2.68, 99% CI = (2.41, 2.93)).⁸ In addition, respondents who were aged 18 – 24 and 25 – 54 had

substantially lower odds of not providing any income information, compared with respondents who were at least 75 years of age.

While statistically significant associations between total income nonresponse and education (except for those with at least a bachelor's degree) were present, the magnitude of these associations was relatively small. There was a considerable association between education and the type of nonresponse. For example, respondents with a high school diploma (not including those with a GED) had odds of refusing 53% higher than respondents with less than a high school education. There was not a substantial difference in the odds of refusing when comparing respondents with a GED to those with less than a high school diploma, although the results were statistically significant. Respondents with some form of college education had substantially higher odds of refusing than respondents with less than a high school diploma. Respondents with at least a bachelor's degree had odds of refusing that were noticeably higher than those for respondents with a high school diploma (OR = 1.59, 99% CI = (1.36, 1.88))⁸ or a GED (OR = 1.79, 99% CI = (1.40, 2.27)).⁸ Aside from those respondents who had at least a bachelor's degree, there was not an appreciable difference in the odds of refusing when comparing respondents with some form of a college education to those respondents who had either a high school diploma⁸ or a GED⁸. Further, there was not a substantial difference in the odds of refusing when comparing the levels of college education (some college, AA degree, at least a bachelor's degree).⁸

Married respondents had odds of refusing that were 78% higher than those for never married respondents, but married respondents had lower odds of not providing a total income amount when compared with respondents who had never married. Additionally, married respondents had odds of refusing that were at least 71% higher than those for widowed (OR = 1.84, 99% CI = (1.53, 2.20))⁸, separated (OR = 1.85, 99% CI = (1.49, 2.36))⁸, or cohabiting (OR = 1.71, 99% CI = (1.36, 2.16))⁸ participants, although there were no noticeable differences between these groups in the total nonresponse analysis. Comparing married respondents to divorced respondents, there were statistically significant differences in the type of nonresponse (OR = 1.36, 99% CI = (1.14, 1.63))⁸ and total income nonresponse (OR = 0.80, 99% CI = (0.72, 0.90)),⁸ although the magnitude of these associations is relatively modest.

Among respondents who did not provide an income amount, those who were currently employed

⁷ Implies "odds of a refusal opposed to a 'don't know' response". This applies throughout the Results section.

⁸ Additional odds ratio not shown in Table 1.

(at the time of the interview) had odds of refusing 80% higher than respondents who were not currently employed. While the association between employment within the previous calendar year and the specific type of nonresponse was statistically significant, the magnitude of the association was relatively small. Further, there was no significant association between current employment status and total income nonresponse. Also, we found that while there were statistically significant associations with sex, race, and ethnicity in both analyses, the magnitude of the ORs was relatively modest.

Turning to the family and household level measures, there was a substantial association with multiple family households and total nonresponse as well as the specific type of nonresponse. Respondents in multiple family households had lower odds of not providing a total income amount. Among those who did not provide an income amount, respondents living in a multiple family household had lower odds of providing a refusal. There was a considerable association with the number of adults in the family and total nonresponse, as well as the specific type of nonresponse. Respondents in single adult families (the respondent was the only adult) had odds of refusing that were 57% higher than respondents in families with two adults ($OR = 1.57$, 99% $CI = (1.35, 1.82)$),⁸ and respondents in families with two adults had odds of refusing that were 52% higher than respondents in families with three or more adults. In each analysis, there were statistically significant associations with housing tenure, the presence of children in the family, and the various geographic measures. However, the magnitude of these associations was relatively modest.

There were some appreciable associations when the income source type is considered. Family respondents from families who received interest/dividend income had lower odds of not providing an income amount. Also, family respondents from families who received child support/other income or food stamps had lower odds of providing a refusal as opposed to a “don’t know” response.

Discussion

The primary goal of this paper was to analyze differences in various family respondent characteristics by type of nonresponse since most previously published work on income nonresponse has focused on total nonresponse. These results presented here may have implications for questionnaire design and data analysis, including imputation. For example, nonrespondents to the initial family income question could be asked a series of follow-up questions utilizing income brackets. Previous research suggests that a bracketing technique may convert more initial “don’t know” responses than initial refusals. Juster and Smith (1997) analyzed the use of bracketed follow-up questions in the gathering of dollar values of asset holdings. The results indicated that

refusals tend to be concentrated in the upper end of the value distribution, and “don’t know” responses are mainly concentrated in the lower end. It seems plausible that these findings can be extended to the gathering of income data since both income and assets are major components of defining one’s social class or position, and surveys that gather such information have similar amounts of non-response. If the income distributions for refusals and “don’t know” responses are dissimilar, the entry points for the follow-up bracketing questions may be different for nonresponse type. For example, a follow-up initial bracket that asks the respondent if the family’s income is more than \$20,000 per year may not provide much improvement for those families at the high end of the income distribution (i.e., refusals) but could provide greater data usability for those at the low end of the income distribution (i.e., “don’t know” responses).

This work also highlights concerns that should be addressed when handling income nonresponse in data analysis (in particular, imputation). Due to the differences between the types of nonresponse and also the large amount of income nonresponse that surveys such as the NHIS typically have, an analyst may wish to use the differentials in the type of nonresponse in any imputations performed. For example, this work has shown that measures such as education, marital status, and current employment status have relatively strong effects on the type of nonresponse but not total nonresponse. This information could be used as a guide to formulate the imputation classes. In this study, respondents with a high school diploma had higher odds of refusing to provide a family income amount than respondents with less than a high school education. However, there was not a substantial difference in the odds of refusing when comparing those with a GED to those with less than a high school education. The categories of GED and high school graduate are often grouped together. This analysis has shown that the type of nonresponse effect is different for respondents with a GED and those who are high school graduates. These differences demonstrate how imputation classes could be constructed to provide better information. For example, during the study period (1997 – 2000), respondents aged 25 – 64 who were high school graduates had a mean family income approximately 35% higher than that for respondents who had a GED.

Future Directions

This work examines the types of income nonresponse as well as total income nonresponse. In the next phase, we wish to further expand on this

work. We plan to utilize the family income follow-up questions that are currently on the NHIS. Respondents who do not provide an income amount are asked if their family's income is less than \$ 20,000 per year or at least \$ 20,000 per year. Respondents who answer this question (do not provide a refusal or "don't know" response) are then asked to place their family's income in a set of pre-defined intervals. This analysis would consist of an ordered logit analysis ranking the income responses according to the level of information provided. This could provide information regarding the characteristics of respondents who provide information in the current follow-up questions, and could prove to be very useful for further questionnaire development by indicating which groups of people are most likely to answer a follow-up question.

In this analysis, age, education, marital status, and employment characteristics emerged as strong correlates of total income nonresponse and type of nonresponse. However, given the sensitive nature of income information, it is plausible that nonresponse to family income questions is related to income itself (nonignorable nonresponse). As noted earlier, if nonignorable nonresponse is present, adjustment procedures, including imputation, become more limited and complex. To determine if nonignorable nonresponse is present, we will include proxy measures of income for nonresponders in future analyses. Proxy measures would be culled from U.S. Census Bureau tract level data, and would include variables such as median household income and median housing value.

Finally, this study illustrated the associations that certain family respondent characteristics had with income nonresponse. However, since total family income is a composite measure involving amounts from multiple sources across multiple family members, we wish to explore the effects of family-level socio-demographics and other family dynamics (such as health status) on income nonresponse.

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TABLE 1: LOGISTIC REGRESSION RESULTS (FAMILY RESPONDENTS AGED ≥ 18)

CHARACTERISTIC	REFUSED vs. DON'T KNOW ^δ		INCOME NONRESPONSE vs. INCOME RESPONSE ^ε	
	ODDS RATIO	99% CONFIDENCE INTERVAL	ODDS RATIO	99% CONFIDENCE INTERVAL
AGE				
18 – 24 years	0.56	(0.45, 0.70)	0.60	(0.53, 0.69)
25 – 54 years	1.20	(1.03, 1.40)	0.55	(0.50, 0.61)
55 – 64 years	1.34	(1.15, 1.55)	0.76	(0.69, 0.83)
65 – 74 years	1.50	(1.32, 1.69)	0.86	(0.79, 0.93)
75+ years ^φ	1.00	-	1.00	-
SEX				
Female	0.78	(0.74, 0.83)	1.22	(1.17, 1.27)
Male ^φ	1.00	-	1.00	-
RACE/ETHNICITY				
Hispanic	0.74	(0.65, 0.85)	0.91	(0.84, 0.99)
Non-hispanic American Indian or Alaska Native	0.77	(0.46, 1.27)	0.90	(0.64, 1.26)
Non-hispanic Asian or Other Pacific Islander	0.73	(0.59, 0.91)	0.93	(0.82, 1.05)
Non-hispanic black	0.91	(0.82, 1.02)	1.11	(1.03, 1.19)
Non-hispanic white ^φ	1.00	-	1.00	-
Non-hispanic multiple race	0.70	(0.50, 0.99)	0.77	(0.62, 0.95)
EDUCATION^ψ				
Less than high school ^φ	1.00	-	1.00	-
High school diploma	1.53	(1.39, 1.68)	1.12	(1.06, 1.19)
GED ¹	1.36	(1.10, 1.69)	0.81	(0.71, 0.93)
Some college	1.69	(1.52, 1.88)	0.91	(0.85, 0.97)
Associate of Arts degree	1.65	(1.43, 1.90)	0.83	(0.77, 0.91)
Bachelor's degree or higher	2.43	(2.15, 2.75)	0.94	(0.87, 1.01)
MARITAL STATUS^ψ				
Married	1.78	(1.56, 2.03)	0.65	(0.60, 0.70)
Widowed	0.97	(0.84, 1.12)	0.95	(0.87, 1.04)
Divorced	1.31	(1.14, 1.51)	0.81	(0.75, 0.87)
Separated	0.96	(0.78, 1.17)	0.83	(0.74, 0.94)
Cohabiting	1.04	(0.85, 1.26)	0.71	(0.65, 0.79)
Never married ^φ	1.00	-	1.00	-
CURRENTLY EMPLOYED?^ψ				
Yes	1.80	(1.58, 2.06)	1.01	(0.95, 1.08)
No ^φ	1.00	-	1.00	-
WORKED IN LAST CALENDAR YEAR?^ψ				
Yes	0.82	(0.71, 0.94)	0.69	(0.64, 0.75)
No ^φ	1.00	-	1.00	-
BORN IN THE U.S.?				
Yes	1.24	(1.11, 1.39)	0.83	(0.78, 0.90)
No ^φ	1.00	-	1.00	-
FOOD STAMPS?^ψ				
Yes	0.54	(0.46, 0.64)	0.84	(0.77, 0.92)
No ^φ	1.00	-	1.00	-
SALARY/SELF-EMPLOYED?^ψ				
Yes	0.69	(0.61, 0.77)	1.02	(0.95, 1.10)
No ^φ	1.00	-	1.00	-
SSI²/WELFARE?^ψ				
Yes	0.69	(0.60, 0.79)	0.82	(0.76, 0.89)
No ^φ	1.00	-	1.00	-

TABLE 1: LOGISTIC REGRESSION RESULTS (FAMILY RESPONDENTS AGED ≥ 18)

CHARACTERISTIC	REFUSED vs. DON'T KNOW ^δ		INCOME NONRESPONSE vs. INCOME RESPONSE ^ε	
	ODDS RATIO	99% CONFIDENCE INTERVAL	ODDS RATIO	99% CONFIDENCE INTERVAL
INTEREST/DIVIDENDS?^ψ				
Yes	0.80	(0.73, 0.87)	0.63	(0.60, 0.67)
No ^φ	1.00	-	1.00	-
CHILD SUPPORT/OTHER INCOME?^ψ				
Yes	0.54	(0.49, 0.61)	0.78	(0.73, 0.83)
No ^φ	1.00	-	1.00	-
SOCIAL SECURITY/PENSIONS?^ψ				
Yes	0.71	(0.64, 0.79)	0.93	(0.87, 0.99)
No ^φ	1.00	-	1.00	-
HOUSING TENURE^ψ				
Own	1.37	(1.25, 1.51)	1.27	(1.19, 1.35)
Rent ^φ	1.00	-	1.00	-
Other	0.75	(0.60, 0.94)	1.11	(0.97, 1.28)
NUMBER OF ADULTS IN FAMILY				
One	2.38	(2.09, 2.71)	0.45	(0.41, 0.49)
Two	1.52	(1.39, 1.66)	0.75	(0.71, 0.79)
Three or more ^φ	1.00	-	1.00	-
CHILDREN IN FAMILY?				
Yes ^φ	1.00	-	1.00	-
No	1.10	(1.01, 1.20)	1.16	(1.10, 1.21)
MULTI-FAMILY HOUSEHOLD?				
Yes	0.57	(0.41, 0.80)	0.64	(0.54, 0.76)
No ^φ	1.00	-	1.00	-
GEOGRAPHIC REGION				
Northeast	1.03	(0.88, 1.20)	1.26	(1.15, 1.39)
Midwest	0.83	(0.70, 0.98)	1.25	(1.14, 1.37)
South ^φ	1.00	-	1.00	-
West	0.97	(0.83, 1.13)	1.03	(0.92, 1.14)
URBAN OR RURAL RESIDENCE				
Urban	1.23	(1.07, 1.40)	1.08	(0.99, 1.17)
Rural ^φ	1.00	-	1.00	-
MSA³ STATUS				
MSA - Central city	1.40	(1.13, 1.72)	1.08	(0.94, 1.24)
MSA - Not central city	1.35	(1.11, 1.64)	1.15	(1.01, 1.30)
Non-MSA ^φ	1.00	-	1.00	-
YEAR				
1997	0.95	(0.84, 1.06)	0.77	(0.73, 0.82)
1998	0.85	(0.77, 0.94)	0.89	(0.84, 0.95)
1999	0.92	(0.83, 1.01)	0.97	(0.92, 1.03)
2000 ^φ	1.00	-	1.00	-

^δThe odds of family respondents providing a refusal as opposed to providing a "don't know" response to the family income amount question.^εThe odds of family respondents not providing a family income amount as opposed to providing an amount.^φReference category for the odds ratio (OR = 1.00)^ψThese characteristics included an "unknown" category that was incorporated into the logistic regression models but is not shown in this table.¹General Educational Development high school equivalency diploma.²Supplemental Security Income.³Metropolitan Statistical Area; a measure of population density as defined by the U.S. Census Bureau (<http://www.census.gov>).

DATA SOURCE: 1997 – 2000 National Health Interview Survey