

EVALUATION OF ITEM RESPONSE FOR KEY VARIABLES IN THE 1994 NATIONAL EMPLOYER HEALTH INSURANCE SURVEY (NEHIS)

Esther Hing, Abigail J. Moss, National Center for Health Statistics
Esther Hing, NCHS, 6525 Belcrest Rd., Rm. 954, Hyattsville, MD 20782

KEY WORDS: Subnational estimates, health insurance coverage, nonresponse

Introduction

The 1994 National Employer Health Insurance Survey (NEHIS) is an ambitious survey designed to fill in some of the gaps of previous and existing employer surveys. It was designed to produce comprehensive data on private health insurance spending by employers for the National Health Accounts maintained by the Health Care Financing Administration at both the state and national levels. It was also designed to provide data for monitoring the effects of health care reform, for describing the current employment-based health insurance system and for modeling aspects of health care reform. The value of 1994 NEHIS data for these uses is affected by the quality of the reported data, since high levels of nonresponse may bias survey estimates and distort inferences based on final findings (Cochran, 1977; Kish, 1965).

Given the many uses of the NEHIS data, the list of data items included in the survey is extensive, as is the level of detail obtained about employers and their health insurance plan provisions. This paper examines the completeness of responses for selected key data items collected in the NEHIS and offers some likely explanations for item non-response. Item response rates presented in this paper are based on preliminary tabulations from the 1994 NEHIS. The items chosen to assess item response for this paper are either key analytic variables or are representative of similar NEHIS questionnaire items and they incorporate both establishment level and health insurance plan level variables. They include: the total number of employees eligible for benefits at an establishment, the number of employees enrolled, the number of employees with family coverage, total health insurance spending, payroll, and percent of payroll devoted to health insurance cost for an establishment; monthly premiums and employee share of monthly premiums; deductibles, coinsurance, and co-payments; and total claims paid during plan year 1993. Item response rates obtained for a few covered services are also shown. In addition to these key variables, also presented are item response rates for a few characteristics of sampled establishments (health insurance eligibility).

Some of the key variables are actually 'composite variables'; that is, they were derived by combining several different data items on the questionnaire. For example, the

variable- number of employees eligible for health benefits as of December 31, 1993- is derived by summing the reported number of full-time employees eligible for health benefits and part-time employees eligible for health benefits which were separate questionnaire items.

Item response rates for the analytic variables evaluated in this paper are shown by sample unit characteristics such as, establishment and firm size, sector (private business versus government), number of health insurance plans offered, whether or not the establishment was part of an 'operational' single establishment firm (SEF) or multi-establishment firm (MEF), and whether respondents referred to plan brochures or other records during the interview. For the NEHIS, MEFs were cases in which two or more establishments belonging to the same firm were sampled. In contrast, single establishment firms (SEF) were either 1) a single location firm or 2) a multiple location firm in which only one establishment was sampled. Firm size examined in this paper was self-reported.

Background and Methods

The NEHIS data were obtained from a nationally representative sample of business establishments and governments. According to Office of Management and Budget Statistical Policy Working Paper 15, an establishment is "an economic unit, generally at a single physical location, where business is conducted or where services or industrial operations are performed." The NEHIS was conducted under contract by Westat, a research firm in Rockville, Maryland and the data were collected from April-December 1994 through computer-assisted telephone interviews. Health insurance plan information was collected for 1993 plan year policies.

About 38,000 sample establishments participated in the survey, for a final overall response rate of 72 percent. The final response rate for governments was higher than that for private establishments, 86 percent compared to 71 percent. This paper evaluates item response rates primarily from those sampled establishments that reported offering group health insurance to their employees, or about 27,000 establishments. Among those establishments, plan data were obtained for 46,300 sampled health insurance plans, for a plan response rate of 93 percent.

A unique feature of the 1994 NEHIS is that it collected health insurance plan provisions from a representative sample of plans. If an establishment offered from one to

five plans, plan information was requested about all plans. However to reduce respondent burden, if more than five plans were offered by an establishment, a subsample of no more than five plans was selected. If an establishment was part of a larger firm where multiple establishments were sampled (MEF), plans among those sampled establishments were selected at an even lower sampling rate in an attempt to reduce respondent burden among persons that might be responding for multiple establishments. Although there were efforts to limit response burden among MEF respondents, it is clear that in many cases it was much greater than for SEF respondents.

Nonresponse to a data item for the NEHIS resulted from one of the following reasons: the respondent did not know or refused to provide the information, the answer category was left blank, or the answer given was determined to be an invalid response during subsequent data editing. Invalid responses included responses that failed edit or range checks for consistency or reasonableness.

This paper presents item response rates only at the national level; however, response rates were also compared for these same items by state. While there is state variation in item response for these variables, most of the variation is similar to trends found at the national level. That is, items that were well reported at the national level had lower variation in item response at the state level and items that were poorly reported at the national level had high state variation.

Differences in item response rates by establishment characteristics were evaluated using a Bonferroni's test of significance for multiple comparisons. The sampling error for item response rates was approximated using the simple random sample (srs) standard error estimate for an unweighted proportion p , where n is the base of the proportion and n is large:

$$s.e.(p) = \sqrt{p(1-p)/n}$$

Results

Table 1 presents overall item response rates for selected establishment variables. For about 93 percent of sample establishments, the number of employees eligible for health benefits and the number of employees enrolled in an employer-sponsored health plan were obtained. Similarly, the NEHIS had high item response regarding the minimum number of hours employees were required to work to qualify for health benefits, and regarding provision of health benefits to retirees. Certain establishment cost data items however, were not as well reported; total 1993 employer and employee health insurance costs (79 percent), 1993 annual payroll (60 percent), and the percent of 1993 payroll devoted to health insurance costs (55 percent).

Table 2 presents item response rates for numbers of eligible employees and covered employees by sector, establishment size, firm size, and type of establishment. The response pattern for covered employees was very similar to that for eligible employees. Item response for these two variables tended to decline with increasing establishment size. Response rates for the number of eligible employees decreased from 97 percent among establishments with under 10 employees to 89 percent among establishments with 100 or more employees. The response rates for these two variables by firm size categories, in contrast, are basically high for all firm size categories except the largest (1000 or more employees). The number of employees eligible for health benefits and the number of enrolled employees also were not as well reported for MEFs as for SEFs. These findings probably relate to both the company record keeping practices and the NEHIS data collection methodology for large firms. As previously mentioned, most large firms sampled were included in MEF groups. Often, the MEF respondents administered health benefits at the firm level and frequently, the records of employees' eligibility and enrollments were not maintained by establishment. Even though attempts were made to contact individual establishments in such cases, employee counts for MEFs were nevertheless not as well reported as for SEFs. There were also a substantial number of MEF sample cases still being worked when the NEHIS data collection period ended.

Table 3 shows that 1993 health insurance cost, payroll, and percent of payroll devoted to health insurance costs all had higher response among the public sector than the private sector. For example, 93 percent of governments reported 1993 health insurance costs compared with 77 percent of private establishments. Governments also more frequently provided payroll information than did private businesses, 79 percent versus 59 percent. The same variables, however, all tended to decline with increasing firm size.

Responding for multiple plans is a more difficult cognitive task than responding for one plan. Table 3 also shows that higher response burden, as measured by number of plans offered to employees, was associated with lower response for these cost variables. Lower response was also associated with MEF establishments, due in part to their lack of records at the establishment level, but also due to their higher response burden. Finally, payroll information was generally available from a different department than that of health benefits administrator respondents. This further complicated obtaining responses for this data item.

Table 4 presents response levels for monthly premiums or premium equivalents for single coverage and family plans by whether it was fully insured or a self-insured plan. A health insurance plan is fully insured when the financial risk for claims incurred by enrollees is assumed by a health

insurance carrier. A self-insured plan is one in which the financial risk for claims incurred by enrollees is assumed by a company or organization.

Premium amounts were reported somewhat more often for fully insured than self insured plans. Employee share of the premiums were similarly well reported for fully and self-insured plans, though reporting levels for employee share for family coverage was lower for self-insured than among fully insured plans (82 percent compared to 92 percent of the plans). Reporting levels for monthly health insurance premium amounts in fully insured plans, in fact, increased with establishment size. In contrast, reporting levels for premium equivalents among self insured plans were similar across all establishment size groups. A somewhat different pattern was found when response rates for premium amounts were compared for different size firms. Table 4 shows lower response for fully insured premium amounts among firms with 1,000 or more employees, 80 percent, compared with 90 to 95 percent for smaller size firms. Lower item response among the largest firm size reflects primarily two phenomena; greater respondent burden to complete the interview for firms offering multiple plans or with multiple sampled locations; and incomplete information obtained for some of the largest MEF cases, at the time data collection for the NEHIS ended. Finally, response to premium amounts somewhat increased when respondents referred to plan brochures or other records during the interview.

As shown in tables 5 and 6, most of the remaining plan level variables were uniformly well reported with overall item response over 90 percent. The exceptions to this trend were: 1993 total claims paid by plan (28 percent), total employee enrollments for individual plans (83 percent) and employee enrollments for family coverage (73 percent).

Factors found to affect response for reporting employee enrollments were sector and firm size. Reporting of both overall employee enrollments and family enrollments was better for the public than private sector. Reporting levels for both of these variables, however, declined with increasing firm size. Increasing firm size is associated with increasing organizational complexity. Also, nearly all firms with over 100 employees offer health benefits to their employees (Sullivan, Miller, Johnson, 1992) and therefore are more likely to have centralized health benefits administration. Although centralized record keeping in large firms improved response to certain variables, such as plan premium amounts, the same respondents often had difficulty reporting data for individual establishments in a firm, as in this example- the number of enrolled employees in a specific plan at each establishment- because records for this type of data item were typically maintained only for the firm as a whole, rather than at the establishment level. Response for these two variables also varied by the number of plans offered. Since the majority of questions in the NEHIS refer to characteristics of individual plans offered

by establishments, it appears that greater respondent burden, as measured by the number of plans offered, had a negative effect on item response.

Annual claims paid for sample plans had low reporting levels regardless of sector, establishment size, and firm size. Only a minority of establishment respondents could provide this information. Clearly, other research is needed to identify and develop the most effective survey methodology to collect claims data.

Item response rates for the specific types of covered services examined for this paper were generally high (table 6). In most cases, high item response was obtained when asking about whether the plan provided coverage for routine adult physical examinations and routine dental care. Response rates for childhood immunizations, however, were subject to more variability. For example, item response rates for plan coverage of childhood immunizations actually improved with increasing firm size. This suggests that the quality of reporting increased with increasing firm size, another indication that health benefits managers from larger companies are somewhat more knowledgeable about plan benefits. Similarly, item response rates for deductibles and co-insurance were somewhat higher for large establishments. Such differences reflect variations in levels of knowledge of plan benefits between health benefits managers who likely responded for larger establishments compared to respondents from smaller establishments who often were the owner or office manager, and less knowledgeable about the plan features.

Conclusions

A major strength of the 1994 NEHIS data is its large sample size of about 38,000 establishments from which state estimates will be produced. Also, a number of data items obtained in the NEHIS have not been available previously. This paper has shown that many of the key variables from this survey have high levels of response although there are several where the overall response rate was in the 80 percent range. We observed, however, that selected item response rates obtained from other surveys for comparable variables were similar or lower. For example, the NEHIS response rate for sample plan enrollment for establishments with 100 or more employees of 84 percent, was similar to the combined rates from governments and large and medium private establishments from the 1992 and 1993 Employee Benefits Surveys (EBS)- 84 percent. Item response rates from the 1993 Robert Wood Johnson Foundation's (RWJF) Employer Survey of 10-states for premium and premium equivalents for single coverage were slightly lower than that reported in the NEHIS (1994 NEHIS Request for OMB Review).

We also identified several NEHIS variables with low item response rates. In particular the NEHIS item missing most frequently was annual claims paid for sample plans. This data item was simply not available for about 70

percent of respondents. After the end of data collection, data retrieval efforts were applied for cases missing key data items, including annual claims. Data retrieval consisted of follow up calls with potential informants that respondents had identified at the end of the interview. Despite this effort, data retrieval for claims data for fully insured plans was successful in only about 25 percent of the cases followed up, suggesting that this information is routinely unavailable to respondents. Further research is needed to identify the best respondent source and survey methodology for obtaining claims data (LeBlanc, Edwards, and Cunningham, 1995).

The lower response rates observed for MEF establishments is another methodological concern that needs to be addressed in future NEHIS surveys. Due to the corporate structure of American businesses, any establishment-based health insurance survey of employers must deal with the likelihood that the best respondent for multiple sample establishments is the one person administering health benefits to them. The higher response burden associated with MEF compared with SEF cases needs to be reduced through fewer questions or fewer cases.

REFERENCES

- Cochran, WG. 1977. Sampling Techniques. Third Edition. John Wiley & Sons, New York.
- Kish, L. 1965. Survey Sampling. John Wiley & Sons, New York.
- 1994 National Employer Health Insurance Survey (NEHIS) Request for OMB Review.
- Sullivan CB, Miller M, Johnson CC. Employer-Sponsored Health Insurance in 1991, Health Insurance Association of America, 1992.
- U.S. Department of Labor, Bureau of Labor Statistics. Employee Benefits in State and Local Governments, 1992, Bulletin 2444. July 1994.
- U.S. Department of Labor, Bureau of Labor Statistics. Employee Benefits in Medium and Large Private Establishments, 1993, Bulletin 2456. November 1994.
- LeBlanc, L., Edwards, S. and Cunningham, P. The National Employer Health Insurance Survey Report on Data Retrieval for Missing Critical Variables, September 1995.

Table 1. Item response rates of selected NEHIS establishment variables.

Variable	Item response rate
	Percent
Employees eligible for health benefits	93
Employees enrolled in a plan	93
Retirees 65+ eligible for health benefits?	98
Minimum hours worked for coverage	99
1993 Payroll	60
1993 Total health insurance cost	79
Total health insurance costs as a percent of payroll	55

Table 2. Item response rates for establishment employee variables

Characteristic	Number of eligible employees	Number of covered employees
	Percent	
Sector		
Private	93	92
Public	97	98
Establishment size		
Under 10	97	96
10-24	96	95
25-99	93	92
100+	89	88
Firm size		
Under 100	100	100
100-499	100	99
500-999	98	96
1000+	80	77
Establishment type		
SEF	99	99
MEF	77	74

Table 3. Item response rates of establishment cost variables

Characteristic	1993 HI Cost	1993 Payroll	% HI cost to Payroll
		Percent	
All establishments	79	60	55
Sector			
Private	77	59	53
Public	93	79	73
Firm size			
Under 100	96	71	77
100-499	89	70	65
500-999	78	53	45
1000+	48	24	18
Number of plans offered			
1 plan	87	66	63
2+ plans	60	44	38
Establishment type			
SEF	91	69	70
MEF	43	19	13

Table 4. Item response rates for monthly premiums (fully insured plans) and premium equivalents (self-insured plans) and employee share by coverage level.

Characteristic	FULLY INSURED PLANS				SELF-INSURED PLANS			
	Single coverage		Family coverage		Single coverage		Family coverage	
	Premium	Employee Share	Premium	Employee Share	Premium Equivalent	Employee Share	Premium Equivalent	Employee Share
			Percent				Percent	
All establishments	91	93	91	92	83	93	80	82
Sector								
Private	89	92	89	90	82	92	79	81
Public	96	97	97	97	89	95	86	89
Establishment size								
Under 10	84	89	86	87	83	89	81	79
10-24	91	94	90	91	83	92	81	83
25-99	93	95	92	93	83	93	80	82
100+	94	95	94	94	82	94	80	83
Firm size								
Under 100	90	93	91	92	78	93	76	83
100-499	95	96	93	93	82	94	79	83
500-999	92	94	93	93	83	94	79	83
1000+	80	85	80	83	83	92	81	81
Establishment type								
SEF	91	94	92	92	81	94	79	83
MEF	78	84	77	81	83	92	80	81
Number of plans offered								
1 plan	92	94	93	93	84	93	82	83
2+ plans	90	93	90	91	81	92	78	81
Referred to brochure								
Yes	95	97	95	95	86	94	83	85
No	89	93	90	91	81	91	79	81

Table 5. Item response rates for selected plan variables.

Establishment characteristic	Enrollment		Single coverage deductible	Outpatient co-insurance	Total annual claims paid
	Total	Family coverage			
All establishments	83%	73%	93%	92%	28%
Sector					
Private	79	70	93	92	30
Public	99	87	95	100	19
Establishment size					
Under 10	85	80	88	87	35
10-24	83	74	93	91	26
25-99	80	71	94	94	26
100+	84	70	95	95	26
Firm size					
Under 100	94	91	90	89	31
100-499	83	76	95	94	29
500-999	77	64	96	95	29
1000+	63	46	94	94	31
Establishment type					
SEF	87	81	92	91	30
MEF	61	43	94	93	30
Number of plans offered					
1 plan	89	80	93	92	36
2+ plans	77	65	93	93	19
Referred to brochure					
Yes	83	72	97	97	26
No	85	76	92	92	30

Table 6. Item response rates for selected covered services.

Establishment characteristic	Routine physicals	Routine dental	Childhood immunizations
All establishments	95%	97%	91%
Sector			
Private	94	97	90
Public	96	97	94
Establishment size			
Under 10	92	96	82
10-24	95	98	89
25-99	95	97	92
100+	96	97	96
Firm size			
Under 100	93	98	83
100-499	97	98	94
500-999	96	98	96
1000+	94	95	96
Establishment type			
SEF	95	98	88
MEF	94	95	95
Number of plans offered			
1 plan	95	98	89
2+ plans	94	96	94
Referred to brochure			
Yes	98	100	97
No	96	99	88