

THE SURVEY OF 1992 HEALTH EXPENDITURES: A QUICK RESPONSE SURVEY

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I. Introduction

Early in 1993, the Health Care Financing Administration requested the Bureau of Labor Statistics to conduct a special survey to estimate the costs of employer sponsored health benefits in the civilian economy. These estimates were urgently needed in support of the efforts to reform the nation's health care system. The Health Care Financing Administration itself does estimate these costs. However, they have had to use a number of different data sources of varying scope, definition, and data quality. They needed current estimates that were comprehensive, consistent, and high quality.

The Bureau of Labor Statistics agreed to conduct a special survey to estimate the aggregate costs of employer sponsored health benefits in calendar 1992 for the civilian, nonfarm, non-Federal economy. We agreed to provide separate estimates of the employer and employee contributions to these costs, separate estimate detail for State and local governments and private industry, economic activities, broad geographic regions, and employer sizes. We agreed to estimate all costs associated with employer sponsored health benefits, including those for former workers, such as retirees.

Three aspects of the Bureau's mission determined, to a very large extent, the design possibilities for the Survey of 1992 Health Expenditures, a quick response survey. First, the survey results were needed as quickly as possible, and no later than the end of 1993 - 10 months after the request. Second, the estimates had to be comprehensive - not only in the scope of health costs they included, but also in the scope of employers and employees covered by them. Third, the estimates would be highly visible. They would be used to estimate effects of health care reform proposals on the National Health Account (one portion of the National Income and Product Accounts). It was these three

imperatives that drove the design and methods of the quick response survey.

This paper will compare the actual survey experience in a number of areas against expectations.

II. Choice of Survey Vehicle and Basic Methods

The three mission imperatives mandated the choice of a survey vehicle and data collection methods to be used for a quick response survey of the costs of health benefits. The first imperative to deliver survey results as soon as possible mandated using an existing survey and telephone data collection. The second imperative to produce comprehensive estimates mandated an establishment survey which covers: all 50 states and the District of Columbia, establishments of all sizes, and all employees regardless of occupation. The third imperative mandated that data need to be of high quality.

The Employment Cost Index (ECI) survey was chosen as the survey vehicle because it could best meet the three aspects of the Bureau's mission to provide the requested estimates. The ECI survey is an establishment survey conducted quarterly by the Bureau of Labor Statistics. The survey estimates employers' costs for wages, salaries, and 23 employee benefits, including costs for providing health insurance. All state and local governments and private sector industries, except for farms and private households, in all 50 states and the District of Columbia are covered in the survey.

The quarterly ECI survey data are collected primarily by telephone. The data collection staff have been extensively trained and have wide experience in collecting data on benefits costs. To provide the requested data quickly, the Survey of Health Expenditures was appended to the scheduled ECI quarterly survey during June and July 1993.

III. Survey Design and Estimation

The scope of the Survey of Health Expenditures was the June 1993 ECI survey sample. The ECI sample of employers is selected from State Unemployment Insurance (UI) files that serve as the sampling frame for the ECI survey. The ECI sample is selected using a 2-stage stratified design with probability proportional to establishment employment sampling at each stage. The first stage of sample selection is a probability sample of establishments and the second stage of sample selection is a probability sample of occupations within the sampled establishments. For the Survey of Health Expenditures, only the first stage of sample selection was needed.

For a more detailed description of the ECI sample design, refer to the BLS Handbook of Methods (Bulletin 2414, September 1992), and Gessley, et al paper presented at another session of these meetings.

The Survey of Health Expenditures sample consisted of 8,670 units selected for the June 1993 ECI survey. Of these, 5,638 sample units were eligible to be interviewed and 3,032 sample units were ineligible to be interviewed. Of the ineligible units, 41 percent (1,235 units) were units that ceased business activity sometime between the time of their selection to the sample and the June 1993 ECI survey, or ceased employing workers during this period, or were otherwise no longer part of the civilian nonfarm economy. The remaining 59 percent (1,797 units) had previously indicated their inability or unwillingness to participate in the ECI survey. Previous refusals will exist whenever the design being used is an existing panel or longitudinal survey. Due to lack of resources, no attempt was made to contact the previous refusals.

The survey estimation method uses the Horvitz-Thompson estimator, which assigns the reciprocal of each sample unit's probability of selection as a weight to the unit's expenditure data. Two weight adjustment factors are applied to the unit's data. The first factor accounts for the establishment nonresponse which occurred prior to the June ECI survey and during the Survey of Health Expenditures. The second, post-stratification factor, accounts for different ages of universes that are represented by the existing sample.

The general form of the estimator for aggregate health care expenditures E is:

$$E = \sum_{k=1}^L f_{2k} \sum_{i=1}^{n_k} f_{1i} E_i / p_i$$

where,

i = establishment

p_i = the probability of selecting establishment i

E_i = health care expenditure for establishment i

f_{1i} = nonresponse adjustment factor

n_k = number of usable establishments in the k th cell

f_{2k} = post-stratification factor for cell k

k = benchmark cell

L = number of benchmark cells

The standard errors for the survey of health care expenditures estimates were calculated using the software package SUDAAN (Professional Software for Survey Data Analysis for multi-stage sample designs). SUDAAN uses the first-order Taylor Series approximation, incorporating design parameters and survey weights, to compute standard errors for multi-stage survey estimates.

IV. Data Request

The 5,638 eligible establishments were notified, in advance, what data were needed and that these data would be used as part of ongoing health care reform efforts. Respondents were requested to provide their calendar year 1992 expenditures for all health care plans available through the employment relationship. They were to include both insured and self-insured plans, and plans covering active employees, dependents, and former employees. (See Department of Labor release 93-560 for more information.)

Separate data were requested on employer health care expenditures and employee health care expenditures. When these data were not available separately, respondents were asked for either the employer expenditure or the employee expenditure, if available, and the total expenditure. Requested employee health care expenditures did not include employee deductibles and co-payments. Respondents were also asked to provide year-end 1992 employment for post-stratification purposes.

Several questions were asked as part of the respondent interview to help determine the quality of the expenditure data provided. These questions were included in the survey for several reasons. BLS lacked experience in the collection of aggregate expenditure data for prior time periods and, given the high visibility of the results and short delivery time (eliminating the possibility of conducting normal tests), BLS was interested in knowing as much as possible about how the reported data deviated from ideal data. Some data varied from strict survey definitions, but were accepted as alternative data. BLS recognized four potential areas in which alternative data could effect the accuracy of estimates, and wanted to be able to estimate the impact in these four areas, if possible.

1) Alternative data may have excluded some health benefit costs. Respondents were asked whether the expenditure data provided included expenditures for retirees, former employees covered under the health care continuation provisions of the Consolidated Omnibus Budget Reconciliation Act of 1985 (COBRA), and other health care plans, such as dental and vision coverage. Data were accepted if the expenditures for all medical plans for all active employees were included. If expenditures for retirees, COBRA recipients, or related plans were missing, the data provided by the establishment were nonetheless included in the survey. The fact that expenditures for retirees, COBRA recipients, or related plans were missing in some units' expenditures introduces downward bias in the estimates. We had no way to adjust for these missing data. Since these missing expenditures represent a small portion of the total expenditures, their impact on the estimates is small as described in the results section.

2) Alternative data may not have related strictly to calendar 1992, or to all of 1992. Thus, the time period covered by the reported expenditure was ascertained. Concern that a large number of establishments would not be able to report their expenditures on a calendar year basis, without undue hardship, led us to accept data as long as they included at least some of 1992. Data that related to 12 months were included without adjustment; partial year data were annualized.

3) Alternative data may have been reported for a scope of employer operations different than that of the sampled unit. Although the ECI survey covers

single-site establishments, data are often only available for larger units, for example corporate-wide data. This was also anticipated for the Survey of Health Expenditures. Therefore, data were accepted that related to larger or smaller (representative) employer scopes of operations. Employment data related to the expenditure were also captured, and used to adjust the expenditure.

4) Finally, data were captured to determine if the reported expenditures included costs for benefits in addition to health care, such as life or disability insurance. There is long ECI experience with such combined data, and procedures exist to determine the relationships between the costs of individual benefits when combined data are captured. When encountered, these data were adjusted based on factors developed in the ECI.

While additional data were of interest to both the BLS and HCFA, concerns for timing, respondent burden, quality of the data being collected, and resources limited the requests. Questions considered, but not included in the final survey design, included expenditures by type of health care plan, type of benefit (such as medical and dental plans), and expenditures by type of recipient (such as active employees and retirees).

V. Data Collection and Review

A two-page questionnaire was developed by a team of economists, statisticians, and cognitive psychologists for use in data collection. Due to the limited time constraints detailed testing of this questionnaire was not possible. Limited testing in two BLS regional offices took place during March 1993, and led to some minor changes in the questionnaire design. In general, the test indicated that the questionnaire was appropriate for capturing the required data and that the data could be collected by telephone.

The limited test in March 1993 did not allow the opportunity to collect any quantifiable data on the availability of items being requested, the difficulties respondents might encounter, or the time it takes to complete the questionnaire. These data were collected for about 300 establishments that were contacted out of the BLS Washington office. These data will be useful in considering future quick response requests.

Data collection for the Survey of Health Expenditures took place during and immediately following telephone

collection for the June 1993 ECI. Concern about nonresponse for the ECI led to the procedure of collecting ECI data first, followed by health care expenditure data. A pre-notification letter was used to announce the special collection of the health expenditures data.

Following data collection, all questionnaires were reviewed in the BLS regional offices and in Washington. It is the nature of quick response surveys that they cover a new and unfamiliar topic. This and the anticipated high visibility of the data led to concern for data quality and consistency, and to an above normal amount of review. In addition, the absence of time to develop a comprehensive computerized editing system led to the need for more manual review of data.

VI. Results

The survey results show that employers and employees spent \$258.5 billion in calendar 1992 for health benefits provided in the work place. The standard error on the total estimate is \$12.7 billion. See U. S. Department of Labor press release 93-560 for complete survey results.

The distribution of the total aggregate health cost by economic activity, geographic region, and employer size class reflects the proportions of employees with health benefit plans, and the generosity of those benefit plans. Thus, for example, state and local governments accounted for 21 percent of the aggregate cost, but just 15 percent of the surveyed universe employment. Compared to all of the private sector, the near universal coverage of government employees, and the more generous benefit provisions for them explain the disparity in the ratios. Similarly, employers of 100 or more workers accounted for more of the total health expenditure than their representation of universe employment would suggest. All implied comparisons were significant at a level of $\alpha = .05$.

On average, employers paid 86 percent of the total expenditure. With very few exceptions, employers paid for roughly this proportion of the total cost, irrespective of economic activity, size, or geographic region. No distinction was made in employers contributions for single and family coverage.

Employer response to the survey was about as expected. Although roughly 5 out of 6 (84 percent) employers that were contacted cooperated, the rate of net usable response amounted to 63 percent. (See Table 1.) The difference is explained largely by

sample attrition prior to the Survey of Health Expenditures. Although cooperation was uniform across industries, net response varied as a reflection of the ages of the industry samples, and the attrition in each of them during their tenure. Thus, for example, the overall response rate for private industry employers was just 59 percent, reflecting as much as 5 years tenure in the survey sample and varying rates of attrition. In comparison, the response rate for government employers was about 23 points higher, reflecting their more recent introduction into the survey sample and a uniformly low rate of attrition. For both, better than 4 out of 5 employers that were actually contacted for the Survey of Health Expenditures provided a usable response.

The Survey of Health Expenditures had some effect on the overall response to the Employment Cost Index survey, for the June and September 1993 quarters. During the June quarter, the conduct of the Survey of Health Expenditures did not allow BLS Field Economists the time they usually have to pursue cooperation for the ECI. Temporary nonresponse increased. During the September quarter, work to catch up on various activities deferred because of the Survey of Health Expenditures produced the same result. By the onset of the December quarter, however, response returned to expected levels.

There were two types of item nonresponse of note. About one out of 10 (427) respondents were able to report only their employer or their employee expenditure for health benefits. One out of 9 (552) respondents were able to report only their total health expenditure; that is, they were unable to report the employer and employee expenditures separately. For both, the missing data were imputed. Only 2 percent of the total expenditure estimate was imputed to account for missing employer or employee expenditures. (see Table 2.)

Over half (57 percent) of the total health expenditure estimate was based on alternative data forms reported by the employers (see earlier discussion). This was the case for both the reported employer costs and employee costs. The largest type of alternative data (about 36 percent of the total expenditure estimate) was costs originally reported for employer operations other than the sampled unit of operations. These were adjusted to reflect the sample unit scope. Another form of alternative data (15 percent of the total expenditure estimate) related to a time period other than calendar 1992. However, four-fifths of these costs related to a 12-month period that included at least 6 months of

1992. About 12 percent of the total cost estimate was based on reported alternative costs that needed adjustment, because they included the costs of other benefits. Conversely, roughly 8 percent of the total expenditure cost was based on alternative data that excluded some of the requested health benefits costs. Most of this data excluded the costs associated with the health benefits for retirees.

The magnitude of alternative data and the types of alternative data used varied for the different survey estimates. For example, two-thirds of the estimated expenditure for state and local governments was based on alternative data, compared to just over half of the estimated expenditure for the private sector. For both, the reliance on data that needed adjustment to conform to the scope of the sample unit was the most common form of alternative data. Compared to the private sector estimate, however, more of the governments estimate reflected data reported for other than calendar 1992, and data that excluded the costs of retiree health benefits.

It is thought that the effect of using the alternative data was not detrimental to the overall survey estimates. When the estimates were reproduced without the alternative data, the change in the total was very slight, about 0.2 percent. However, the change in individual estimates varied a lot, depending on the extent and type of alternative data reported. For governments, the expenditure estimate would have been 15 percent higher without the alternative data, while in private industry, it would have been 4 percent lower. The heavy reliance on alternative data that related to 1991-1992 fiscal years, and data that excluded the costs of retiree health benefits is thought to have lowered the published expenditure estimate for government. Moreover, the standard error associated with the estimate without alternative data was three times that of the published estimate with alternative data. Therefore, definitive conclusions about the effect of alternative data on specific expenditure estimates are hard to reach.

VII. Summary and Conclusions

Utilizing the existing Employment Cost Index survey resources and sample, the BLS was able to launch quickly the Survey of Health Expenditures. Results were published in December 1993, just 10 months from inception to fruition.

Our concern that the additional respondent burden arising from the Survey of Health Expenditures would adversely affect the quality of data collected for the ECI, resulted in a design for the Health Expenditures Survey that kept respondent burden to the absolute minimum. There is some indication of increased nonresponse to the ECI during and just following the time of the Survey of Health Expenditures. We think extending the BLS resources curtailed normally successful efforts to follow up nonresponse to the ECI. There is no evidence whether respondent burden or reduced follow-up had more impact.

When choosing an existing survey vehicle for a quick response survey, the type of estimates to be produced and the time available to produce them are important factors, but should not be the only criteria. Another major consideration should be the operational characteristics of the existing sample. There were two characteristics of the existing sample of employers for the ECI that could potentially have affected the results for the Survey of Health Expenditures. First, there was the significant sample attrition prior to the survey in some areas of the sample. Second, the reporting scopes of the sample employers were often not in accord with the scopes of available health expenditures. Adjustments to the expenditure scopes were needed often.

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Table 1. Sample units by response status, economic sector, and region - 1992 Survey of Health Expenditures

Sample Unit Characteristics	# of Units Sampled	# of Units in Business as-of June 93	Contact Sample	Usable Responses	Response Rate a*	Response Rate b*
Total Sample	8,670	7,435	5,638	4,681	63 %	83 %
State and Local Government	1,187	1,133	1,038	928	82	90
Private Industry	7,483	6,302	4,600	3,753	60	82
Northeast	2,071	1,783	1,378	1,178	66	85
South	2,029	1,789	1,365	1,133	63	83
Midwest	2,832	2,411	1,814	1,450	60	80
West	1,738	1,452	1,081	920	63	85

*Response rate a is calculated to equal the number of usable responses as a percent of the number of units in business as of June 1993. Response rate b is calculated to equal the number of usable responses as a percent of the contact sample.

Table 2. Distribution of estimate data by quality characteristics - 1992 Survey of Health Expenditures (selected estimates)

Quality characteristic	Percent of estimate				
	Total	State and local governments	Private Industry	Establishments with Under 100 Workers	100 or more Workers
Imputed data	2	1	2	2	2
Data that met all definitions	41	33	44	53	35
Alternative data that -	57	66	54	45	64
Excluded coverage	8	15	7	5	10
Retiree coverage excluded	7	11	6	5	8
Other excluded coverage	4	7	4	3	5
Did not cover all of 1992	15	38	9	11	18
Less than 6 months	2	1	2	4	1
6 to 11 months	13	37	7	7	16
Was adjusted for reporting scope	36	39	36	22	44
Was adjusted for benefit scope	12	9	13	17	9

Notes: Reported data may be alternative for more than one reason. Therefore, sums of alternative percents may exceed 100.