Examining Attrition In The Physician Component Of The Community Tracking Study

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1. Introduction

As primary providers of health care, physicians are frequently the subjects of surveys to ascertain current practice and perceptions on health care. Since physicians are subject to frequent requests for information, the willingness to respond has declined as the burden has increased. Various authors have published on methods to improve response rates, especially to mail surveys. A recent literature review on these methods was completed by Kellerman and Herold (2001). Another recent paper discussed the impact of survey mode and methods for AMA's Socioeconomic Monitoring System (Thran and Hixson 2001) and suggested a mixed mode (mail with telephone follow-up) as beneficial for surveys requesting practice expenses. In this paper, we discuss factors related to response to repeated interviews (approximately 2 years apart) in the physician survey component of the Community Tracking Study, which is a telephone survey of more than 12,000 physicians. A sample of physicians was interviewed initially in 1996-97 and 10,800 physicians were selected for a second interview in 1998-1999. We have information from the sources files for the samples (as is commonly available), plus information from the initial interview on career satisfaction, income, and other factors that may affect response.

The Community Tracking Study is a comprehensive examination of the nation's health care system funded by the Robert Wood Johnson Foundation and conducted by the Center for Studying Health System Change (HSC). The overall goal of this study is to characterize and track health care from both the perspective of the providers and the general population. To support the study, these two components of the health care system are assessed every two years, on the basis of primary data collection in a national household survey and a national physician survey. The two surveys use the same basic designs to facilitate overall analyses of the health care system. Each design consists of several components, referred to as a 3-tier design. Two independently drawn samples are used: a "site sample" and a national "supplemental sample". Both are valid samples for the 48 coterminous States. The site sample is a two-stage clustered design with 60 primary sampling units (sites), while the supplemental sample is a single stage design. The three tiers refer first to the supplemental survey, and then to the two tiers within the site survey: high-intensity sites (12 sites) and low-intensity sites that differ only in sample size.

The data collection methodology differs somewhat for the household and physician surveys, but both use primarily telephone interviewing. Household telephone numbers are generated by random digit dialing with a small area-based component to represent households without telephones, and the physician survey uses lists of physicians obtained from the American Medical Association (AMA) and American Osteopathic Association (AOA). Telephone numbers are obtained from the lists with additional tracing of missing or incorrect telephone numbers.

The major objectives of the physician survey are (a) to document changes physicians are experiencing in the health care system and (b) to learn how these changes are affecting physicians, their practices and the way they deliver medical care to their patients. The goal is to provide information to public and private leaders that will enable them to make better policy decisions.

In Round Two (R2) as in Round One (R1), a nationally representative sample of physicians was drawn from records maintained by the AMA and the AOA. Consistent with the overall design of the Community Tracking Study, physicians were sampled in 60 randomly selected communities across the United States. A separate random sample of physicians representative of the U.S. was also drawn to permit national tracking with greater precision.

2. Target Population

The target population was based on information provided on the AMA Masterfile (which includes both AMA members and nonmembers) and on the AOA membership file.[1] To meet the initial eligibility

[1]The AMA Masterfile includes licensed allopathic physicians and osteopathic physicians who obtained graduate training in allopathic medical schools or were identified on state licensing boards. The AOA membership file includes graduates of

criteria for sampling, physicians in the frame had to have completed their medical training, practice in a state within the continental United States (excluding Alaska), and provide direct patient care for at least 20 hours per week. Residents, interns, and fellows were considered to be still in training and were excluded from the sample. The direct patient care criterion resulted in the exclusion of inactive physicians and physicians who were not office- or hospital-based (such as teachers, administrators, and researchers). The following types of physicians were designated as ineligible for this survey and were removed from the frame:

- Specialists in fields that do not focus primarily on direct patient care
- Federal employees
- Graduates of foreign medical schools who are licensed only temporarily to practice in the United States

Eligible physicians were then classified as either PCP or specialist. PCPs were defined as physicians with a primary specialty of family practice, general practice, general internal medicine, internal medicine/pediatrics, or general pediatrics. All others with survey-eligible specialties were classified as specialists. The interviewer also verified physician eligibility before continuing with the survey. The attributes that were verified during the interview included whether the physician was a federal employee, whether he or she was a resident or fellow, and whether he or she provides patient care for 20 hours a week or more. Physicians who were eligible based on the AMA or AOA Masterfile data, but were ineligible at the time of the interview, were excluded from the survey as ineligible.

3. Sampling Design

A common feature of longitudinal surveys is the selection of sampling units in one round of a survey for participation in the next round. In this case, physicians are the sampling unit. Including a portion of the physicians who responded to R1 in the R2 sample may increase precision substantially for change estimates and, to a lesser extent, for cross-sectional estimates. At the same time, to ensure complete population coverage in R2 and to minimize respondent burden and conditioning (because repeated contacts may influence survey responses), some proportion of the R1 sample should be replaced to represent physicians who had no chance of selection in prior rounds.

In R1, 14,790 physicians responded (including eligible and ineligible respondents) from a sample of 23,764 physicians. In R2, 15,324 physicians responded from a sample of 25,627 physicians, and of these 25,627 sampled physicians, 10,080 physicians had responded in R1. For R2, Mathematica Policy Research (MPR) designed and selected the sample and performed the tracing of physicians. The Gallup Organization (Gallup) was the data collection contractor for both R1 and R2. For R2, MPR computed the sampling weights and adjusted these weights for failure to locate a physician and for nonresponse among located physicians.

4. Objectives of the Research

Usually for a survey of physicians, the response analysis is based on the characteristics of the physicians gleaned from the sampling frame. These data include age, gender, specialty, location/country of the medical school, practice location and characteristics. We know, however, that some of these data are not current. For the 10,080 physicians who responded in R1 and were selected for R2, we have information from the sampling frame, plus more current and accurate information on the practice characteristics and the physician's income, and we also have attitudinal data. The objectives of this research are to assess the factors affecting response first using data available from the sampling frame and then using both data from the sampling frame and the more current practice data, attitudinal responses and income information from the physicians themselves. This will enable a more complete profile of factors that may be associated with nonresponse.

5. Methods

For list-based surveys like this, we at MPR generally use two sets of weighted logistic regression models to prepare adjustments to the survey weights

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(continued)
osteopathic medical schools. In addition, the AOA file often has current addresses for osteopathic physicians that may not be on the AMA Masterfile.

(1) for locating the sampled person (the physician), and (2) for interview response, defined here as either a completed or ineligible interview. Our perception is that the dynamics related to being able to locate a physician are different than those related to physician response once located. We have found in this and other surveys, that some of the factors significant in explaining the variation in the outcome may be similar in both the location and response models, but other factors are unique to either the location or response. For the R1 physicians selected for R2, we were able to locate approximately 97 percent, so for this analysis we will use only one model that develops response propensity scores to account for both location and response once located. For the statistical analysis, we used the weighted logistic regression in SUDAAN so we could account for the full complexity of the design.

6. Findings

Data Available from the Sampling Frame

As shown in Table 1, the weighted response rate for both primary care physicians (PCPs) and specialists is nearly identical. Similarly, the weighted response rates for male and female physicians are nearly equal. There is, however, a slightly lower, but statistically significant, response rate for female specialists. Among PCPs, these physicians are classified in family and general practice, internal medicine, or pediatrics. With internal medicine as the reference cell, PCPs with a pediatrics specialty and with family or general practice specialty responded at a significantly higher rate. PCPs with a pediatrics specialty responded at a 6 percent higher rate than internists. Further classifying pediatricians by gender indicated that male pediatricians responded at a substantially higher rate (83.5%) than any other PCP physicians or female pediatricians (76.7%). Female PCPs responded at nearly the same rate for all three PCP classifications.

An important factor in the response rate was whether the physician graduated from a medical school in the US or Canada (78.1%) or from a school located elsewhere in the world (72.8%). We have found among physicians who had not been interviewed previously that physicians who graduate from a medical school not in the US and Canada are difficult to locate. This result indicates that among those who can be located more easily, the likelihood of response is significantly lower.

When looking by age classification (Table 1), older physicians (66 or older) were classified as respondents more frequently than the other age classification, and we should note that retired physicians were considered as ineligible respondents. For physicians age 65 years or younger, the response rates on Table 1 exhibit no consistent trend for all physicians, or for male or female physicians.

Data Available from Prior Interview

As described previously, we had available information that was collected from the physician in the prior round of data collection. This information included board certification, full or part ownership of the practice, whether the physician primarily served children, career satisfaction, and income. We incorporated these factors into the model that included the frame data found significant to assess the additional explanatory ability of the respondent-provided information. We found that board certification (77.9% vs. 74.9%) and whether the physician primarily served children (79.0% VS. 76.5%) were associated with higher response rates, whereas full or part ownership of the practice exhibited significantly lower response rates (76.2% VS. 78.8%). It is interesting to note that the model using the frame data included the factor of pediatricians, and when the factor indicating whether the physician primarily served children was also included in the model, both factors were significant. This seems to imply that, although conceptually identical, whether the physician primarily served children explained some part of the response rate variation that was not accounted for the classification of a physician as a pediatrician, and the significance of the latter factor was not diminished.

In tables 2 and 3, we present weighted response rates by career satisfaction and income by gender (Table 2) and by PCP/specialist classification (Table 3). Response rates globally increase with increasing career satisfaction and this is generally true for male physicians and specialists. For female physicians and PCPs, the response rate pattern is not consistent and, moreover, female physicians tend to respond at the same rate for all levels of career satisfaction. For reported income, the global response rates decrease with increasing income. Again, this pattern exists for male physicians, but not for female physicians, primary care physicians or specialists.

7. Discussion

The physician survey component of the Community Tracking Study offered the relatively unique situation of investigation factors associated with response when physicians are interviewed at two-year intervals. Nearly all of the physicians (97%) were located and 77.2 percent responded (including eligible and ineligible respondents in RD2, but all physicians were classified as eligible respondents in RD1). The classification of the

physicians based on frame data as primary care physicians or specialists had nearly identical response rates, as did male and female physicians. Primary care physicians who were classified as pediatricians responded at a rate of 80% and male pediatricians responded at a rate of 83.5%. Female physicians tended to respond at nearly identical rates except for female specialists who exhibited a slightly lower response rate (75%). In addition the location of the medical school was a significant factor.

When using information collected during the prior interview, board certification, ownership and whether the physician served children were significant factors in explaining the response rate. Career satisfaction was also a significant factor with increasing response with increasing satisfaction. However, this pattern was not consistent for PCPs or specialists or for female physicians. Similarly, the response rate decreased with increasing income, but again this was not consistent for female physicians and for PCPs or specialists.

Our analysis indicates that most of the factors expected to explain the variation in the response rates actually do so when physicians are reinterviewed at a two-year interval. However, various interactions may exist and these should be accounted for in the nonresponse adjustments.

References

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TABLE 1. RESPONSE RATE BY PATIENT CARE CLASSIFICATION AND AGE: OVERALL AND BY GENDER

			Male		Female	
	Sample	Weighted Response Rate	Sample	Weighted Response Rate	Sample	Weighted Response Rate
All	10,080	77.2	8,000	77.4	2,080	76.2
Patient Care Classification						
Primary Care Physician	5,381	77.2	4,363	77.0	1,468	77.7
Family/General Practice	2,647	77.5	2,233	77.2	347	79.3
Internal Medicine	1,868	74.4	1,483	73.6	385	77.7
Pediatrics	1,316	80.5	739	83.5	577	76.7
Specialist	4,249	77.2	3,637	77.6	612	74.9
Surgery	862	76.8	825	76.8	37	76.7
Psychiatry	461	78.7	342	79.5	119	76.3
Other	2,926	77.1	1,044	77.9	281	73.4
Age						
Less than 45	2,936	74.6	2,019	74.7	917	74.2
46-55	3,848	77.4	3,027	77.3	642	77.9
56-65	1,932	76.2	1,680	76.7	252	72.2
66 or older	1,364	83.6	1,274	83.2	90	87.7

TABLE 2. RESPONSE RATE BY CAREER SATISFACTION AND INCOME: OVERALL AND BY GENDER

			Male		Female	
	Sample	Weighted Response Rate	Sample	Weighted Response Rate	Sample	Weighted Response Rate
All	10,080	77.2	8,000	77.4	2,080	76.2
Career Satisfaction						
Very Satisfied	4,265	78.8	3,368	78.6	897	77.9
Somewhat Satisfied	3,847	77.0	3,019	77.2	828	76.0
Neither	175	71.6	145	72.3	30	66.3
Somewhat Dissatisfied	1,354	74.6	1,088	75.3	266	71.5
Very Dissatisfied	439	72.9	380	72.5	59	76.0
Income						
Less than $100,000	2,258	78.0	1,339	78.2	919	77.6
$100,000-$150,000	3,210	77.6	2,465	78.4	745	74.7
$150,000-$250,000	3,104	77.9	2,774	77.7	330	79.5
More than $250,000	1,508	74.8	1,422	75.4	86	63.3

TABLE 3. RESPONSE RATE BY CAREER SATISFACTION AND INCOME: OVERALL AND BY PATIENT CARE CLASSIFICATION

			Primary Care Physician		Specialist	
	Sample	Weighted Response Rate	Sample	Weighted Response Rate	Sample	Weighted Response Rate
All	10,080	77.2	5,831	77.2	4,249	77.2
Career Satisfaction						
Very Satisfied	4,265	78.8	2,421	79.2	1,844	78.5
Somewhat Satisfied	3,847	77.0	2,273	75.6	1,574	77.8
Neither	175	71.6	102	59.8	73	77.6
Somewhat Dissatisfied	1,354	74.6	791	78.9	563	72.3
Very Dissatisfied	439	72.9	244	71.3	195	73.7
Income						
Less than $100,000	2,258	78.0	1,627	79.4	631	76.6
$100,000-$150,000	3,210	77.6	2,304	76.0	906	79.2
$150,000-$250,000	3,104	77.9	1,564	78.5	1,540	77.7
More than $250,000	1,508	74.8	336	68.5	1,172	75.5

Source of tables – Mathematica Policy Research Survey Data Files Combined with AMA/AOA frame information.