

## CHARACTERISTICS OF UNLOCATABLE PHYSICIANS

Sara L. Thran, Martin L. Gonzalez, American Medical Association  
Sara L. Thran, AMA, 515 N. State Street, Chicago, IL 60610

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### I. Introduction

The American Medical Association (AMA)'s Socioeconomic Monitoring System (SMS) is an ongoing annual survey of nonfederal patient care physicians. Data are collected on medical practice characteristics such as hours worked, number of patient visits, managed care participation, fees, practice income and expenses. SMS is administered using computer assisted telephone interviewing (CATI). The AMA contracts with an independent survey firm for data collection. Mathematica Policy Research (MPR) conducted the surveys between 1981 and 1991. RAND conducted the surveys between 1992 and 1997 and Westat conducted the 1998 survey. The 1999 survey is being conducted by MPR.

SMS response rates have declined from over 72% in 1989 to slightly over 50% in 1998.<sup>1</sup> Contributing to this decline is the increase in the proportion of sample members who are not contacted because of the lack of a telephone number; such cases are referred to in this paper as physicians who are not located. Steadily increasing over the last few years, this proportion reached 14% in 1998. The SMS response rate calculation treats physicians without working telephone numbers as nonrespondents.

Probably the greatest contributor to the problem of having accurate telephone numbers for physicians is the decline in AMA membership; the AMA's records are more current for physicians who are members. Rapid changes in physician practice arrangements and the health care delivery system, e.g. trends toward employment and increasing practice size, have contributed to declining survey response rates and may also have contributed to the number of physicians with inaccurate and missing telephone numbers.

Data from the 1996-1998 SMS surveys are used to examine the characteristics of physicians in the sample for whom we did not have good telephone

numbers. Logistic regression results, with the dichotomous dependent variable indicating whether a telephone number was available, are presented.

### II. Survey Description

The first Socioeconomic Monitoring System (SMS) survey was conducted in the autumn of 1981. The survey was conducted quarterly through 1985, then semi-annually through 1991, and annually since then. The current annual SMS survey was considered the "Core" survey in years when the survey was conducted quarterly and semi-annually. The current survey, like past "Core" surveys, is conducted in the spring/summer and typically yields responses from about 4000 physicians. The Core survey field period is about 5 months and the survey interview lasts about 25 minutes. The non-Core surveys conducted between 1981 and 1991 were shorter in length, had shorter field periods, and had fewer respondents.

The SMS uses a random sample of nonfederal patient care physicians drawn from the AMA Physician Masterfile. The Masterfile contains current and historical information on all allopathic physicians in the United States, including members and non-members of the AMA. Masterfile data are obtained from primary sources, including medical schools, physician organizations and healthcare institutions. The only Masterfile information obtained directly from individual physicians concerns current professional activities and preferred mailing addresses; questionnaires to obtain these data are sent on a quadrennial basis to the entire United States physician population. The Masterfile is continuously updated with changes in address or professional status; these changes may be signaled by input from professional organizations, AMA mailings, or by physician correspondence.

Residents and clinical fellows are excluded from the SMS sample. The SMS survey includes screening questions to determine eligibility; physicians who indicate that they spend less than 20 hours per week in patient care or who are federal employees are not interviewed. In order to provide reliable estimates of short-term changes in certain indicators, the SMS survey includes a panel component consisting of a portion of the sample who had responded to the SMS survey the previous year. Approximately one-third of the completed interviews are conducted as reinterviews with physicians who had responded to the SMS survey the previous year.

<sup>1</sup> SMS response rates were typically around 62% until 1987 when the rate increased to almost 67%. The highest response rate, about 72%, was achieved in 1989. Since then the rate has declined from 69% in 1990 to 63% in 1994. The rate dipped below 60% for the first time in 1995 (58.7%) but got up above 60% in 1996 and 1997.

An analysis of the SMS survey respondents conducted in 1986 found that the SMS respondents differed from the eligible population in systematic ways. A weighting scheme designed to adjust for nonresponse was developed and has been used since then. The weights incorporate the main characteristics found to influence the probability of survey response. These factors are membership in the AMA, board certification status, specialty, and years of practice experience. Because a certain percentage of the SMS sample are found to be ineligible, an eligibility factor is also incorporated into the weights.

Field procedures developed for SMS reflect a complex effort to minimize nonresponse bias and to accommodate the busy schedules of physicians through advance preparation and intensive follow-up efforts to complete interviews. Prior to data collection, advance packets are sent to each physician in the sample. A number of efforts have been implemented over time to ensure a high response rate:

- Interviews are scheduled at the convenience of physicians.
- A toll-free number is provided, allowing physicians to complete the interview at their convenience.
- In some years, mail questionnaires, tailored to each specialty, have been made available to physicians who indicate a preference for responding to the survey in writing.
- Repeated callbacks to nonrespondents are made before abandoning efforts to interview the physician.
- Letters encouraging participation and addressing specific objections are sent to physicians who initially refuse to be interviewed.
- Refusal conversion attempts are made by a select group of interviewers.
- The physician may name a proxy respondent to complete some or all of the interview.

Since inadequate coverage is a potential problem for telephone surveys, the survey contractor expends considerable effort to locate sample physicians. If the Masterfile telephone or address information is incomplete or incorrect, basic sources of updated information used are directory assistance, state and county medical societies, state licensing boards, and hospitals.

### III. Motivation

Given the increasing number of physicians who cannot be located as well as the increased effort needed for tracing physicians, it is important to understand the characteristics of physicians who cannot be located. If the probability of locating

physicians is unrelated to characteristics that determine the probability of survey response, then physicians who cannot be located may not be contributing to nonresponse bias. If that is the case then making a stronger effort to locate these physicians would increase the response rate but not necessarily impact nonresponse bias. However, if these physicians systematically differ from survey respondents it is even more critical to increase efforts to find them.

A second purpose of this analysis is to guide efforts to improve the ability to locate physicians. It will be helpful to know the characteristics that best describe physicians who are not located<sup>2</sup>.

### IV. Results

As seen in Table 1, the proportion of physicians in the sample who could not be located increased from 9.5% in 1996 to 13.8% in 1998. This contributed to the decline in survey response rates during that same time.

The SMS survey response rate has been defined as the number of completed interviews divided by the number of sample cases minus the ineligible cases. A conservative change in the estimation would be to assume that the nonlocated physicians are eligible for the survey at the same rate as those who are located. Adjusted response rates are shown in Table 1.

Demographic characteristics which are available on the Masterfile were compared for physicians who were located and those who were not located. This univariate analysis is not presented in the tables. Significant differences were found for each characteristic examined. For example, physicians who could not be located were comprised of more:

- Nonmembers of the AMA, 80.8% compared with 63.8% of the entire sample;
- Physicians who are not certified, 33.6% compared with 20.4% of the entire sample;
- Physicians under the age of 40, 31.9% compared with 19.5% of the entire sample; and
- Female physicians, 31.1% compared with 18.3% of the entire sample.

All these differences were in the direction expected. The distribution of nonlocated physicians by specialty was similar to that of the entire sample with a few exceptions. Surgeons comprised 19.9% of the entire sample but just 10.6% of physicians who could not be located. Anesthesiologists comprised 5.4% of the entire sample compared with 8.2% of physicians

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<sup>2</sup> The tracing procedures are being expanded in the 1999 survey; when the 1999 initial sample was drawn, telephone numbers were missing for over half of the cases. This was due to recent changes in AMA's procedures for maintaining the files – telephone numbers are included only if they are known to be current office numbers.

who could not be located. Similar results were found for each of the individual years as for the 3 years combined.

Next, we conducted a multivariate analysis. Table 2 reports odds ratios for the explanatory variables from the logistic regression for “locatability.” The dependent variable has a value of 1 if a telephone number was found (and the physician was contacted) for the physician and 0 otherwise. The explanatory variables included age and the square of that value as well as dichotomous variables for survey year. The reference category is: general/family practice, office-based, New England, rural, male, U.S. medical graduate, not board certified, AMA non-members in the 1998 survey. These explanatory variables are jointly significant in predicting the probability of a physician being located. An odds ratio of greater than 1 indicates a positive relationship between the characteristic and locatability.

The major characteristics that differentiate physicians who could not be located from the entire sample seen in the univariate analysis were also found to be related to the probability of being located in the multivariate analysis. For example, board certified physicians, AMA members, graduates of U.S. medical schools, and male physicians were more likely to be located than their counterparts.

#### V. Discussion

This analysis has raised a number of concerns. First, more information is needed on the impact of nonlocatability on survey estimates. Nonlocatability appears to be related to physician mobility; if we are not surveying the more mobile physicians, we may not be getting accurate information on the state of medical practice. Thus, we plan to enhance our efforts to locate and survey a sample of the

nonlocatable physicians so that we can see how their survey responses differ from other survey respondents. Mail surveys could be sent to physicians for whom we have address information but are missing telephone information; this seems to be a reasonable, low-cost option worth pursuing. In addition, expensive tracing could be done on a sample of cases; Web-based searches as well as credit bureau searches have been useful in other physician surveys, but they are quite costly.

Currently, nonlocatable physicians are treated as nonrespondents in the weighting and response rate calculations. Further examination is necessary to determine whether this is appropriate. Survey weights may need to be adjusted. Response rate calculations probably will change.

#### VI. Conclusion

The changing medical marketplace has made it more difficult to maintain current and complete records on practicing physicians. As a result, increased efforts are required to find working telephone numbers for physicians included in a sample. This analysis indicates that the probability of ultimately locating a physician by telephone is nonrandom. In addition, some of the factors that were found to influence the probability of locating a physician also influence the probability that a located physician will respond to the survey. For example, over 80% of physicians who could not be located were not members of the AMA. Nonmembers who we are able to contact are less likely than members to respond to the SMS survey. Thus, while increasing efforts to locate physicians may result in more physicians being contacted it may not result in higher survey response rates.

Table 1  
Response Rate Calculation – Entire Sample

	<u>1996</u>	<u>1997</u>	<u>1998</u>
Sample Size	7419	7273	8159
Not found	704 (9.5%)	790 (10.9%)	1129 (13.8%)
Ineligible	784 (10.6%)	804 (11.1%)	827 (10.5%)
Survey Response Rate	60.4%	61.1%	52.2%
Adjusted Response Rate <sup>+</sup>	61.1%	62.0%	53.0%

<sup>+</sup>Assuming physicians who are not found have the same eligibility rate as the remainder of the sample.

Table 2  
 Logistic Regression Results – Locatability  
 1996-98 Combined

	<u>Odds Ratio</u>
Intercept	0.012
Board Certified	1.776***
Middle Atlantic	1.023
East North Central	1.070
West North Central	1.445**
South Atlantic	1.024
East South Central	1.165
West South Central	0.944
Mountain	0.930
Pacific	0.699***
Hospital Based Practice	0.848*
Physician Age	1.249***
Physician Age Squared	0.998***
1997 Survey	1.304***
1996 Survey	1.508***
Internal Medicine	1.210*
Surgery	1.566***
Pediatrics	1.212*
Obstetrics/Gynecology	1.148
Radiology	0.801*
Psychology	0.796*
Anesthesiology	0.681***
Pathology	0.728*
Other	0.748***
Female	0.593***
International Medical Graduate	0.689***
AMA Member	2.225***
Located in Small Metropolitan Area	0.949
Located in Large Metropolitan Area	0.706***

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\*p<0.05  
 \*\*p<0.01  
 \*\*\*p<0.001