

Survey Methods for a New Mail Survey of Office-Based Physicians¹

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Abstract

The National Ambulatory Medical Care Survey (NAMCS) is a survey of office-based physicians that gathers information about physicians and their practices through in-person interviews. The Office of the National Coordinator (ONC) for Health Information Technology requested information about the use of electronic medical records based on a larger sample of physicians than the one used in NAMCS. For that purpose a mail survey was initiated in 2008 on supplemental physician samples. At the close of planned data collection for the 2008 mail survey, eligibility status for the survey was determined for fewer than 60 percent of the sample. To improve results, a follow-up survey was conducted on a subsample of those whose eligibility status was not determined in the initial effort. This paper discusses the methods and results for the 2008 mail survey and changes made to data collection methods to the mail survey for 2009 and subsequent years.

Key Words: Survey methods, Multi-mode, Non-response, Physician survey

1. Introduction

The National Ambulatory Medical Care Survey (NAMCS) conducted by the National Center for Health Statistics (NCHS) is an annual nationally representative sample survey of office-based physician/patient encounters which also collects information about the physicians' practices. The physician universe targeted in NAMCS consists of non-Federally employed office-based physicians in the 50 states and the District of Columbia who are less than 85 years of age. Physicians specializing in anesthesiology, radiology, and pathology are excluded. The physician sampling frame is compiled from databases of office-based physicians obtained from the American Medical Association (AMA) and the American Osteopathic Association. For the core NAMCS, a stratified area sample of about 3,000 or more physicians are selected annually with strata defined by 15 or more physician specialty groups. The sample areas are counties or groups of counties (townships in New England). The sample physicians are randomly distributed to the 52 weeks of the year for reporting on their patient visits. Trained field representatives from the U.S. Census Bureau conduct in-person interviews to collect the core NAMCS data.

NAMCS began monitoring the use of electronic medical record (EMR) systems in 2001. Starting in 2005, questions were added to ask about the presence and use of specific EMR system features, namely computerized prescription orders, computerized test orders,

¹ The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the National Center for Health Statistics or the Centers for Disease Control and Prevention.

reporting test results (lab or imaging), and clinical notes (Hing, et al., 2007). In 2008, a mail survey of physicians was initiated in order to increase the number of respondents to questions about their use of EMRs. Preliminary 2008 estimates of EMR use were released in 2008 from the mail survey while final estimates were produced later by combining the data from both the mail and the core NAMCS. (Hsiao et al., 2008; Hsiao et al., 2009). The discussion in the remainder of this paper is restricted to the mail survey. Section 2 discusses the methods for the mail survey and the results of the initial efforts for the mail survey. Section 3 discusses a follow-up survey conducted on samples of the non-respondents to the initial mail survey efforts. Section 4 discusses the final 2008 survey results and survey weight adjustments made to account for non-response. Section 5 briefly outlines the changes made in methods for conducting the mail survey in 2009 and subsequent years while a summary is given in the last section.

2. Mail Survey

2.1 Survey Design

Except for sample size, the sampling design for the 2008 mail survey was identical to that of the core NAMCS. A sample of 2,000 physicians was selected in addition to those for the core NAMCS sample. Each physician in the mail survey sample was sent up to three mail questionnaires and one reminder or thank-you postcard with at least two weeks between questionnaire mailings. After about two weeks following the third mailing, up to 6 telephone calls were attempted to physicians who had not returned a “completed” questionnaire. When the physician contact information obtained from the sampling frame was incorrect or insufficient, the “WebMDphysiciandirectory” at http://doctor.webmd.com/physician_finder/home.aspx?sponsor=core was searched in an attempt to obtain additional information on addresses and/or telephone numbers. The planned data collection started in April of 2008 and ended in August 2008.

The items in the mailed questionnaire were adapted from the physician induction interviews for the core NAMCS. Included items were about physician eligibility information for NAMCS, about availability and use of EMRs, and about other characteristics of the practice location where the sample physicians saw the most ambulatory care patients. The full questionnaire for the 2008 mail survey may be viewed at <http://www.cdc.gov/nchs/data/ahcd/EMR-NAMCS-011608webversion.pdf>. Seven key items referenced in the following are shown in Figure 1.

Each physician in the sample was considered to be a final respondent to the mail survey if three criteria were met: (A) the physician was eligible for NAMCS, (B) a response to item 17 on whether EMRs were used in the physician’s practice was provided, and (C) a response to at least two of the four other “key items” (items 11, 13, 14, and 15) in the mail questionnaire was provided. Being eligible for NAMCS required that the physician currently both cares for ambulatory patients (“yes” response to item 2) and cares for patients in an office-based setting (any of the odd-numbered response options for item 7).

2.2. Results of Initial (Planned) Data Collection

At the close of planned data collection in August 2008, eligibility status was determined for 1,162 physicians, which left 838 (41.9 percent of sample cases) for which eligibility status remained unknown. Of the 1,162 physicians, 834 (71.8 percent) were found to be NAMCS eligible, of which 819 (98.2 percent of 834) met the criteria for respondent status and the remaining 328 (28.2 percent) were found to be ineligible.

2. Do you directly care for any ambulatory patients in your work?

7. Please select the type of setting where you have the most ambulatory care visits. Check one.

<input type="checkbox"/> 1 Private solo or group practice	<input type="checkbox"/> 2 Hospital emergency department
<input type="checkbox"/> 3 Freestanding clinic/urgicenter (not part of a hospital outpatient department)	<input type="checkbox"/> 4 Hospital outpatient department
<input type="checkbox"/> 5 Community Health Center (e.g. Federally Qualified Health Center (FQHC), federally funded clinics or "look alike" clinics)	<input type="checkbox"/> 6 Ambulatory surgicenter
<input type="checkbox"/> 7 Mental Health Center	<input type="checkbox"/> 8 Institutional setting (school infirmary, nursing home, prison)
<input type="checkbox"/> 9 Non-federal Government clinic (e.g. state, county, city, maternal and child health, etc.)	<input type="checkbox"/> 10 Industrial outpatient facility
<input type="checkbox"/> 11 Family planning clinic (including Planned Parenthood)	<input type="checkbox"/> 12 Federal Government operated clinic (e.g., VA, military, etc.)
<input type="checkbox"/> 13 Health maintenance organization or other prepaid practice (e.g., Kaiser Permanente)	<input type="checkbox"/> 14 Laser vision surgery
<input type="checkbox"/> 15 Faculty Practice Plan	

For the remaining questions, please answer as it applies to the location where you see the most ambulatory care patients even if it is not the location where this survey was sent.

11. How many physicians are associated with you at this location?

13. How many mid-level providers (i.e., nurse practitioners, physician assistants, and nurse midwives) are associated with this practice?

14. Are you a full- or part-owner, employee, or an independent contractor? CHECK ONE.

<input type="checkbox"/> 1 Owner (full or part)
<input type="checkbox"/> 2 Employee
<input type="checkbox"/> 3 Contractor

15. Who owns this practice? CHECK ONE.

<input type="checkbox"/> 1 Physician or Physician Group	<input type="checkbox"/> 5 Other hospital
<input type="checkbox"/> 2 HMO	<input type="checkbox"/> 6 Other health care corp
<input type="checkbox"/> 3 Community Health Center	<input type="checkbox"/> 7 Other
<input type="checkbox"/> 4 Medical/ Academic health center	

17. Does this practice use electronic MEDICAL RECORDS (not including billing records)?

<input type="checkbox"/> 1 Yes, all electronic
<input type="checkbox"/> 2 Yes, part paper and part electronic
<input type="checkbox"/> 3 No
<input type="checkbox"/> 4 Don't know

Figure 1: Key items from the 2008 mail survey questionnaire.

Because of the low rate at which eligibility status for NAMCS had been determined by the end of the planned data collection in August 2008, a follow-up survey was conducted in September and October 2008 on subsamples of those for whom eligibility remained unknown. The discussion in the next section is about that follow-up survey.

3. Follow-Up Survey

3.1 Methods

The sample physicians whose eligibility status was unknown at the end of the planned data collection were classified into two groups on the basis of the reason for their unknown eligibility status:

- Physicians were classified as refusals if they returned a form without completing eligibility questions or if they refused to answer eligibility questions when they were contacted by phone. Other non-responding physicians were also classified as refusals if their phone numbers were confirmed to still reach the physician or physician's office when called or if no mailed questionnaires were returned as undeliverable by the post office. These non-responding physicians were assumed to have received one or more of the mailed questionnaires or survey phone calls and, hence, had an opportunity to respond to the survey. There were 429 (21.5 percent of 2000) in the refusal class.
- Physicians were classified as non-locatables if their contact information could not be confirmed accurate or if the contact information provided by AMA was inadequate but the needed additional information on addresses or telephone numbers was not found in WebMD. There were 410 (20.5 percent of 2000) non-locatables.

Three simple random samples were selected for the follow-up survey. One sample of 200 was selected from the refusals and two samples of 100 each were selected from the non-locatables. The follow-up on one of the non-locatable samples was conducted by in-person interview to collect data for all items in the mail questionnaire. The interviewers for this follow-up were Census Bureau trained field representatives who conducted in-person interviews with sample physicians for the core NAMCS. NCHS staff conducted the follow-up of the remaining two samples (total 300 cases) by telephone and collected only the data for questionnaire items 2 and 7, (about NAMCS eligibility) and item 17 (about EMR usage). No attempt was made in the telephone follow-up to collect data for the remaining items in the mail questionnaire. Also during the telephone follow-up, information for items 7 and 17 were requested for the location where the physician was reached instead of the location where the physician saw the most ambulatory visits (the location specified in the mail questionnaire).

For the telephone follow-up of the 100 physicians in the non-locatable sample, the web search for contact information was expanded to additional websites (listed in Table 1). Google was also searched for the names, specialties and city/states of physicians not found in the expanded list of websites. New contact information was found for 53 of the sample physicians but that information was correct for only 33 of them (those enumerated in Table 1). However, even when the new information was incorrect, some contacted receptionists provided more current information (such as, retired, went into consulting, moved to another state) when asked if they knew anything about the physician being sought. The information obtained from such contacts was also used in further efforts to locate that physician.

3.2. Results of the Follow-Up Survey

Table 2 presents the numbers of sample physicians responding by initial survey response and follow-up status. NAMCS eligibility status was determined for 70.5 percent of all the follow-up survey sample physicians. Eligibility status was determined for 85.5 percent of the refusal sample and of these, 93.6 percent were found to be eligible. For the non-locatable samples, follow-up by personal interview resulted in determining the eligibility status about 2.5 times as often as did the telephone follow-up (80.0 percent versus 31.0 percent). Despite the disparity in rates of determining eligibility status between non-locatable samples, the numbers of physicians found to be eligible was about the same between the two samples (24 physicians via personal interview and 23 physicians via telephone), leading to different percents of eligibles among those whose eligibility status was determined (30.0 percent and 74.2 percent, respectively).

Among the 207 physicians found to be eligible in the follow-up survey, 78.3 percent responded to the questionnaire item 17 about EMR usage. The rates of response to item 17 varied by follow-up sample. Responses to item 17 were obtained from 100.0 percent and 87.0 percent of the those found eligible in the personal interview and phone follow-up non-locatable samples, respectively, and 73.8 percent of those found eligible in the refusal sample.

Among the 24 physicians found eligible in the non-locatable sample followed up by personal interview, 23 satisfied the conditions for being deemed a respondent. No one in the remaining follow-up survey samples could be deemed a respondent because they were followed up by telephone. Determination of respondent status for the survey required responses to at least two of the four items 11, 13, 14, and 15, but data for those four items were not collected in the telephone follow-up.

4. Final Combined 2008 Initial Mail and Follow-Up Surveys

4.1 Final Combined Response Rates

As a result of the combined initial mail and follow-up survey efforts, eligibility status for NAMCS was determined for 72.2 percent of the 2000 physicians in the 2008 mail survey sample. Of these, 72.1 percent were eligible and 80.9 percent of the eligible physicians were deemed final respondents (Table 2). The final mail survey response rates were calculated according to the guidelines specified by the Office of Management and Budget (OMB, 2006). The denominator of the response rate was the sum of estimated numbers of eligible physicians across specialty group sampling strata. Estimates of eligible physicians summed: (1) the number of physicians found eligible at the end of the original survey (by end of August 2008), (2) the estimated number of eligible non-locatable physicians, and (3) the estimated number of eligible refusal physicians.

For the non-locatables, the estimated number of eligible physicians was the sum of the number of non-locatables found eligible in the follow-up survey and an estimate of the number of eligibles among those who remained non-locatable after the follow-up survey. That estimate was the product of the number of remaining non-locatables with unknown eligibility status times the percent of non-locatables found eligible among those whose eligibility status was determined in the follow-up survey. The method for estimating the number of refusals was identical to that for estimating the number of eligible non-locatables except numbers of refusals were substituted for the numbers of non-locatables. For simplicity and to conserve space, information in Table 2 ignored differences in

response by physician specialty group sampling strata. The resulting final weighted and unweighted response rates for the 2008 mail survey were both about 62 percent (not shown).

4.2 Weight Adjustments for Unit Non-Response

In addition to the usual adjustments made for unit non-response in the core NAMCS, mail survey weights require adjustment for lack of information about NAMCS eligibility for some non-respondents. Such adjustments are NOT required in the core NAMCS because the Census field representatives are required to determine NAMCS eligibility status for all sample physicians, even those who refuse to participate in NAMCS. The core NAMCS sample physicians who cannot be located by the representatives are usually deemed out-of-scope under the assumption that physicians who cannot be located by the Census representatives are probably not in the business of seeing patients (as required for NAMCS eligibility) because patients would also have to be able to find the physician. Such an assumption was not made for the telephone follow-up because persons on site in/near a physician's location may have access to resources for locating that are not available to persons away from that site (i.e. by telephone from a different area).

The adjustment for unit non-response in the 2008 mail survey was done in three steps within each physician specialty group stratum. The adjustments were based on the assumption that those who did not participate in the survey were probably more like the participants in the follow-up survey than those who participated in the initial survey. The first adjustment step consisted of shifting the sampling weights of sample physicians whose eligibility status remained unknown to those physicians whose eligibility status was obtained during the follow-up survey. The second step consisted of shifting weights from the eligible physicians who did not answer item 17 (about EMR use) to the eligible physicians who did answer item 17. The third adjustment was done within substrata defined by response to item 17 (yes, no) and consisted of shifting the weights of non-respondents (did not respond to at least two of the four items 11, 13, 14, and 15) to physicians who were deemed respondents. If the specialty group stratum also had respondents in the follow-up survey conducted via personal interview, the substrata for the third adjustment were further defined by whether the physician participated in the initial or the follow-up survey. (Five of the 15 specialty group strata did not have any follow-up survey participants who were also deemed respondents.)

5. Mail Survey After 2008

Mail surveys of office-based physicians were also conducted in 2009 and 2010. Lessons learned during the conduct of the follow-up survey on non-respondents to the 2008 initial survey efforts were applied in the later surveys. In particular, web searches were expanded to Google and other references in addition to WebMD when contact information in the physician sampling frame was inadequate. Information regarding eligibility status for NAMCS from proxy sources was also accepted for physicians who were located but refused to respond to the survey. As a result of using the increased resources, the final unweighted and weighted response rates (calculated according to the 2006 OMB guidelines) for the 2009 mail survey were both about 72 percent. (Rechtsteiner, 2010). Results from the 2010 survey were not available at this writing.

6. Summary

Mail surveys were successfully conducted in 2008 and 2009 to collect data on use of electronic medical record systems in office-based physician practices. The initial results in 2008 had a final weighted response rate of only 62 percent largely due to inadequate physician contact information. Expansion of web searches to Google and other references to locate non-respondents led to improved weighted response rates of about 72 percent in 2009.

In addition to supplementing core NAMCS samples of physicians who are asked questions about EMR use, the mail surveys have also permitted preliminary estimates to be available some months before results are available from the core NAMCS.

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Table 1: Number of “Non-Locatable” Physicians Located from Different Websites:
Telephone Follow-Up Sample of 100 “Non-Locatable” Physicians

<i>Website used</i>	<i>Number of physicians located</i>
All	33
Medicare provider directory	20
Ucomparehealth	5
Healthgrades	2
AMA	3
Google	3

Table 2: Number and Percent of Sample Physicians by Initial Response and Follow-up Status: 2008 Mail Survey¹

<i>Initial response and follow-up status</i>	<i>Total</i>	<i>Eligibility status Determined</i>		<i>Found eligible if eligibility status was determined</i>		<i>If found eligible, answered EMR use item</i>		<i>If found eligible, deemed respondent</i>	
		<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
<i>1</i>	<i>2</i>	<i>3</i>	<i>4=</i> <i>col.3/col.2</i>	<i>5</i>	<i>6=</i> <i>col.5/col.3</i>	<i>7</i>	<i>8=</i> <i>col.7/col.5</i>	<i>9</i>	<i>10=</i> <i>col.9/col.5</i>
All initial	2,000	1,162	58.1	834	71.8	819	98.2	819	98.2
Eligibility status was:									
Obtained	1,162	1,162	58.1	834	71.8	819	98.2	819	98.2
Not obtained	838								
Refusal	428								
Non-locatable	410								
Follow-up total	400	282	70.5	207	73.4	162	78.3	23	11.1
Refusal/telephone follow-up	200	171	85.5	160	93.6	118	73.8	0	0.0
Non-locatable	200	111	55.6	47	42.3	44	93.6	23	48.9
/ interview follow-up	100	80	80.0	24	30.0	24	100.0	23	95.8
/ telephone follow-up	100	31	31.0	23	74.2	20	87.0	0	0.0
All final	2,000	1,444	72.2	1,041	72.1	981	94.2	842	80.9

¹ For simplicity and to conserve space, **numbers shown in this table are for the total sample only and do not reflect variations in results by the physician specialty group sampling strata actually used in calculating weights and response rates.**