

The Efficiencies of Fax in Surveys of Clinical Establishments: Observations from a Multi-Mode Survey of Ambulatory Surgery Centers

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Abstract

Surveys of clinical/medical establishments have many known data collection challenges including gatekeepers, time constraints, and lack of interest in surveys, which contribute to higher nonresponse rates than surveys of the general public (Flanigan, McFarlane, & Cook, 2008). Researchers are always looking for creative methods to improve response rates of such surveys while maintaining efficiency and controlling costs. One approach to overcome these challenges and maximize clinician response rate is to offer the survey by fax. However, only a small number of studies on the use of fax for surveys of clinical establishments have been published.

In this paper, we present the results from a multi-mode survey designed to collect data about infection control practices at Ambulatory Surgery Centers (ASCs) in Los Angeles County, California. The observational study assessed survey mode preferences and response rates for surveys administered by fax compared with more traditional modes (phone, web, and mail), as well as the effect of a follow-up approach to convert nonrespondents from non-fax survey modes to fax. We also investigated the relative efficiency of fax, including time and cost savings, compared with other modes used in this study.

Further, we explore the rates at which clinicians and staff opted for fax during the first contact by telephone and the rates of converting to fax during non-response follow-up. We discuss the operational pros and cons of using fax as a method to survey clinical/medical establishments and highlight the potential for cost and time savings.

Key Words: Clinical/medical establishment survey, fax technology, health care provider survey

1. Introduction

Surveys of health care providers have typically been characterized by low or declining response rates as compared to surveys of the general public (Cho, Johnson, & VanGeest, 2013). Previous studies have uncovered a number of challenges that hinder opportunities to achieve high response rates (RR) among health care providers. Commonly cited reasons for low response include time constraints and competing demands of clinical

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staff, physician and clinic gatekeepers (e.g., front desk staff, phone operators, office managers), and a low perceived value of completing the survey (VanGeest, Johnson, & Welch, 2007; Flanigan, McFarlane, & Cook, 2008).

Surveys administered at the establishment level (e.g., to collect information about the health care practice or facility) face additional challenges that further reduce RR. This is because rather than administering the survey to a known individual, the organization, more generally, is being asked to respond, and this may necessitate input from more than one individual or review of business records (Dillman, Smyth, & Christian, 2009). There may also be organizational-level policies that prevent health care providers and staff from participating in surveys. Furthermore, survey sponsors are increasingly looking to minimize costs while achieving high response in a short period a time. Limited data collection time and available resources create even further challenges to obtaining response from this hard-to-reach population.

One strategy to improve response in surveys of clinical establishments may be to offer the survey by fax—a common mode of communication within medical practices and health care facilities. Research suggests that design-based strategies such as the mode of data collection can impact response rate in this population (VanGeest et al., 2007). However, few studies investigating the use of fax in surveys of health care providers or clinical establishments have been published to date. Although there is little published in the recent literature, there is some evidence that health care providers may be receptive to surveys by fax (Ahlers-Schmidt, Chesser, Hart, Jones, Williams, & Wittler, 2010; Lensing, Gillaspay, Simpson, Jones, James, & Smith, 2000; McMahon, Iwamoto, Massoudi, Yusuf, Stevenson, David, Chu, & Pickering, 2003).

In the summer of 2015, a survey of ambulatory surgery centers (ASCs) in Los Angeles County, California was conducted. ASCs are outpatient medical facilities where same-day surgical procedures are performed. The project aimed to collect information on infection control practices, policies, and training, as well as facility characteristics. In an effort to maximize response rate to the voluntary survey over a short field period, the survey was offered by phone, web, postal mail, and fax. Through the fielding of this survey, we assessed mode preference and response rate for surveys administered by fax compared with more traditional modes (i.e., phone, web, and mail), and investigated the relative efficiency of fax, including time and cost savings.

2. Methods

2.1 Sample

A list of 483 non-hospital based, freestanding ASCs in Los Angeles County, California served as the sample frame. This listing was intended to represent all ASCs in the county. Facilities were considered ineligible if surgeries, including those requiring only local anesthesia, peripheral nerve block, anxiolytics, or analgesics, were not performed at the facility. Size and specialty of the 483 facilities were not provided with the sample.

2.2 Questionnaire

The questionnaire consisted of two components. The first component (C1) was comprised of 21 questions about accreditation, staffing, size and capacity of the ASC, and sedation administration. This component could be completed by any administrative staff member

(e.g., office manager) or any ASC clinical staff member (e.g., medical director). The second component (C2) was comprised of 40 questions focusing on infection control procedures, policies, and training at the facility. Due to the nature of the questions, C2 was directed to the staff person who oversaw infection control activities in the facility.

The full printed questionnaire (both C1 and C2) was 8 pages, while C2 only spanned 4 pages. Mail questionnaires were printed as 2-column booklets. The mailed package included a cover letter with \$1.00, the questionnaire, and a postage-paid return envelope. The fax questionnaire maintained the same 2-column formatting as the mail questionnaire, but was transmitted on single-sided pages. A fax cover sheet included the contents of the mailed cover letter and provided the fax number for returning the completed survey. The questionnaire was also programmed in a multi-mode survey software system for computer-assisted telephone interviewing (CATI) and web self-administration. For the web mode, tailored email messages included the web survey URL and instructions for accessing the survey. The general contents of the mailed cover letter were included in the body of the email and on the survey landing page. The web survey displayed one question per screen.

2.3 Study Design

Each facility was mailed an introductory letter about 6 weeks before data collection and a pre-notification letter about 2 weeks before data collection. Data collection began on May 28, 2015 and ended on July 7, 2015. At the start of data collection, all facilities were contacted by telephone and attempts were made to complete C1 with the office manager or someone who could respond to the administrative-type questions. Based on an initial assumption that survey administration by telephone would achieve responses most efficiently, the telephone data collector would confirm the facility's eligibility and immediately begin the interview using CATI if the appropriate respondent for C1 was available. If C1 was completed by CATI, the telephone data collector then sought to complete C2 with the person who oversees infection control activities at the facility.

If the appropriate respondent was unavailable to complete C1 at the time of the call, the data collector attempted to administer the entire questionnaire (both C1 and C2) to the person who oversees infection control activities at the ASC (see Figure 1). If this person was unavailable, the telephone data collector asked for the name of the individual who oversees infection control activities and verified the facility's mailing address. The data collector then offered to call back, send the questionnaire via postal mail or fax, or send it by email upon request. If only C1 could be completed at the time of the call, the data collector offered to call back or send C2 via postal mail or fax (or by email upon request) to the appropriate respondent. Due to the challenges with obtaining response to web surveys among health care providers (Leece, Bhandari, Sprague, Swiontkowski, Schemitsch, Tornetta, Devereaux, & Guyatt, 2004; Nicholls, Chapman, Shaw, Perkins, Sullivan, Crutchfield, & Reed, 2011; Raziano, Jayadevappa, Valenzula, Weiner, & Lavizzo-Mourey, 2001), an email option was available only when requested by the respondent.

Telephone follow-up calls were made to each facility to encourage survey completion if the ASC had not completed both components. When both C1 and C2 were completed and received by project staff, a thank-you letter and \$20 gift card were mailed to the facility

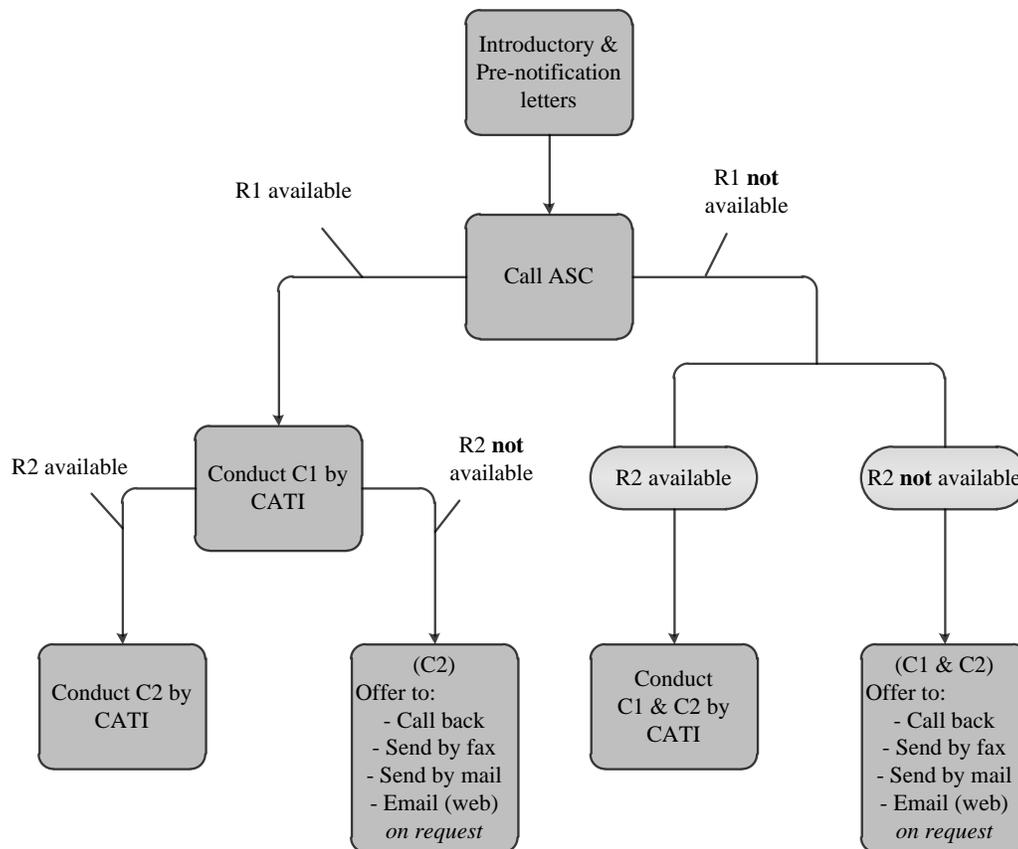


Figure 1: Overview of Study Design (R1= Administrative staff respondent; R2= Staff member who oversees infection control activities; ASC= Ambulatory Surgery Center)

2.4 Analysis

Detailed records of survey mode requested, mode(s) sent to each ASC, and the mode(s) used to complete the questionnaire were maintained by project staff. Mailed and faxed responses were entered by project staff using a data entry tool adapted from the web survey. Data from all modes were merged into one database.

Response rate was calculated using the American Association for Public Opinion Research (AAPOR) Response Rate 3 (RR3), which estimates the number of eligible cases among the facilities with unknown eligibility (The American Association for Public Opinion Research, 2015). We used descriptive statistics to determine average response speed and item nonresponse for each survey mode.

To investigate costs, we reviewed cost reports and process records to create assumptions and estimates for each mode's fixed cost, which are the costs associated with the survey that are not dependent on the size of the sample or number of responses. Variable costs, or the costs affected by the number of sites surveyed, were also calculated. These costs include the costs associated with fielding the instrument, costs of interviewers' labor, and costs for data entry. We estimated that each facility received 2 reminder telephone calls, except for those facilities that completed the survey by CATI. All fixed and variable costs were tabulated for each mode and costs per unit complete were calculated taking into

account all fixed and variable costs per mode per complete. Costs are presented as ratios for international applicability.

3. Findings

3.1 Response Rate

Of the 483 ASCs included in the sample, 114 completed the entire questionnaire (RR= 29.8%; AAPOR RR3). There were 13 partial completes in which C1 or C2 was completed, 84 ASCs identified as ineligible and 95 ASCs with unknown eligibility. Thirty-five cases resulted in refusal or incomplete drop-off (neither C1 nor C2 completed).

Of the 114 ASCs who completed both C1 and C2, 50% completed the questionnaire entirely by CATI while the remaining 57 ASCs completed by fax, web, mail, or some combination of modes (e.g., C1 was completed in a different mode than C2). Fax performed better than web or mail among the non-CATI completer group with 63.2% (n= 36) of the non-CATI completers responding to both C1 and C2 by fax (Table 1). Eleven ASCs completed C1 and C2 in different modes (“Mixed” in Table 1), 6 ASCs completed the entire questionnaire by web, and 4 ASCs completed by mail.

As the success of the fax mode became apparent, the team adapted the follow-up procedure to maximize overall RR. During the reminder telephone calls, project staff offered to fax the survey, regardless of original mode request which resulted in a number of mode conversions to fax, as seen in Table 1.

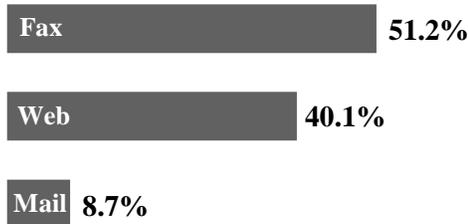
Table 1: Survey Mode Requests and Completions among the 57 Non-CATI Completers
(Telephone/CATI request unable to be determined)

		Mode Completed				<i>Total</i>
		<i>Mail</i>	<i>Fax</i>	<i>Web</i>	<i>Mixed</i> (<i>C1 mode ≠ C2 mode</i>)	
Mode Requested	<i>Mail</i>	4	2	0	1	7 (12.3%)
	<i>Fax</i>	0	25	0	6	31 (54.4%)
	<i>Web</i>	0	9	6	4	19 (32.3%)
	Total	4 (7.0%)	36 (63.2%)	6 (10.5%)	11 (19.3%)	57 (100%)

3.2 Preference

Among the full sample, 172 ASCs requested the entire questionnaire (C1 and C2) by one of the self-administered survey modes. Preference for telephone administration could not be assessed since the telephone data collector began the survey interview without offering alternative modes if the appropriate respondent was available at the time of the call. When presented with an option, ASC respondents most frequently requested to receive the entire questionnaire by fax (n=88, 51.2%) (Figure 2). Web and mail were less frequently requested by ASCs (n= 69 and n=15, respectively).

Figure 2: Survey Mode Requests among ASCs, Regardless of Completion
(Telephone/CATI request unable to be determined)



3.3 Efficiency

3.3.1 Average Response Speed

The average number of days elapsed between the first phone contact attempt and the date of completed questionnaire receipt was least for the telephone mode (6 days) and greatest for the mail mode (31 days) (Table 2). This includes failed attempts at first telephone contact. The average number of days elapsed between first phone contact attempt and receipt of completed fax questionnaires was 22 days; however, completed fax questionnaires were received an average of 6 days after the day it was faxed to the ASC, whereas completed mailed questionnaires were received an average of 22 days after the day it was placed in the mail to the ASC.

3.3.2 Missing Data

Although the rates of inappropriately skipped or refused items across all modes were below 3.0%, fax resulted in the highest rate of inappropriately skipped items of the four modes (Table 2). The rates for both web and CATI were negligible given the programming to ensure each question was answered before proceeding.

Table 2: Response Speed, Missing Data, and Costs by Survey Mode

	<i>Fax</i>	<i>Mail</i>	<i>Web</i>	<i>CATI</i>
<i>Ave. Days from 1st Call Attempt to Complete</i>	22	31	17	6
<i>Rate of Missing Data (%)</i>	2.3	1.3	0.0	0.2
<i>Fixed Costs</i>	\$	\$	\$\$\$	\$\$\$\$
<i>Unit Cost Per Complete</i>	\$	\$ ^c	\$\$ [^]	\$ ^c

3.3.3 Costs

The fixed costs for fax and mail were each about one-third of the fixed cost of web, and about one-fourth the fixed cost of CATI. The unit cost per complete was highest for web, which is largely due to the low completion rate of this mode. Mail and CATI had similar costs per unit complete, and fax resulted in the lowest cost per unit complete.

4. Discussion

The findings of this observational study suggest that fax may be a viable mode for surveys of free-standing ambulatory surgery centers, especially when bound by a short field period and limited resources. These findings are consistent with prior research that suggests physician preference for fax (Lensing et al., 2000). Contrary to the current research trend, very few ASCs completed the survey by postal mail. Previous studies have found mail surveys yield the greatest participation from health care providers compared with both telephone and web alternatives (Hocking, Lim, Read, and Hellard, 2006; Kellerman and Harold, 2001; Raziano et al., 2001), with little attention on the utility of fax as a survey mode. The success of mail may have been limited in this study due to the short time frame (5.5 week data collection period) and the lag time between initial phone contact and the ASC's receipt of the mailed survey. However, very few ASCs in this study requested the survey by mail when provided an option of survey mode.

In addition to preference for fax, this study also found that ASCs are responsive to faxed surveys and return completed surveys by fax relatively quickly following outgoing fax transmission. This is consistent with findings from McMahon et al. (2003), whose study suggests that using fax may be an efficient method if a quick response is required. Moreover, providing the fax option to ASCs required comparatively little costs since postage was not needed, printing was minimal, and programming and interviewer labor was not required.

In this study, the first telephone contact was used to engage the ASC gatekeeper and, if possible, complete the interview by CATI or collect information about preferred survey mode and verify necessary information (e.g., mailing address, fax number). Engaging the gatekeeper during initial telephone contact and follow-up calls may likely contribute to an overall higher response rate in surveys of clinical establishments. By engaging this point-of-contact, project staff encouraged him or her to be a "champion" of the survey. This was critical in overcoming the common "gatekeeper" obstacle while collecting accurate mailing addresses (in addition to fax number or email address, if requested) and name of the individual who could respond to the questionnaire. Collecting this information allowed the project team to address postal, fax, and email communications to the person identified as the respondent.

While the use and utility of fax for surveys of clinical establishments appears to be lacking in the recent literature, there may be characteristics about ambulatory medical facilities that make them particularly responsive to surveys by fax:

1. Fax is still a common form of communication in ambulatory medical practices, even in a time of burgeoning technological advances. Staff in these settings are generally familiar and at ease with the use of fax technology, requiring little burden on their behalf to return a completed survey. While use of fax is routine in these settings, offering the survey by fax may have been seen as a novelty—attracting more attention from this generally hard-to-access population.
2. The gatekeeper can be engaged in first contact and recruited to be a champion of the survey in their facility. This person may likely manage incoming/outgoing faxes on a regular basis, making he or she ideally positioned to encourage response from the appropriate individuals and fax the survey back. After speaking to this person on the telephone and verifying

contact information and survey mode, the survey can be transmitted shortly thereafter—keeping the gatekeeper engaged and creating a sense of urgency. A quick turnaround in sending the fax to the ASC also provides some assurance that someone will be aware and waiting on the receiving end for the survey.

3. A paper survey is a flexible approach to fit into the busy schedules of health care providers. Having the questionnaire on paper allows them to complete sections whenever time permits. In contrast, web surveys may be abandoned prematurely and forgotten without successful completion.
4. Ambulatory medical practices/facilities may have irregular hours of operation, and clinical staff may have very little time available during traditional business hours to complete a survey. Using only telephone for survey administration may result in a loss of resources from many failed attempts at reaching the respondent. Even with scheduled telephone appointments, clinical responsibilities and the unpredictability of medical cases can result in continued rescheduling of telephone appointments and partially completed interviews. However, initial telephone contact with the facility is important to verify contact information and engage the gatekeeper in the survey process.

This observational study does not go without limitations. Above all, this was not a controlled study design; there was no randomization and respondents or gatekeepers self-selected into survey mode. Although this limits generalizability of findings, allowing respondents or gatekeepers to select the survey mode was essential to assess preference and determine if fax is a favorable option in this hard-to-reach population. It is also important to note that this study had a small sample size, which limits the reliability and validity of the study results. The low number of reporting units to each mode led to small cell sizes, and should be interpreted taking into account the inherent limitations. Furthermore, the sample included only one type of ambulatory care setting in one geographic region. Considering the many similarities shared between ASCs and other types of ambulatory medical facilities, the preference for and relative success of fax may apply to other types of outpatient clinical establishments. Future studies are encouraged to test the replicability of these findings beyond the regional sample of ASCs included in this study.

Conclusion

Selecting a mode—or modes—for data collection involves tradeoffs in the different quality dimensions. While fax surveys cannot control for item nonresponse as successfully as web surveys or obtain completes as quickly as CATI, the findings of this study suggest that fax may be an efficient strategy to enhance response rates in surveys of clinical establishments for a minimal cost. Focusing initial telephone attempts on gaining buy-in from the gatekeeper and immediately transmitting the survey by fax may be an effective approach when faced with limited time and resources. Further research is needed to more formally examine preference and response to surveys by fax at the clinic or practice level, and explore the use of new software for automatizing mass faxings, including the use of character recognition technology to optimize the data capture process from returned surveys.

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