

Mode Choice in a Longitudinal Mail, Web, and Telephone Survey

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A. Introduction and Background

1. Theoretical Background

Research has shown that respondents often have mode preferences (Groves and Kahn 1979). Consequently, faced with declining response rates, survey researchers have been using mixed-mode approaches to encourage response and raise response rates. Preliminary research, however, has shown that providing a choice of modes does not necessarily raise the response rate. At best, it appears to shift respondents from an original mode to a newer mode, rather than increase response rates (Dillman et al. 1994; Lozar Manfreda 2001). Nonetheless, offering a range of modes may result in cost savings if respondents are drawn to a less-expensive mode.

A web option was introduced in 2002 to the National Survey of Substance Abuse Treatment Services (N-SSATS), an annual multimode (mail, web, and telephone) establishment survey as a means of increasing the response rate and potentially reducing data collection costs. An annual survey, such as N-SSATS, presents an excellent opportunity to look at mode preferences of respondents over time. Each year since 2002 the web response has increased, leading to questions about what factors determine a high web response rate. For this paper, we focus on answering three key questions: (1) How soon after offering the survey on the web did the respondent switch to that mode, and did the respondent remain loyal to the web mode in subsequent years? (2) What type of facility chooses the web—that is, hospital inpatient, residential, or outpatient? and (3) What region of the country tends to have the highest web response?

2. Study Background

N-SSATS, which is sponsored by the federal government's Substance Abuse and Mental Health Services Administration, is an annual survey of all substance abuse treatment facilities in the United States and its territories and is our nation's most comprehensive national source of data on substance abuse treatment facilities. Mathematica Policy Research, Inc., has been conducting N-SSATS via mail with telephone followup since 1997, and in 2002 a web survey option was introduced (the survey was not conducted in 2001). Each year, the survey achieves an overall response rate of about 95 percent. The survey instrument collects information on facility characteristics, such as facility ownership, facility type, and services offered; client count information; and general information. Every facility is expected to participate in the survey.

The N-SSATS sample includes approximately 17,000 facilities. Facilities vary in size from very small solo practices to very large hospital complexes, residential treatment centers, and outpatient clinics. Some are privately owned, while some are supported by public funds. In addition, more than half of the N-SSATS sample is administratively linked, forming large, multisite organizations.

Prior to 2002, N-SSATS was conducted as a mail survey with telephone followup; since 2002, both mail and web options have been available for the entire six-month data collection period. In the third month of the cycle, nonrespondents receive a telephone reminder call encouraging completion by web or mail, and in the fourth month, they begin receiving telephone calls encouraging them to complete the survey over the phone.

3. Research Questions

We pose a number of research questions related to mode choice on the N-SSATS survey. First, does offering a new mode, namely the web, increase the overall response rate to the survey? Second, if respondents move from an original mode to the newer mode, instead of increasing the overall response rate, from what mode do they move? Third, do respondents who choose to complete a survey using the web mode remain loyal to that mode in subsequent years, or do they revert to an original mode? Fourth, are there any patterns in response by mode that are influenced by a facility's type, size, or regional location? And fifth, what can we learn about respondents who never switched to the web mode during the seven years it was offered?

B. Methodology

A subset of facilities was chosen from the full N-SSATS frame of approximately 17,000 facilities for this study. Only facilities that completed N-SSATS every year from 2002 through 2008 were selected because we wanted to examine respondents' mode choice over the seven-year period. We excluded those that were located outside of the 50 states (those in a territory) and those operated by a federal agency (Army, Navy, Air Force, Indian Health Services, and Veterans Affairs). These criteria resulted in a sample of 7,439 facilities. The sample was then divided into cohorts according to the year the facility first completed the survey on the web, from 2002 through 2008, with an eighth cohort consisting of facilities that never completed a survey on the web. The mode of completion for facilities in each cohort was tracked over the seven-year period. To examine the size of each cohort and its mode preference over time, see Table C.3.

In an establishment survey such as N-SSATS, the target population, in this case facility directors, is an ever-changing population. One director might favor the internet, while his or her successor might prefer to complete the survey by mail. In addition, a director might delegate completion of the survey to an assistant or a counselor who has a different mode preference. The identity of respondents across years was not available. Therefore, two other measures were examined to identify how consistent a respondent's mode preference was after switching to the web mode. First, to learn how many of the facilities in each cohort stayed with the web mode every year after first switching to that mode, a crosstab was run to identify that group of facilities within each cohort. Secondly, making the assumption that there was a higher likelihood that the respondent in a given facility would be the same individual over a shorter period of time, the number of years following each cohort's first experience with the web mode was narrowed to just two years (see Table C.4).

Two additional descriptors were used to stratify each cohort—the type of service offered by the facility and the facility's regional location. The type of service offered by a facility (hospital inpatient, residential, or outpatient) could be a proxy for the size and/or complexity of the facility and therefore a possible indicator of tendency to complete the

survey via the web. The sample was stratified by its type of service based on three questions from the 2008 N-SSATS questionnaire: (1) Does this facility offer hospital inpatient substance abuse services at this location? (2) Does this facility offer residential (nonhospital) substance abuse services at this location? (3) Does this facility offer outpatient substance abuse services at this location? Four strata were added to this list to allow for mixed services: hospital inpatient and outpatient; hospital inpatient and residential; outpatient and residential; and hospital inpatient, outpatient, and residential. An additional stratum was included for facilities whose services were not consistent over the six-year period. For a table of the sample stratified by service type, see Table C.5.

To learn if the regional location of a facility would contribute to a facility's inclination to complete the survey on the internet, states were allocated into four broad regions, modeled after the regions defined by the U.S. Census—Northeast, South, Midwest, and West. Facilities were assigned to a region based on the location of their state. For a table of the sample stratified by region, see Table C.6. For a list of the states in each region, see Appendix A.

C. Findings

1. Does Offering a New Mode, Namely the Web, Increase the Overall Response Rate to the Survey? And if Respondents Move from an Original Mode to the Newer Mode, from What Mode Do They Move?

The annual response rate to the survey has remained relatively stable over the years at roughly 95 percent. Since the introduction of the web mode in 2002, there has been a shift in response from the mail to the web mode, and the telephone mode has remained the same. Table C.1 presents the annual response rate for the survey by year and mode. The response rate rose by one percentage point in 2002 to 96 percent when the web mode was introduced and then stayed roughly at the same level for the following two years. It then fluctuated slightly from 2005 to 2008 but hovered at around 95 percent.

Table C.1. N-SSATS Response Rates By Year and Mode

Year	Response Rate			
	Overall	To Web Survey	To Mail Survey	To Telephone Survey
1997	90.2	n/a	72.5	17.7
1998	91.5	n/a	63.3	28.2
1999*	96.2	n/a	n/a	96.2
2000	94.9	n/a	73.0	21.9
2002**	96.1	17.6	55.5	23.0
2003	96.5	23.9	49.0	23.6
2004	96.3	26.0	47.2	23.1
2005	95.7	28.8	43.6	23.3
2006	96.9	31.7	41.2	24.0
2007	95.1	38.3	36.2	20.6
2008	94.7	40.6	33.1	21.0

*The 1999 survey was conducted by telephone only.

**The web mode was pilot tested in 2000 with a small number of mail nonrespondents. The web mode was first introduced to the entire population in 2002. No survey was conducted in 2001.

The response rate to the web mode has gradually increased since it was introduced, from 17.6 percent in 2002 to 40.6 percent in 2008. The mail response rate has decreased by roughly the same amount over the same time period, from 55.5 percent in 2002 to 33.1 percent in 2008, while the telephone response rate has remained relatively static over the same time frame, hovering at around 23 percent.

We examined the pattern of response of those who switched to the web mode in the year prior to their switch. The year before switching to the web mode, respondents completed the survey by mail and telephone in roughly the same proportions as the overall survey response rates by mode in the year prior to introducing the web mode. Table C.2 displays the average proportion of responses by mode in the year prior to when respondents switched to the web. These proportions mirror the response rates for the mail and telephone modes achieved on N-SSATS prior to introducing the web mode.

Table C.2. Average Percentage of Response By Mode for Respondents in Year Prior to Switching to Web Mode

	Number of Completes (and Average Proportional Response) in the Year Prior to Switching to Web Mode	
Total	Mail Mode	Telephone Mode
4,279*	3,202 (74.8)	1,077 (25.2)

*Does not include the 1,672 cases that switched in 2002, because no survey was conducted in 2001 with which to compare them.

2. Do Respondents Who Choose to Complete a Survey Using the Web Mode Remain Loyal to That Mode in Subsequent Years or Do They Revert to an Original Mode?

We hypothesized that respondents would largely remain with the web mode in successive years once they chose it initially, but we were surprised by the findings. Table C.3 presents the number of respondents who switched to the web each year during 2002 to 2007 and the average percentage that completed a survey by web, mail, and telephone over the successive years. The percent of the 2002 web cohort who stayed with the web was nearly 62 percent. The 2003 web cohort was slightly lower, at 56.4 percent, and then the percentage climbed for each successive web cohort to a high of 63.5 percent in 2007. The proportion of mail mode respondents reached a high of 31.5 percent for the 2003 cohort and slowly dropped to a low of 23.5 percent for the 2007 cohort, while the proportion of telephone mode respondents fluctuated slightly but remained relatively constant at around 12 percent.

Table C.3. Average Percentage of Response By Mode and Year Over Successive Years for Respondents Who Switched to Web Mode

Year Switched to Web	Number of Respondents Who Switched to Web	Average Percentage Response over Successive Years		
		Web Mode	Mail Mode	Telephone Mode
2002	1,672	61.6	25.9	12.4
2003	1,203	56.4	31.5	12.1
2004	825	57.0	27.5	15.5
2005	659	61.9	25.3	12.7
2006	571	63.0	24.9	12.1
2007	570	63.5	23.5	13.0
2008	451	n/a	n/a	n/a
Total	5,951	60.6	26.4	12.9

Clearly respondents who chose the web mode do not remain with that mode in subsequent years in the large numbers we hypothesized. A quarter of the respondents continue to complete the survey in successive years by mail, and a smaller number continue to complete it by telephone (13 percent). What is not clear from this table is whether the same respondent stays with the web over time or whether that respondent switches modes every year or every few years. For this reason, we examined respondents' individual loyalty to staying with the web mode over time.

Table C.4 displays respondents' true loyalty to the web mode over time after they selected it initially. The number of respondents who selected the web mode is highest in 2002, when the web option was first introduced, and the remaining cohorts switched to the web steadily over time. Most of the earliest web choosers, however, do not remain loyal to the mode. Only 25 percent of the early adopters stayed with the web mode in all six subsequent years, but nearly half of them stayed with the mode for two subsequent years. The percentage of web adopters who stayed with the web mode over the two subsequent years was highest for the 2002 cohort as well as the 2005 and 2006 cohorts.

3. Are There Patterns in Mode Response By a Facility's Type, Size, or Regional Location?

We expected to see different patterns of response by facility type and hypothesized that hospital inpatient facilities would be more likely to complete the survey by web because they are larger, more organized, and more likely to have electronic systems in place than residential or outpatient facilities. Table C.5 displays the number of respondents who switched to the web in 2002 by facility type and the average proportion that completed a survey in each mode in successive years. We chose the 2002 cohort to present because it has the greatest number of sample points and the longest number of successive years to

Table C.4. Respondent Loyalty to Web Mode Over Time

Year Switched to Web	Number of Respondents Who Switched to Web Mode	Number (and Percentage) of Respondents Who Stayed with Web Mode for Successive Years	Number (and Percentage) of Respondents Who Stayed with Web Mode for Two Successive Years
2002	1,672	419 (25.0)	778 (46.5)
2003	1,203	274 (22.7)	463 (38.5)
2004	825	222 (26.9)	313 (37.9)
2005	659	250 (37.9)	302 (45.8)
2006	571	284 (49.7)	284 (49.7)
Total	4,930	1,449 (29.4)	2,140 (43.4)

analyze. Hospital inpatient facilities completed the survey by web much less often than residential or outpatient facilities (50 percent compared with 67 percent or 63 percent, respectively), and completed the survey by mail or by telephone much more often than residential or outpatient facilities (36 percent compared with 24 percent or 25 percent, and 13 percent compared with 9 percent and 11 percent, respectively). A chi-square test confirmed that there was a statistically significant association between mode and service type.

Table C.5. Average Percentage of Response By Facility Type and Mode Over Six Successive Years for Respondents Who Switched to Web Mode in 2002

Type of Service	Number of Respondents Who Switched to Web in 2002	Average Percentage Response Over Six Years		
		Web Mode	Mail Mode	Telephone Mode
Hospital Inpatient	11	50.0	36.4	13.6
Residential	211	67.3	23.9	8.8
Outpatient	1,013	63.3	25.0	11.7
Mix of Service Types or Fluctuating Responses	437	55.3	28.9	15.8

Chi-square $p < .0001$

The last service category includes facilities that are a mixture of inpatient, residential, and outpatient or that fluctuated in how they reported the services they offer, probably due to different individual respondents from year to year. It is therefore difficult to decipher anything meaningful from this group, although their pattern of response mirrors that of the hospital inpatient group most closely.

We next looked at patterns of response by region of the country where facilities were located. We compared response patterns by mode across four geographic regions: Northeast, South, Midwest, and West. Table C.6 presents the number of respondents who switched to the web in 2002 by region and the average proportion that completed a survey in each mode in successive years. We chose the 2002 cohort to present because it has the greatest number of sample points and the longest number of successive years to analyze.

Facilities in the Midwest completed the survey by web in greater numbers than did facilities in any of the other three regions. Midwest facilities were also far less likely to complete the survey by telephone than facilities in the other three regions. Facilities in the South were more likely to complete the survey by mail or telephone and far less likely to complete the survey by web than their counterparts in the other three regions. A chi-square test confirmed that there was a statistically significant association between mode and region.

Table C.6. Average Percentage of Response By Region and Mode Over Six Successive Years for Respondents Who Switched to Web Mode in 2002

Region	Number of Respondents Who Switched to Web in 2002	Average Percentage Response Over Six Years		
		Web Mode	Mail Mode	Telephone Mode
Northeast	404	62.8	25.8	11.3
South	462	56.5	27.9	15.5
Midwest	416	67.4	23.9	8.7
West	390	60.3	26.0	13.7

Chi-square $p < .0001$

4. Can We Learn Anything from Respondents Who Never Switched to the Web Mode During the Seven Years It Was Offered?

Examining patterns of response for respondents who never switched to the web mode may provide some interesting clues about their mode preferences. We looked at the response patterns of those who never switched to the web mode and compared them with the full sample prior to introducing the web option. Table C.7 presents the number and average proportion of respondents by mode who never switched to the web mode during the seven years it was offered. The proportion of responses of the never-switched group is nearly identical to the proportion seen in Table C.2 for all respondents in the year prior to switching to the web mode (75 percent mail and 25 percent telephone). We also looked

at differences in response by facility type and by region but did not discern any meaningful differences.

Table C.7. Number and Average Percentage of Response By Mode for Respondents Who Never Switched to Web Mode

Total Number of Respondents Who Never Switched to Web	Average Number of Completes (and Percentage Response) Over Successive Years	
	Mail Mode	Telephone Mode
1,488	1,129 (75.8)	359 (24.1)

D. Conclusions and Discussion

1. Study Limitations

There are several limitations to the study that should be mentioned. (1) This was purely a descriptive analysis based on observation of mode choice in a longitudinal survey. No true experiment was conducted. We cannot generalize these findings to other establishment populations. (2) The sample used for the analysis was a subset of cases from the full data set that completed an interview each year over the seven years. We excluded facilities that did not complete a yearly interview. Thus, there might be differences in the type of facilities that completed a survey each year compared with those that did not, and so the sample used for this study may not be truly representative of the full sample of facilities. (3) We know little to nothing about the individuals who responded to the survey except that there is high turnover of staff at most facilities. Therefore it is hard to discern what is driving the differences in mode choice within a facility from year to year.

Given these limitations, we have drawn a number of conclusions from this descriptive analysis.

Offering a new mode, namely the web, does not increase the overall response rate to the N-SSATS survey. Instead, respondents tend to move from the mail mode to the web mode. The response by telephone across the years remains quite static and does not appear to be affected by the introduction of the web mode. In the year prior to switching to the web mode, the proportion of responses to the survey tends to mirror the response rates that the N-SSATS survey achieved prior to introducing the web mode. The same pattern is reflected in respondents who never switched to the web mode over the seven years that it was offered. The mode switch was primarily from mail to web. Phone responders remained the same.

There are three main reasons for this. First, the web mode is introduced to respondents in the mailed packet of materials, not via email. It therefore tends to draw from respondents who would have completed a mail questionnaire. Second, the phone responders are late responders because the phone mode is introduced late in the field period after exhausting the mail and web attempts. Offering another mode choice at the outset does not seem to affect the behavior of a procrastinator. Research has shown that providing a web link in

an email (in the same medium) tends to improve response via the web. However, reliable facility-level email addresses are not available and therefore this is not an option for this survey, at this time. Third, the overall response rate to the survey was exceptionally high before introducing the web mode. A mode switch might have had a larger impact if the initial response rate were lower.

Most web respondents go back to an original mode in successive years, and most return to the mail mode. However, around 43 percent of those who switch to the web mode complete the survey in the web mode for two consecutive years. About 60 percent of respondents who switch to the web mode continue to complete surveys in successive years using the web, but the mixture of respondents using the web mode fluctuates from year to year. A relatively small number of respondents who switch to the web mode remain loyal to that mode in all subsequent years (29 percent). But 43 percent of those who switch to the web mode complete the survey in the web mode for two consecutive years. The difference between these two numbers might be due to high staff turnover at the facility and a change in mode preference of the new respondent.

Respondents are free to choose the mode for completing the survey, and their mode preference might be driving the patterns of response we see. Unfortunately, we do not know much about the respondents themselves, only the facilities in which they work. We do not know if the respondent changes from year to year within a given facility, nor do we know the characteristics of a respondent, such as age, gender, education, and years at the facility and in his or her current position. One suggestion for the future is to add to the next round of the survey a few key demographic questions about the respondent (age, gender, education level, years in current position) to analyze them to further understand the differences in mode preference we see.

Mode response differs by facility type: hospital inpatient facilities respond in disproportionately smaller numbers to the web than do residential and outpatient facilities. Although all facility types are more likely to respond by web than by mail or telephone, hospital inpatient facilities are more likely to respond by mail and by telephone than residential and outpatient facilities. Residential facilities respond in higher proportions to the web compared with the other two facility types and respond by telephone the least of the three facility types.

Respondents from hospital inpatient facilities should have easy access to computers at work, so access is not the issue. Hospital inpatient facilities tend to be larger than the other two facility types. Respondents from hospital inpatient facilities might be busier and more pressed for time than respondents from residential or outpatient facilities. What is not known is whether there are any differences in respondent characteristics—such as age, gender, or education level—among those who work at hospital inpatient facilities compared with residential or outpatient facilities. There might be mode preferences by the type of staff who work at each facility type that we are unable to detect.

Mode response differs by region: facilities in the Midwest completed the survey by web in greater numbers than did facilities in the Northeast, South, or West. Midwest facilities were also far less likely to complete the survey by telephone than facilities in the other three regions. In addition, facilities in the South were more likely to complete the survey by mail or telephone and far less likely to complete the survey by web than their counterparts in the other three regions. It is not clear what is driving the mode preferences seen by region. It could be that each region draws different kinds of people to

it and those differences are behind the mode preferences we see. We would like to explore this issue further by analyzing the response by mode across rural versus urban areas and across ownership (private versus public) to see if this might explain some of the patterns.

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Appendix A
Breakdown of States By Region

Northeast	Connecticut Maine Massachusetts New Hampshire New Jersey New York Pennsylvania Rhode Island Vermont
Midwest	Illinois Indiana Iowa Kansas Michigan Minnesota Missouri Nebraska North Dakota Ohio South Dakota Wisconsin
South	Alabama Arkansas Delaware District of Columbia Florida Georgia Kentucky Louisiana Maryland Mississippi North Carolina Oklahoma South Carolina Tennessee Texas Virginia West Virginia

West	Alaska
	Arizona
	California
	Colorado
	Hawaii
	Idaho
	Montana
	Nevada
	New Mexico
	Oregon
	Utah
	Washington
	Wyoming

Source: U.S. Census Bureau 2008.