



CAHPS Survey Administration: What We Know and Potential Research Questions

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Background

Users of the Consumer Assessment of Healthcare Providers and Systems (CAHPS®) patient experience surveys include clinicians, healthcare managers and systems, federal and private health care purchasers, accreditation organizations, professional associations, vendors, and researchers. CAHPS survey users have increasingly expressed concern about three closely related issues:

1. Declining response rates for CAHPS surveys.
2. The extent to which CAHPS survey results are representative of diverse populations.
3. The increased cost and administrative burdens on hospitals, health systems, medical practices, and other health care organizations from expanding survey requirements related to public reporting and value-based payment initiatives.

These concerns have led to increased interest in the development and use of improved survey administration methods to increase the efficiency of data collection, enhance response rates, and access patient populations that have typically been hard to reach using traditional survey methods. In particular, some have advocated for greater use of electronic modes of survey administration—like e-mail, Web, and mobile devices.

This literature review is organized into two parts:

1. Highlighting what we already know from research on traditional and newer survey administration modes using CAHPS and other surveys, and
2. Identifying what survey administration methods and approaches require further research to better understand their advantages and disadvantages when administering CAHPS surveys.

Part 1: What We Know

Part 1 summarizes what the survey administration literature to date tells us about the impact of survey administration modes, survey length and design, and incentives on the following outcomes: response rates, representativeness, data quality, and costs.

Survey Administration Modes

Most articles about CAHPS surveys focus on traditional survey administration modes—mail and phone. Other approaches, such as in-person distribution and in-person interviews, have been explored to a lesser extent as they can be expensive and the selection of respondents may not represent all types of patients. Newer approaches, however, such as Web/e-mail and interactive voice response (IVR) are gaining increasing attention. Overall, newer modes of survey administration, though frequently less expensive, do not appear to yield response rates higher than traditional approaches; in fact, response rates are often lower. Instead, preliminary research suggests that these newer modes, particularly Web/e-mail, may be most effective when used as part of a mixed-mode effort. This section presents research findings about the survey administration modes typically used to administer CAHPS surveys.

Traditional Modes: Mail and Phone

Mail is used in the majority of CAHPS data collection approaches. As a primary mode of survey administration, mail surveys tend to achieve higher response rates than phone surveys and are also less expensive. In addition, response rates for phone interviews are steadily decreasing due to the increased use of cell phones instead of landlines (47% of American homes only use cell phones; Blumberg & Luke, 2015) and screening devices such as caller ID.

While phone is not optimal as the only mode of survey administration, it is commonly used as a follow-up for CAHPS and other mail surveys. Phone follow-up can improve CAHPS response rates compared to mail-only by 4 to 20 percentage points (Burkhart et al., 2014; Drake et al., 2014; Elliott et al., 2009; Fowler et al., 1999; Fowler et al., 2002; Gallagher et al., 2005; Hepner et al., 2005; Klein et al., 2011). A study of Medicare beneficiaries found that response rates continue to improve when up to 4 follow-up calls are made (Burkhart et al., 2014), while CAHPS fielding guidance for the general population recommends up to 5 or 6 follow-up calls per respondent. In addition, phone follow-up calls help to achieve better representation of patients in terms of income, literacy/education, health status, age, gender, and race/ethnicity, above and beyond mail surveys alone.

Since up to 66% of mail non-respondents have been found to have non-working phone numbers (Gallagher et al., 2005), the largest source of nonresponse during phone follow-up administration is difficulty locating contact information. Some CAHPS Medicare Fee-for-Service studies have therefore compared the use of regular mail with phone follow-up to the use of regular mail with specialty mail follow-up (e.g., courier mail, priority mail) in Medicare populations. Mail with specialty mail follow-up appears to yield the same or slightly better response rates as mail with phone follow-up, especially if using overnight courier mail for the final mailing (Dimitropoulos et al., 2003; Eicheldinger et al., 2003; Pugh et al., 2002).

Studies examining the effect of mode on response patterns have found that phone ratings are often more positive than mail ratings, regardless of whether the calls are initial or follow-up administrations. In general, answers to interviewer-administered surveys are more prone to social desirability bias, that is, respondents wanting to answer in a way that will be viewed favorably by others.

Key Points: Mail and Phone

- Mail-only surveys achieve higher response rates than phone-only surveys.
- Mail surveys tend to be less expensive than phone and less prone to measurement errors such as social desirability bias.
- Phone follow-up can substantially improve overall response rates and respondent representativeness.
- The effectiveness of phone follow-up may decrease in the future due to increased use of cell phones and call screening.

Web Surveys

Web surveys collect data online using the Internet, accessed by computer, tablet, or mobile device. Lower cost accounts for much of the appeal of Web surveys; administration can be less expensive than mailing surveys or conducting live interviews, at less than \$2 per returned survey compared to traditional costs of about \$10 per returned survey, according to one study (Bergeson et al., 2013). Furthermore, the majority of Web survey costs are incurred during survey programming, so adding additional respondents does not substantially increase costs, assuming invitations are e-mailed.

Some AHRQ CAHPS survey administration guidelines provide guidance for administering Web surveys in conjunction with mail or phone follow-up. This guidance is intended for CAHPS surveys administered for quality improvement purposes, not for reporting CAHPS data to the Centers for Medicare and Medicaid Services (CMS). However, AHRQ guidance does not recommend administering surveys using the Web only. Not all patients have access to or use the Internet regularly, so responses to a Web-only survey may not adequately represent the patient population.

Although the gap is narrowing, adults in the U.S. who are older, less educated, poorer, Hispanic, or Black are less likely to use the Internet. The largest gap is by age: only 58% of seniors (65 years or older) used the Internet in 2015, compared to 96% of 18 to 29 year-olds. In addition, only 78% of Black (non-Hispanics) and 74% of lowest income households used the Internet in 2015, compared to 85% of White non-Hispanics and 97% of highest income households (Perrin & Duggan, 2015). Accordingly, those with lower Internet access levels are not as well-represented in Web surveys.

When comparing modes, limited research on CAHPS survey administration suggests that Web survey response rates on the CAHPS Clinician and Group Survey vary substantially: at best, Web yields slightly higher response rates than mail (by 4 percentage points; Carden, 2014), and at worst it yields substantially lower response rates (by 19 percentage points; Bergeson et al., 2013). In survey administration research not specific to CAHPS, Web response rates tend to be lower than mail response rates (Link & Mokdad, 2005; Messer & Dillman, 2011; Shih & Fan, 2008).

It is possible that Web response rates will improve over time as Internet usage increases across demographic groups. In the meantime, a potential solution to ensure more representative coverage and higher response rates is to use Web with mail follow-up. Mail may be preferable to phone as a follow-up mode to Web because Dillman et al. (2009) found that two visual survey modes (e.g., Web and mail) will yield more similar scores than other combinations of survey modes (e.g., Web and phone). In terms of response rate effects, one CAHPS Clinician and Group study found that Web with mail follow-up yielded a 50% response rate (Brown et al., 2016), while another study that did not use CAHPS found that Web with mail follow-up boosted response rates by 8 percentage points (Messer & Dillman, 2011). Importantly, however, literature on both the CAHPS Hospital Survey and non-CAHPS surveys has found that offering respondents a concurrent choice between Web and paper actually yields lower response rates than offering mail alone (Elliott et al., 2012; Medway & Fulton, 2012).

Invitations to participate in Web surveys can be sent via e-mail with an embedded hyperlink, or a Web address can be included in a printed/mailed invitation. There is limited and conflicting CAHPS research comparing these two approaches, but current AHRQ CAHPS fielding guidelines suggest sending an e-mail

Key Points: Web Surveys

- Web surveys are less expensive but can yield substantially lower response rates than mail surveys.
- Web respondents are more likely to be younger, more educated, higher income, and White.
- Providing a concurrent choice between Web and another mode lowers response rates.
- Using a mixed-mode of Web with mail follow-up can increase response rates.

with an embedded hyperlink. On the other hand, one study found that the majority (about 80%) of people who were sent e-mail invitations to complete a CAHPS Clinician and Group Web survey did not even open the e-mail (Bergeson et al., 2013). Another issue is that valid e-mail addresses often are not available or up to date. Non-CAHPS studies have found that traditional mailed invitations to Web surveys produce higher response rates than e-mailed invitations, concluding that mailed invitations may be more successful at emphasizing the legitimacy and importance of the study (Dykema et al., 2013). Further research is needed to provide more information about the most effective Web invitation approaches.

Interactive Voice Response (IVR)

With an IVR survey, a pre-recorded voice (either human or digitized) presents the question and response options, and the respondent either presses a number on the phone keypad (touch-tone IVR) or speaks their response into the phone (speech-enabled IVR). This is a lower-cost alternative to traditional live interviewer-administered phone surveys.

Like traditional phone surveys, IVR is more likely to reach people that have lower response rates to mail surveys, including racial/ethnic minorities and those with lower education levels. In addition, IVR eliminates the potential bias of an interviewer with standardization of question delivery, and can produce less positive responses than a traditional phone interview.

Despite these potential benefits, there are a number of drawbacks to this method. When no alternative modes are presented to potential respondents, touch-tone IVR yields the lowest response rates of any CAHPS survey administration mode (Carden, 2014; Elliott et al., 2009; Shea et al., 2008). In a CAHPS Hospital Survey study, when potential respondents in a speech-enabled IVR condition were given a choice between responding by IVR or through a phone interviewer, the majority (75%) transferred to the interviewer (Elliott et al., 2012). Another study using the CAHPS Health Plan Survey found that 78% of respondents in an IVR condition chose to complete a print version when given the option (Shea et al., 2008). Of those who do choose IVR, non-CAHPS studies have found that many will not complete the survey, particularly during the transfer from a live interviewer to the IVR system (Rodriguez et al., 2006; Tourangeau et al., 2002; Tourangeau et al., 2003). Although survey administration guidelines for some CAHPS surveys include IVR administration, very few CAHPS studies involving IVR have been conducted, and the research thus far suggests that this is not a preferred mode.

Key Points: IVR

- Two types of IVR: touch-tone and speech enabled. Both are less expensive than traditional phone interviews.
- IVR yields low response rates, particularly touch-tone IVR.
- When given a choice within IVR to select a different mode, most respondents choose a non-IVR option.
- Compared to mail surveys, IVR reaches more racial minorities and those with lower education levels.
- IVR is less susceptible to social desirability bias.

In-Person Survey Distribution

In-person survey distribution is when patients are personally handed paper or tablet/electronic surveys at the time services are received. In contrast to in-person interviews, which involve an interviewer, surveys that are distributed in-person are self-administered. CAHPS survey administration guidelines currently do not recommend this approach. One CAHPS study that looked at in-person paper survey distribution of the Clinician and Group Survey at medical offices found that response rates were lower than mailed surveys by approximately 18 percentage points (Anastario et al., 2010). On the other hand, both a CAHPS Clinician and Group and non-CAHPS patient experience study found similar response rates for both approaches (Edgman-Levitan et al., 2011; Burroughs et al., 2005). In-person distribution of invitations with a Web address is not effective, yielding a 3% response rate (Edgman-Levitan et al., 2011).

Key Points: In-Person Distribution

- In-person distribution of paper surveys may yield lower response rates compared to mail.
- Surveys may not be distributed in a systematic or unbiased manner unless outside staff is hired.
- In-person distribution can cost more than mail surveys if outside staff is hired.

Another concern with in-person survey distribution at the point of care is that respondent confidentiality can be compromised. Since patients are reporting confidential and sensitive information, it is important for them to do so in an environment where they feel confident that their answers cannot be traced back to them. Finally, surveys administered at the point of care by office staff might not be distributed in an impartial manner or according to a specified sampling design. For example, surveys might be distributed to certain types of patients or those who are expected to rate their experiences highly. This can affect both the representativeness of the sample and the data quality of the responses provided. One non-CAHPS patient experience survey, for example, garnered more positive scores on surveys distributed in-person than on mailed surveys (Burroughs et al., 2005). However, another study found that if outside administrative staff were hired for CAHPS Clinician and Group Survey distribution, this positive rating bias was mitigated (Edgman-Levitan et al., 2011). Notably, this approach also cost 36% more than using mailed surveys (and 8% more in cost per returned survey), refuting a prevalent belief that in-person distribution is a lower-cost option.

At this point in time, there do not appear to be any consistent advantages to distributing surveys in person, which is why this is not a recommended mode for CAHPS surveys.

In-Person Interviews

The only CAHPS surveys that recommend in-person interviews are the CAHPS Nursing Home Long-Stay Resident Survey and the CAHPS Home and Community-Based Services Survey. In a study of in-person interviews as a follow-up to mail and telephone data collection using the CAHPS Health Plan survey with Medicaid recipients, response rates increased by 20 percentage points (Gallagher et al., 2005). In fact, higher proportions of mail non-respondents could be reached by in-person interviews than phone follow-ups. In addition, in-person interviews substantially improved the representativeness of respondents in terms of age, race/ethnicity, and health status. Similar results have been found in the general survey literature (e.g., Groves et al., 2009; de Leeuw & van der Zouwen, 1988). However, because in-person interviews are very expensive, if they are used at all, attempting both mail and phone administration first should be considered.

Survey Length and Design

The length of surveys and the extent to which they are designed to be user-friendly can influence survey response; key findings are discussed below. Overall, shortening survey length can reduce costs but does not appear to improve response rates, while user-friendly survey design does appear to increase response rates in low-literacy populations.

Survey Length

Survey length is a concern because of its potential impact on administration costs and response rates. Page length can be shortened by either compressing blank space (following CAHPS formatting guidelines), or by removing items. Two studies found that compressing a standard 12-page CAHPS Clinician and Group Survey to four pages, without removing items, saved approximately \$400 to \$500 in printing and mailing costs per 1,000 surveys (Drake et al., 2014; LeBlanc et al., 2013). In addition, this compression did not affect response rates or data quality. Another study found that creating a horizontal instead of vertical listing of response categories is not recommended, as this lowered response rates by up to 9 percentage points and impacted data quality (LeBlanc et al., 2013).

Key Points: Survey Length and Design

- Compressing space in surveys can lower costs, but response options must be presented in a vertical column to avoid detriments to response rates and data quality.
- Adding supplemental CAHPS items may decrease response rates, especially for phone surveys.
- The relative contributions of specific design adjustments are currently unclear.

One study used a non-experimental approach to assess the reliability and validity of scores on the CAHPS Clinician and Group Survey when reducing the number of items used (Stucky et al., 2016). The researchers created various item subsets from completed, full-length surveys and compared responses across those subsets. They concluded that certain survey domains could be reduced to as few as one or two items without substantial loss in reliability. However, more research using experimental approaches is needed to determine whether shorter versions of existing CAHPS surveys yield equivalent reliability and validity.

The relationship between survey length and response rates is not entirely clear. One study found that CAHPS survey length had little impact on response rates (Gallagher & Fowler, 1998). However, a more recent study suggests that adding supplemental items to CAHPS surveys can be detrimental. More specifically, supplemental items decreased response rates on the CAHPS Medicare Advantage and Prescription Drug Plan Survey by a little over a percentage point for every 6 items added, with even sharper decreases when administering surveys by phone or to certain racial minorities (Beckett et al., 2016). Additional research is needed to determine the current impact of survey length on response rates.

User-Friendly/Low-Literacy Design

Twenty nine percent of U.S. adults are estimated to have only basic literacy skills according to the National Center for Education Statistics, so it is important to consider how to make a survey more approachable for this population. Beyond simplifying the reading level of a questionnaire's content, survey research has developed principles for making self-administered questionnaires more "user-friendly," including how best to convey navigational/skip instructions, using graphical design features to improve respondent comprehension, and the placement of instructions (Christian et al., 2007; Christian & Dillman, 2004; Jenkins & Dillman 1993; Redline & Dillman, 2002). However, there is little research,

CAHPS-related or otherwise, isolating the effects of these user-friendly adjustments on response rates. One CAHPS Health Plan study experimented with various user-friendly design adjustments and found that together they increased response rates by 9 percentage points (Fredrickson et al., 2005). For instance, the study used arrows indicating where to go for complex skip patterns, along with clear delineations of borders, titles, and instructions using shading and lines. In addition, simplified language and decorative designs were used in mailing materials. However, because all of these adjustments were tested together, the study could not differentiate the contributions of specific design elements towards improving response rates.

Incentives

There is limited research on the impact of incentives on CAHPS response rates, but promised incentives of \$5 and \$10 in the form of cash or gift cards appear beneficial, improving response rates by 7 and 20 percentage points, respectively (Brown et al., 2016; Fredrickson et al., 2005). Furthermore, the general survey research literature has found that pre-paid incentives as low as \$2 can increase response rates by up to 10 percentage points (Mercer et al., 2015), with the effect being strongest for mailed surveys.

While using incentives might increase overall survey administration costs, they can also simultaneously lower the cost per completed survey by improving response rates or reducing the need for follow-up contact. In the general survey research literature, one study found that compared to no incentive, the cost per completed mail survey was 16 cents lower when offering a \$2 pre-paid cash incentive (Beebe et al., 2005), and another found the cost per complete was \$9 lower when offering a \$5 pre-paid incentive (Dykema et al., 2012). When given the choice, respondents prefer cash, although that option can be more expensive for researchers. For instance, a cash incentive added \$3.32 to the incentive cost per person, while a department store e-gift certificate only added \$2.49 (Brown et al., 2016).

Of note, CMS does not allow providers or survey vendors to offer incentives of any kind for patient participation in CMS-sponsored CAHPS survey data collection or reporting because they may introduce bias in the survey results (Centers for Medicare & Medicaid Services, 2017). More research is needed to determine the effects of incentives on CAHPS survey scores.

Key Points: Incentives

- There is limited CAHPS research on incentives.
- CAHPS promised incentives of \$5 to \$10 can increase response rates.
- In general, small pre-paid incentives as low as \$2 can substantially increase response rates and lower the cost per completed survey.

Part 2: Potential Future Research

Mail with phone follow-up is the most commonly researched CAHPS survey administration approach. While other survey modes and approaches potentially hold promise, more research is needed to better understand how best to leverage their advantages while minimizing their disadvantages. Part 2 presents examples of some prospective research questions for future exploration.

Survey Administration Modes

- **Web**—Used as the only source of survey administration, Web surveys can yield lower response rates compared to traditional administration modes and reach a less representative sample. If Web surveys are desired, future CAHPS research should investigate:
 - a) The merits of using a combination of mail and e-mail invitations and reminders, and
 - b) Similarities or differences in respondents' answers and characteristics across Web and mail surveys. Although gaps in Internet use for various demographics are shrinking, these gaps persist and researchers should continue to keep respondent representativeness in mind when considering use of Web surveys.
- **Mobile Devices**—With the declining use of landline phones and the increasing use of smart phones and tablets, there are various avenues of promising research:
 - a) The use of SMS text messages on cell phones to administer survey questions or invite potential respondents to take a survey (however, pre-consent to send text messages due to respondent costs associated with receiving and sending text messages may be an issue);
 - b) How to effectively design CAHPS Web surveys to be administered and answered on mobile devices, and
 - c) The effectiveness of displaying or handing out scannable QR (Quick Response) barcodes, which would link to a Web survey.
- **Interactive Voice Response (IVR)**—IVR survey administration studies have demonstrated that IVR yields low response rates. IVR as a method of survey administration also affects how respondents answer questions. However, it has not frequently been compared to phone surveys using CAHPS, and has not been used as a follow-up method to another mode. Future research could further investigate how IVR follow-up compares to phone follow-up on mailed CAHPS surveys in terms of response rates, representativeness, and data quality.
- **In-Person Distribution**—CAHPS guidelines do not recommend in-person distribution of CAHPS surveys at the point of care due to its potential for low response rates, possible threats to patient confidentiality, and susceptibility to bias with selective distribution of surveys. A potential area for future research is to measure the impact of using in-person kiosks or on-site tablets, instead of physical distribution of paper surveys, on response rates and data quality.
- **In-Person Interviews**—In-person interviews are a very expensive method, but they increase both response rates and the representativeness of respondents beyond traditional mail and phone. Future research could undertake an analysis of the cost-benefit tradeoff of using in-person interviews as a follow-up to mailed CAHPS surveys instead of, rather than in addition to, phone follow-up.

Survey Format and Design

- **Survey Length**—Limited evidence suggests that compressing a paper CAHPS survey from 12 to 4 pages when following CAHPS survey guidelines can reduce costs without causing differences in response rates or survey scores, but further research is necessary to confirm. In addition, experimental studies are needed to determine whether CAHPS survey items can be removed without changing overall survey scores, and if so, whether this survey shortening improves response rates without compromising measurement comparability.
- **User-Friendliness/Low Literacy Formatting**—Preliminary results suggest that various user-friendly formatting changes improve CAHPS response rates in Medicaid recipients. More research can identify which of these changes are particularly helpful, and whether these benefits extend beyond the Medicaid population.

Incentives

- Research has found that even small incentives improve response rates. However, there is limited research on the use of incentives with CAHPS surveys. Further research on incentive amounts, incentive types (e.g., cash vs. gift cards), and comparisons of pre-paid and promised incentives are needed, as well as investigation of the potential for bias in survey results.

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