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Does a Web-first Tailored Design Method Work with Rural Populations?

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Cover Page Footnote

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ABSTRACT

Considering rural populations are historically difficult to reach, an important component of this research revolves around improving survey techniques in rural areas. To address this issue, a web-first Tailored Design Method (TDM), utilizing a mixed-mode of internet and postal mail surveys, was adapted to research the quality of life experienced by rural families. Aided by the Iowa State University Center for Survey Statistics and Methodology – Survey Research Services, data were collected from 62 rural counties in Arkansas. Socioeconomic-demographic factors were examined regarding survey response mode (i.e. mail vs. web) with some differences found. Logistic regression results demonstrated males were less likely to use web only responses compared to females. Similarly, higher education and income levels were associated with an increased likelihood of utilizing web response methods opposed to the mail-only response mode. Overall, the web-first TDM approach seems effective for garnering responses from harder to reach populations and should be considered when surveying rural populations.

KEYWORDS

Mail vs. web surveys, rural populations, survey methods, tailored design method, web-first

INTRODUCTION

Electronic web-based survey distribution techniques have offered an important resource for researchers. Numerous benefits have been identified as reasons for increased web-based survey usage (Dillman 2006; Dillman, Smyth, and Christian 2014; Fricker and Schonlau 2002; Israel 2013; Karras and Tufano 2006; Smyth et al. 2010). These benefits included faster response rates, reduced costs, automated data collection, interactive or tailored formats, convenient access to samples, and access to larger samples (Converse et al. 2008; Fricker and Schonlau 2002; Kaplowitz, Hadlock, and Levine 2004; McPeake, Bateson, and O'Neill 2014). However, limitations to web-based survey implementation also exist (Couper 2000). Previous research suggests that a drawback to web-based surveys includes lower response rates when compared to more traditional approaches (e.g. mail surveys) (Fan and Yan 2010; Manfreda et al. 2008). Additionally, a complete list of email addresses for the general population may not exist, thus limiting selection samples to which researchers can send web-based surveys (Schonlau and Couper 2017). Researchers could, however, reach multiple samples utilizing this method (e.g. college students, members of professional associations, registered users of web services, etc.). Lists for these individuals already exist and have been useable for web-based surveys for the last 20 years (Fricker and Schonlau 2002; Schonlau and Couper 2017).

To address low response rates from web-based surveys, researchers have started using mixed-mode approaches (Dillman 2006; Dillman et al. 2014; Chaudhary and Israel 2016; Messer and Dillman 2011; Stern, Bilgen, and Dillman 2014) where individuals are contacted through multiple means – web-based, mail, or telephone – and several studies have shown these methods moderately increase response rates (Converse et al. 2008; Couper 2000; Kaplowitz et al. 2004; Schonlau and Couper 2017). In Fricker and Schonlau's (2002) review of literature about utilizing web-based survey methods, they note that studies incorporating these methods target populations already having known email addresses and access to the internet. In a systematic review of literature by Manfreda et al. (2008), the researchers note that, on average, web-based surveys yielded a response rate 11 percent lower than other survey modes. Similarly, Fan and Yan (2010) indicate a common challenge to using web-based surveys is loss of participants due to a lack of internet in various regions. The question of how to reach populations, such as rural ones, that have less access to the internet than urban populations (Reddy and Bell 2004) or have greater limitations with internet access due to poor

connection related to geographical locations (Stern, Adams, and Elsasser 2009), is then raised. In 2015 the National Telecommunications and Information Administration (NTIA) reported that about 69 percent of Americans living in rural areas used the internet, compared to 75 percent of urban residents (NTIA 2019). About 31 percent of rural Americans did not utilize the internet as of 2015; these numbers have since decreased over the subsequent years (NTIA 2019). An approximate four-point drop was seen in the percentage of non-internet users in rural America between 2015 and 2017. In 2018 the Pew Research Center reported about 22.0 percent of rural Americans are not online using the internet. This was about a 7-point drop from 2017 (Anderson et al. 2019; NTIA 2019). While these previous studies have primarily focused on overall response rate and method of highest return, Dillman et al. (2014) also demonstrated that web respondents are typically younger, have higher educations and lower incomes, and are less likely to be widowed than those who responded via mail-based surveys. In addition to examining the effectiveness of a web-first TDM in a rural setting, this study also seeks to confirm the socioeconomic-demographic characteristics of rural web-based respondents.

TAILORED DESIGN METHOD

Because rural populations are difficult to reach, an important component of research revolves around the effectiveness of survey techniques with rural populations. To address this issue, the Tailored Design Method (TDM), utilizing a mixed mode of internet and postal mail surveys (Dillman et al. 2014), has been adapted to research quality of life experiences of rural families. The Tailored Design Method, building from the previous Total Design Method, focuses on the design of surveys and the different modes of dissemination to decrease measurement error (Dillman 1978). This method provides researchers with guidelines for instrument (i.e. survey) development along with protocols for initial respondent contact, follow-up mailings, telephone follow-up, and incentives. Surveys are then tailored to fit the appropriate target populations in design as well as delivery method (Dillman 2000; Dillman et al. 2014). The TDM utilizes five contact protocols: (1) advance post card, (2) initial invitation, (3) reminder letters, (4) survey packet, and (5) reminder postcard. These five steps are the basis for the TDM and will be discussed in more detail in subsequent sections. Past research has found the TDM and other similar mixed-method approaches to be successful in moderately increasing overall participant response rates (Converse et al. 2008; Dillman et al. 2014;

Messer and Dillman 2011; Stern et al. 2014). This version of the TDM method emphasizes a web-first or web-push approach, in which the contacted individuals are urged to utilize the web-based survey, before a paper method is provided (Smyth et al. 2010). Past research has demonstrated that this web-first approach improves web and mail response rates (Millar and Dillman 2011). This study was intended to investigate if a web-first methodology would be effective in a rural setting.

METHODS

In 2015 the Center for Survey Statistics and Methodology – Survey Research Services (CSSM-SRS) at Iowa State University was contracted to collect data using address-based samples from the US Postal Service Delivery Sequence File, in the statewide Families in Arkansas – Strong, Thriving and Resilient (FASTR) project. As part of this project, rural communities in the state of Arkansas were divided into four regions, Coastal Plains, Delta, Highlands, and River Valley, because of known socioeconomic-demographic differences in the state (University of Arkansas System Division of Agriculture Research & Extension 2015). Areas defined as rural were based on the Rural Profile of Arkansas (2015) which developed its classifications from the long standing 1999 Census definitions of non-metropolitan and metropolitan (i.e. rural and urban). According to this method, any area with a population less than 65,000 is considered “rural” (University of Arkansas System Division of Agriculture Research & Extension 2015).

The sample consisted of 1,200 addresses initially, however about 24.8 percent ($n = 297$) were undeliverable. Out of the 903 remaining, 209 surveys were mailed back for a 23.1 percent eligible response rate. Approximately 60 percent of respondents had access to the internet at home, leading researchers to think a mixed-mode survey approach might be beneficial. Consequently, the primary objective of this study was to evaluate a mixed-mode (mail and web), web-first TDM approach (Dillman et al. 2014). More specifically, the objectives of this study examined the socioeconomic-demographic characteristics of respondents in rural communities and the effectiveness of a web-first TDM in obtaining surveys from these rural populations.

In the latter half of 2016, the CSSM-SRS was again contracted to collect data using address-based samples from the US Postal Service Delivery Sequence File in the statewide FASTR project. The following hypotheses were generated.

H1: Individually, socioeconomic-demographic and demographic variables will impact response mode.

H_{1a}: More specifically, women respond differently than men.

H_{1b}: Younger respondents respond more frequently using the web-based mode.

H_{1c}: Respondents with higher levels of education respond more frequently using the web-based mode.

H_{1d}: Marital status has an impact on survey response mode.

H_{1e}: Employment status has an impact on participant's survey response mode.

H_{1f}: Income level has an impact on response mode.

H₂: Collectively, socioeconomic-demographic factors of a rural population will contribute to the prediction of response mode.

Data Collection

The survey consisted of a 12-page “booklet” with approximately 100 questions covering a broad range of topics including tourism impact, family resiliency, and health. Selected socioeconomic-demographic questions were also included. Consistent branding of logos on all forms of communication was used to identify that the surveyor is with an established organization within the community (Dillman 2000; Dillman et al. 2014). The contact protocol was as follows: (1) advance postcards were distributed to alert residents that an invitation letter would be arriving soon; (2) invitation letters including a \$2 incentive and explaining the purpose of the project and how to access the online survey were sent; (3) reminder letters were sent to remind people to complete the online survey; and (4) survey packets offering a hard copy option for the survey were mailed. The survey packet (step 4) included a hard copy of the survey, an additional \$2 incentive, a postage paid return envelope, and a cover letter explaining the survey's purpose (Messer and Dillman 2011). Finally, as outlined by Dillman et al. (2014) and Stern et al. (2014), a mailed reminder postcard (5) prompting respondents to complete the hard copy survey was also sent.

The advanced postcard was sent to 3,000 sampled households across 62 rural counties on April 5, 2017. About 10.5 percent were deemed undeliverable postcards/addresses by the US Post Office and were recorded as ineligible ($n = 314$). The invitation letter was sent to 2,686 eligible households with deliverable addresses on April 16, 2017. The initial invitation garnered 169 web-based responses, which was about 6.3 percent of the eligible sample. This amount comprised 20.8 percent of

total responses ($n = 812$) at the conclusion of data collection. Reminder letters were mailed to 2,517 eligible non-responding households with deliverable addresses on May 1, 2017, and 118 web-based survey responses were collected resulting in 4.7 percent of the eligible sample being collected. This was an additional 14.5 percent of total responses being web-based. Survey packets were mailed to the remaining 2,399 eligible non-responding households with deliverable addresses on May 18, 2017, and only 6 (0.3 percent) of the eligible sample’s initial mail-based surveys were collected before the next reminder was sent seven days later. The final reminder postcard mailing was sent to 2,393 eligible households with deliverable addresses on May 25, 2017. After the final reminder postcards were sent out, an additional 456 (19.1 percent) mail-based surveys and an additional 63 (2.6 percent) web-based surveys were returned between May 25 and August 2, 2017. The newly acquired mail-based surveys accounted for another 56.2 percent of the total sample collected, while web response surveys accounted for about an additional 7.8 percent of the total eligible returned sample (Table 1).

Throughout the data collection process, CSSM-SRS staff monitored and recorded the receipt of complete surveys. Any letters or survey packets returned unopened were subsequently opened and the \$2 incentive retrieved. Complete surveys were received from April 21, 2017 through August 2, 2017.

Table 1: Survey Contact Protocol Return Amounts (Arkansas, 2017)

	Date Sent	Mailed	Undeliverable	Online Survey Received	Paper Survey Received
Advance Postcard (1)	April 5	3,000	314	-	-
Invitation Letter (2)	April 16	2,686	-	169	-
Reminder Letter (3)	May 1	2,517	-	118	-
Survey Packet (4)	May 18	2,399	-	-	6
Reminder Postcard (5)	May 25	2,393	-	63	456
Closing Date	August 2	Total	314	350	462

Participant Characteristics

Completed surveys were received from 812 respondents with 350 (43.1 percent) coming from online surveys and 462 (56.9 percent) from the paper survey. Response rates for completed surveys have been calculated as the percentage of surveys completed out of the eligible (deliverable) sample. The overall response rate was 30.2 percent. Response rates for the regions ranged from 26.4 percent in the Delta region to 33.3 percent in the Highlands region, indicating adequate state-wide participation (see Table 2). The sample was primarily comprised of female participants accounting for 58.9 percent ($n = 465$) of respondents and 41.1 percent ($n = 325$) male participants accounting for the remainder. The participant ages ranged from 20 to 105 years of age (birth years 1913-1998), with a median age of 57.5. About 62.4 percent of participants in the sample were married ($n = 546$), and the remaining 35.6 percent identified as single never married, separated or divorced, and/or widowed ($n = 292$). About 61.0 percent of participants had household incomes less than \$50,000 ($n = 445$), while the remaining 49.0 percent had incomes over \$50,000 ($n = 281$). About 91.2 percent of the sample population were predominately white ($n = 707$), with the remaining sample consisting of African Americans (7.7 percent) and minuscule representations for Hispanics, Asians, and American Indians.

Table 2: Sample Size, Number of Cases by Outcome, and Response Rates by Region (Arkansas, 2017)

	1 Coastal Plains	2 Delta	3 Highlands	4 River Valley	Total
Sample	489	712	968	831	3000
Mailings returned as undeliverable	56	79	104	75	314
Eligible Sample	433	633	864	756	2686
Refused	2	5	10	6	23
No Response	302	461	566	523	1852
Total Completed	129	167	288	227	812
Response Rate	29.8%	26.4%	33.3%	30.0%	30.2%

RESULTS

To address the first hypothesis, two-way contingency table analyses using crosstabs were used to check for any significant differences, as well as to compare proportions between population demographics (e.g. gender, age, education, marital status, employment status, and income level), and response mode (i.e. mail vs web-survey; mail = 0, web = 1). Response

mode was the dependent variable for all analyses performed. Gender (i.e. male and female) and response mode were found not to be significantly related, Pearson $\chi^2(1, n = 790) = 2.80, p = .094$, Cramér's $V = .06$. Females were more likely to respond with the mail option (60.4 percent) than males (54.5 percent), while males were more likely to respond with the web option (45.5 percent) compared to females (39.6 percent). Thus, hypothesis 1a was not supported. To test hypothesis 1b, age was transformed into four groups with about 20 year intervals to provide groups with sufficient members for analysis (Group 1: ages 20-40, $n = 104$; Group 2: ages 41-60, $n = 259$; Group 3: ages 61-80, $n = 343$; Group 4: ages 81 to 105, $n = 56$). Age and response mode were found to be significantly related, Pearson $\chi^2(3, n = 762) = 33.73, p < .001$, Cramér's $V = .21$. About 63.5 percent of respondents in Group 1 (ages 20 to 40) were more likely to respond using the web option, compared to the 47.1 percent of Group 2 (ages 41 to 60), 37.9 percent of Group 3 (ages 61 to 80), and 21.4 percent of Group 4 (ages 81 to 105). Younger respondents were more inclined to utilize the internet or web-based response method than older respondents, thus supporting hypothesis 1b.

Hypothesis 1c sought to test the relationship between response method and education level. A two-way contingency table analysis was conducted to evaluate whether rural individuals responded with the mail or web-survey based on their education level. The two variables were education level of rural residents with six levels (Grades 1 to 11; High School Diploma or GED; Some College; Associate Degree; Bachelor's Degree; and Master's Degree or Higher) and response mode with two levels (Mail and Web). Response mode and education level were found to be significantly related, Pearson $\chi^2(5, n = 775) = 61.69, p < .001$, Cramér's $V = .28$. The percentage of rural residents with one of the following levels of education (i.e. Grades 1 to 11; High School Diploma or GED; Some College; Associate Degree; Bachelor's Degree; Master's Degree or Higher), responding with the mail option were 90.2 percent, 70.3 percent, 51.9 percent, 50.6 percent, 4.3 percent, and 39.1 percent, respectively, while the percentage of those responding with the web option were 9.8 percent, 29.7 percent, 48.1 percent, 49.4 percent, 57.0 percent, and 60.9 percent, respectively. Individuals who only completed grades 1 through 11 were more likely to respond with the mail option (90.2 percent), than High School Diploma or GED (70.3 percent), Some College (51.9 percent), Associate Degree (50.6 percent), Bachelor's Degree (43.0 percent), and Master's Degree or Higher (39.1 percent). Similarly, those with some form of college education, especially those with at least a bachelor's degree,

appear to be more likely to use a web response method (57.0 percent) than those without some level of college education, supporting hypothesis 1c.

Hypothesis 1d examined the relationship between marital status and survey response method utilizing two-way contingency table analysis. The variable marital status had four levels (Single never married, Married, Separated or Divorced, and Widowed), while the variable response mode had two levels (Mail and Web). Marital status and response mode were found to be significantly related, Pearson $\chi^2(3, n = 777) = 12.59, p = .006$. Cramér's $V = .13$. Those who were widowed were more likely to respond with the mail method (72.3 percent) than those who were single never married (54.1 percent), those who were married (53.6 percent), and individuals who were separated or divorced (60.0 percent). Individuals who were married were the most likely to respond with the web option (46.4 percent), compared to single never married (45.9 percent), separated or divorced (40.0 percent), and widowed (27.7 percent). From these results, it appears as though marital status does play a part in response mode selection, supporting hypothesis 1d.

Similarly, hypothesis 1e tested the relationship between employment status and survey method and was also found to be significantly related, Pearson $\chi^2(6, n = 778) = 37.94, p < .001$, Cramér's $V = .22$. Employment status contains seven levels: full or part time ($n = 339$), temporarily laid off ($n = 6$), unemployed ($n = 18$), retired ($n = 292$), caring for home or family ($n = 40$), student ($n = 5$), and disabled ($n = 78$). Based on their employment status (i.e. full or part time, temporarily laid off, unemployed, retired, caring for home or family, student, disabled), the percent of individuals who responded with the mail option were 46.3 percent, 66.7 percent, 61.1 percent, 66.4 percent, 47.5 percent, 20.0 percent, and 71.8 percent, respectively. The percent of individuals who responded with the web method based on their employment status were 53.7 percent, 33.3 percent, 38.9 percent, 33.6 percent, 52.5 percent, 80.0 percent, and 28.2 percent, respectively. Students were the most likely to respond with the web option (80.0 percent) compared to any other employment status. Similarly, those in full or part time employment were the next most likely to respond with the web option (53.7 percent) than the other employment statuses, while those who were disabled were the most likely to respond with the mail option (71.8 percent) compared to any other employment status, followed by those who were temporarily laid off (66.7 percent). These results indicate employment status does have an impact on the selected method of survey response.

Hypothesis 1f sought to analyze the relationship between income level and survey response method utilizing a two-way contingency table analysis. The relationship between income level and response method was significant, Pearson $\chi^2(5, n = 726) = 44.60, p < .001$, Cramér's $V = .25$. Based on their income levels (i.e. Less than \$20,000; \$20,000 up to \$30,000; \$30,000 up to \$50,000; \$50,000 up to \$75,000; \$75,000 up to \$100,000; More than \$100,000), the percent of individuals who responded with the mail response mode were 73.8 percent, 64.6 percent, 57.7 percent, 46.7 percent, 34.4 percent, and 46.3 percent, respectively. While the percent of web-based responses were 26.2 percent, 35.4 percent, 42.3 percent, 53.3 percent, 65.6 percent, and 53.7 percent. From these results it can be inferred that those with higher household incomes before taxes in 2016 responded more frequently with the web-survey option compared to those with lower total incomes. Similarly, those with lower incomes (e.g. Less than \$20,000) were more likely to respond with the mail option (73.8 percent) than any other income bracket. These findings contrast with those by Dillman et al. (2014), who found respondents from lower incomes responded more readily through the internet or web than mail.

Hypothesis 2 sought to analyze socioeconomic-demographic variables' ability to accurately predict response mode. Logistic regression was conducted to ascertain the effects of age, gender, education, marital status, employment status, and income (i.e. socioeconomic-demographic information) on the likelihood that participants utilized a mail or web response mode. The logistic regression was statistically significant overall (-2 Likelihood = 872.96, $\chi^2(6) = 87.82, p < .001$). The Hosmer and Lemeshow test indicated that there was not enough evidence to conclude that the model does not fit the data $\chi^2(8), p = .811$. The model explained 15.8 percent (Nagelkerke R^2) of the variance in response method and correctly classified 64.9 percent of cases. Of the predictors, age, gender, education, and income were all found to be statistically significant in determining the likelihood of response method (Table 5). Results for gender suggest males are likely to utilize the web only response method about 50.6 percent of the time compared to females. For age, each additional year of age reduces the odds of utilizing the web response method by about 4.0 percent. Age was not transformed into four groups for this analysis; it was instead used as a single variable containing ages 20 to 105. A higher education level (i.e. a college degree) was associated with an increased likelihood of utilizing web response methods. Similarly, higher income was associated with an increased likelihood of utilizing a

web response method. Overall, it appears that the likelihood of using a web-response method fluctuated in relation to age, gender, education, and income.

Table 3: Regression Coefficients and Odds Ratios for Socioeconomic-demographic Variables (Arkansas, 2017)

	<i>B</i>	<i>Wald</i>	<i>df</i>	<i>p</i>	<i>Odds Ratio</i>
Age	-0.030	23.390	1	0.001**	0.959
Gender	-0.348	4.170	1	0.041*	0.506
Education	0.246	14.990	1	0.001**	1.129
Marital Status	0.063	0.300	1	0.584	0.851
Employment Status	-0.020	0.199	1	0.656	0.896
Income	0.175	8.540	1	0.003**	1.059

Note: A single asterisk indicates significance at the .05 level, while a double asterisk indicates significance at the .01 level.

Interestingly, gender was found to be significant in the multivariate analysis. This might be partially attributed to the relationship between the independent variables and the presence of weak correlations, the strongest of which was an r of .13. The variance inflation factor (VIF) was examined to identify potential issues with multicollinearity. Moderately weak relationships were found (Gender = 1.06; Age = 1.33; Education = 1.24; Marital Status = 1.26; Employment Status = 1.32; and Income = 1.44). These relationships might explain the differences between bivariate and multivariate results and should be studied further.

DISCUSSION

This study sought to examine if a web-first TDM could be implemented to effectively collect data from one of the more difficult to reach populations, residents in rural areas. Building upon a previous, smaller-in-scale study conducted by the authors using a mail-only survey option in selected rural areas in a single U.S. state, the addition of an online component in the web-first TDM was effective in obtaining responses online from rural areas. The use of an *advanced postcard* to alert residents that an invitation letter would be arriving, followed by an *invitation letter* with a \$2 incentive to complete the survey online along and instructions about accessing the online survey, followed by a *reminder letter* to complete the online survey, and a *survey packet* containing a hard copy of the survey and another \$2 incentive with a postage paid return envelope appear to have increased response rates relative to the earlier study. Although the web-first TDM does take more time and effort as a mixed-mode survey

distribution method, this research demonstrates that it can be used in an effective manner when surveying rural populations and thus should be considered when attempting to survey rural populations.

From these results, we speculate that multiple variables play a part in the preferred response method. Age, for example, demonstrates that older participants favor mail responses as opposed to younger respondents who favored web response methods. Similarly, those who are retired, a more common occurrence for people in later years, also favor mail response methods compared to students and those working full or part time, who preferred web response methods. These variables could be related, and use of multivariate analyses is recommended for future research to examine these relationships. Older participants also had higher odds of utilizing mail response methods, while younger participants had higher odds of using web-based response methods. These results are supported by Messer and Dillman's (2011) findings that suggest mail surveys generate inadequate results among younger people.

As previous studies (Dillman et al. 2014; Fricker and Schonlau 2002; Kaplowitz et al. 2004) show, web-based responses are greater for those with a college education since computer use and email are generally required during college, which increases computer literacy. This study also found the odds of using a web-based response to be higher for those with higher educational attainment and income. Individuals with higher incomes may have more access to computers at their jobs or have the funds to buy home computers. This could enable them to respond more easily via web and increase their willingness to respond with that method when compared to others who may not be able to afford such luxuries due to lower incomes. The information presented here can be used to help future researchers ascertain the method or methods that work best for garnering survey responses from their target populations. It is advisable for these methods to be based on socioeconomic-demographic characteristics, especially as access to broadband internet expands to rural areas of the U.S. Tailoring survey response methods to meet the needs of the population of interest can aid in increasing response rates. This research suggests that a sequential approach utilizing web then mail can be effective in rural settings and should be considered when acquiring data from other populations.

CONCLUSIONS

This study focuses on the effectiveness of a web-first TDM in obtaining surveys from rural populations and identifying demographic differences

between mail and internet respondents. Although this method has been found to be effective in obtaining surveys from rural populations, additional time, effort, and money are necessary for it to succeed. For those unable to secure funding, this method may not be as effective because of the need for multiple \$2 incentives. This study suggests potential advantages associated with mixed-mode survey methods, but those advantages must also be considered in relation to the cost of implementing this method.

These findings, however, are limited due to the lack of an experimental design in which a web-first sample and mail-only treatment group are randomly assigned to the population. Without this randomization the results are confounded and the conclusion of a web-first approach successfully increasing response rates cannot be generalized. Future research should strive to assess not only rural populations' access to web-based options, but also preferred communication methods (i.e. mail or web) in order to better tailor surveys and generate results that allow for a clear explanation as to why one survey response method is chosen over the other.

These findings help to support the underlying notion of the TDM approach, namely, that surveys need to be tailored to fit the intended appropriate populations in both design and delivery methods (Dillman 2000; Dillman et al. 2014). Understanding the intended population's characteristics could help in the creation and implementation of survey methods to garner higher response rates. The use of a mixed-mode survey approach and whether to push web or mail first could be a defining factor in the success of a research initiative. This study helps to affirm that examining a population's socioeconomic-demographic characteristics can help the effectiveness of obtaining surveys in rural communities. The web-first TDM should also be considered when targeting other potentially difficult to reach populations, such as those in developing countries, since internet usage and availability in those countries is steadily increasing (Poushter 2016).

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