

The Impact of Efforts to Increase Response Rates on Survey Estimates

Federal Committee on Statistical Methodology

Karen K. Wessels, MA

Frances M. Barlas, PhD

The opinions and conclusions presented herein are those of the authors and do not necessarily reflect the opinions of the Department of the Army.

Previous Research on Nonresponse Bias

- **Survey response rates have been steadily declining over the last several years, bringing into question the validity of data collected.**
- **In an attempt to counteract declining response rates, researchers have invested in:**
 - **Longer fielding periods,**
 - **Increased survey reminders, and**
 - **More than one survey mode.**
- **However, research suggests that an increase in nonresponse does not necessarily produce nonresponse bias (Groves et al., 2006).**

Previous Research on Nonresponse Bias

- **Groves and Peytcheva (2008) conducted a meta-analysis of 59 studies designed to estimate the magnitude of nonresponse bias on statistics of interest**
- **Predictors included:**
 - **Design features of the survey**
 - **Characteristics of the sample, and**
 - **Survey statistics computed.**
- **Although high response rates can reduce the risk of bias, their most common finding was that high response rates are less likely to reduce the risk of bias when the motivation to participate (e.g., based on the survey topic) is highly correlated with the survey variables.**

Introduction

Previous Research on Nonresponse Bias

- **The Pew Research Center has conducted extensive research on the impact of declining response rates on survey estimates and found that higher response rates may produce little to no difference in survey results.**
 - **Estimates from a 5-day survey using “standard” methodology were compared with estimates from a survey**
 - **The “rigorous” methodology, administered for 21 weeks included additional procedures to increase response rates, such as:**
 - **Advance letters**
 - **Refusal conversion letters**
 - **Monetary incentives.**
 - **The rigorous methodology led to a significantly higher response rate compared to the standard methodology - 50% vs. 25%.**

Previous Research on Nonresponse Bias (Cont.)

- Although the more rigorous methodology resulted in higher response rates, the survey estimates were about the same (Keeter et al., 2006).
- Estimates for 77 out of 84 comparable items from the standard and rigorous methodology were not statistically different.
- Results for the 2012 study (Kohut et al., 2012), which examined 40 survey estimates, were similar:

Number of Estimates	Percentage Point Difference between Standard vs. Rigorous Methodology
28	2 percentage points or less
7	3 percentage points
5	4 percentage points

Introduction

Methodology

- **Some nonresponse research focuses on early versus late responders to determine whether the two groups are statistically different, thus indicating higher nonresponse bias if the late responder data were not collected (Irani, T. A. et al., 2004, Paganini-Hill et al., 1993, Vink, J. M. & Boomsma, D. I., 1993).**
- **Other nonresponse studies focus on comparing early responders with all respondents to determine whether additional efforts to increase response rates led to statistically different results (Groves, R. M., 2006 and Millar, M. M. & Dillman, D. A., 2011).**

Introduction

Methodology

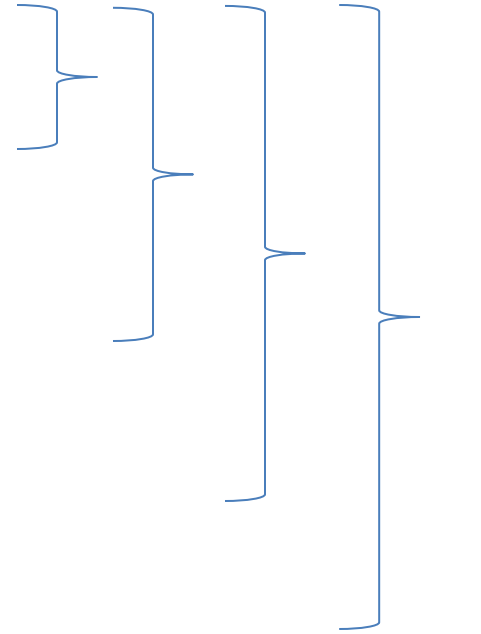
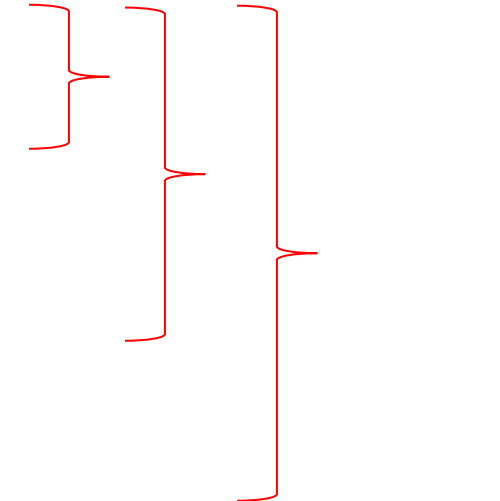
- **The current study compares early responders with all respondents to determine whether additional efforts (e.g., email and USPS reminders) to increase response rates to a dual-mode Army survey (web and paper) impacted survey estimates.**
- **Specifically, the current research investigates whether survey estimates would have been statistically different if the survey had been closed earlier with a lower response rate.**
 - **Due to potential mode effects, web and paper responses were analyzed separately.**
 - **Results are analyzed by the four patron groups: active duty members, spouses of active duty members, retirees, and civilians.**
 - **20 survey items were analyzed for differences in survey estimates based on the various data collection cut-off dates.**

2012 Army Morale, Welfare, and Recreation (MWR) Services Survey Methodology

- **Mixed mode survey (Web and Paper) fielded from March 2012 – May 2012**
- **Stratified random sample**
 - **Patron Group (Strata: active duty, spouse, retiree, civilian)**
 - **Army Garrisons (75 Army sites)**

	Active Duty	Spouse	Retiree	Civilian	Total
Population	460,994	220,259	234,829	153,162	1,069,244
Sample Size	74,274	63,844	64,708	69,585	272,411
Useable Responses	6,628	9,372	25,309	15,412	56,721
Overall Response Rate	10.7%	14.7%	34.2%	31.0%	22.9%

2012 Army MWR Services Survey Schedule

Pre-notification email	Feb 29 – Mar 6	Web analysis break outs 	Paper analysis break outs 
Email announcement	Mar 12 – Mar 16		
Email reminder	Mar 19 – Mar 23		
Mail Out Packages¹	Mar 23 – Apr 4		
2nd email reminder	Mar 29 – Apr 4		
USPS reminder²	Apr 9 – Apr 19		
2nd Mail Out Packages	Apr 18 – Apr 24		
2nd USPS reminder**	May 2 – May 11		
Close date	May 24		

¹ Included URL and password and a paper copy of the survey

² Included URL and password

2012 Army MWR Services Survey Methodology

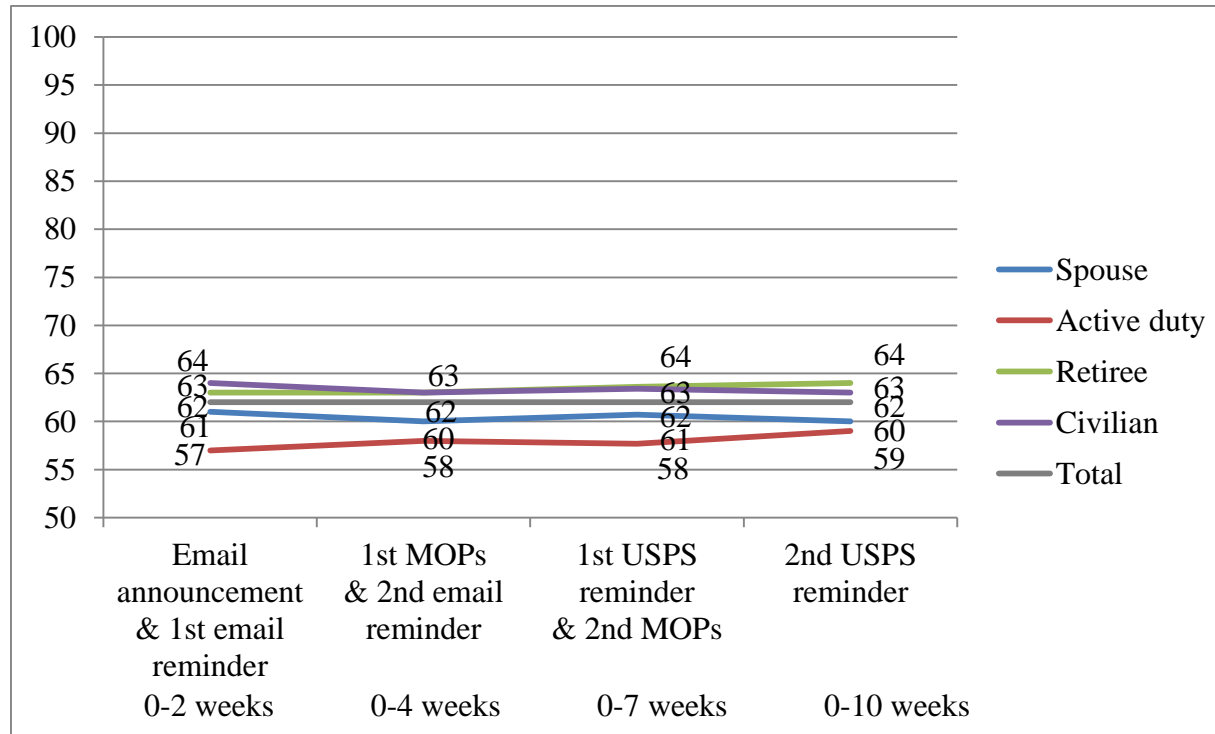
Period of data collection	Tools to obtain responses	Web		Paper	
		N	% of web responses	N	% of paper responses
0 to 2 weeks	Email announcement 1 st email reminder	10,765	33%		
2 to 4 weeks	1 st Mail Out Packages 2 nd email reminder	11,039	34%	10,772	45%
4 to 7 weeks	1 st USPS reminder 2 nd Mail Out Packages	7,657	23%	8,406	35%
7 to 10 weeks	2 nd USPS reminder	3,329	10%	4,725	20%
		32,790 ¹		23,903	

- **Two-thirds (67%) of web respondents submitted their data during the first 4 weeks of web data collection.**
- **Four-fifths (80%) of paper respondents submitted their data during the first 5 weeks of the paper data collection.**

¹ 58% responded using the web survey.

Note: The email announcement with instructions on how to complete the web survey began on March 12, 2012; mailing of the first Mail Out Packages (MOPs) for the paper survey began on March 23, 2012. Thus, data were collected via web ~2 weeks longer than via paper.

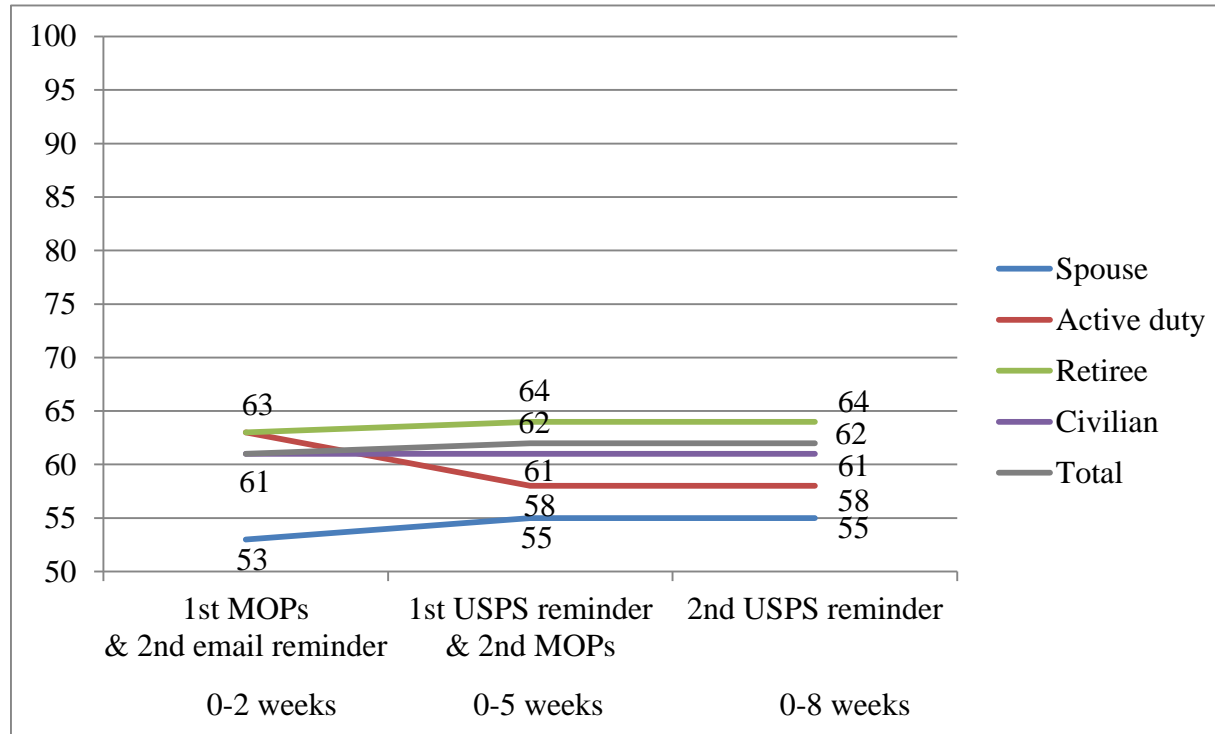
Percent Satisfied With Army Family and MWR Programs at Installation by Patron Group Web



- Satisfaction with Army Family and MWR programs was asked of all respondents

Maximum difference in estimates by patron group		
0-2 weeks vs. full administration	0-4 weeks vs. full administration	0-7 weeks vs. full administration
2	1	1

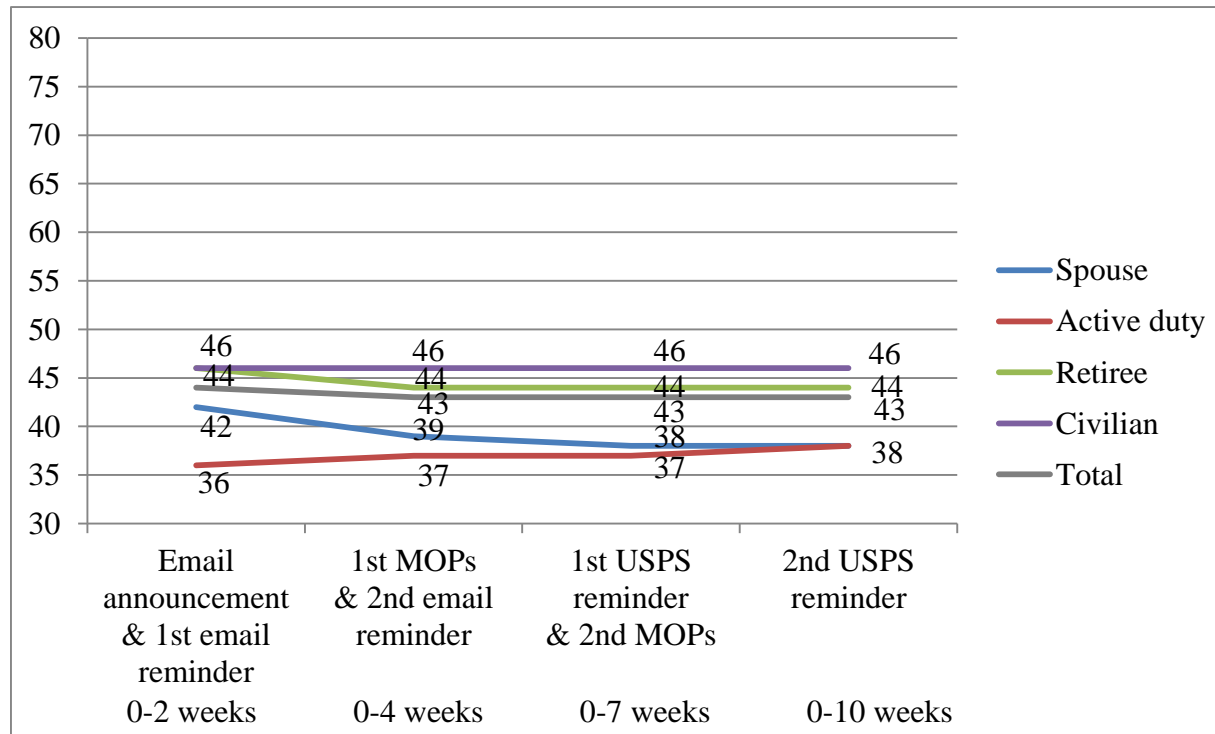
Percent Satisfied With Army Family and MWR Programs at Installation by Patron Group Paper



- Satisfaction with Army Family and MWR programs was asked of all respondents

Maximum difference in estimates by patron group	
0-2 weeks vs. full administration	0-5 weeks vs. full administration
5	0

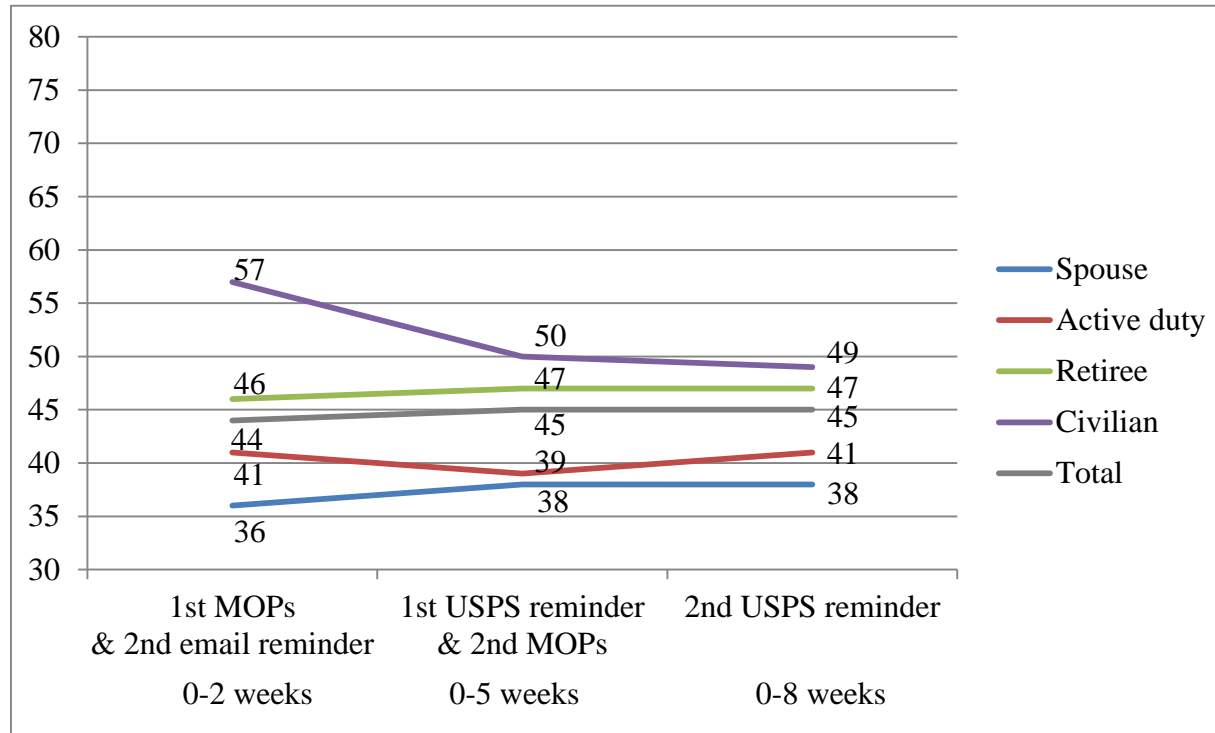
Percent Satisfied With Family and MWR Army Entertainment by Patron Group Web



- Respondents could indicate Family and MWR Army Entertainment was not available/not applicable to them; 79% of web respondents provided an eligible response.

Maximum difference in estimates by patron group		
0-2 weeks vs. full administration	0-4 weeks vs. full administration	0-7 weeks vs. full administration
4	1	1

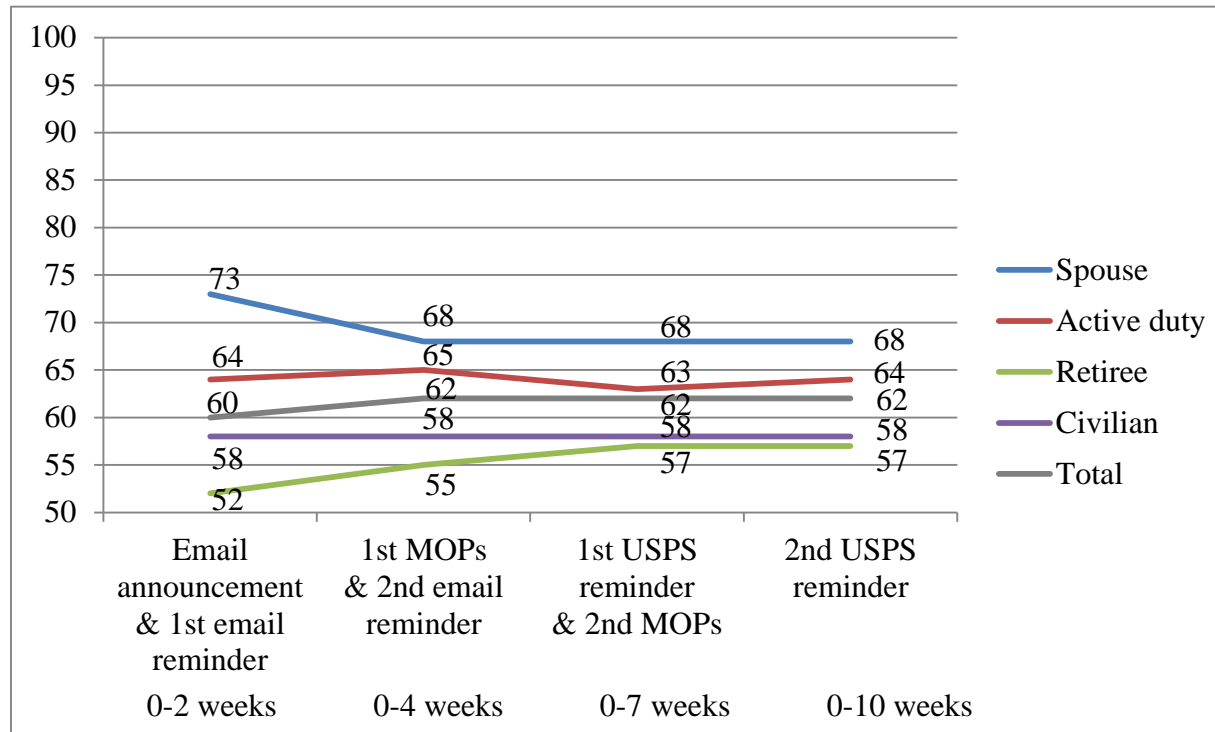
Percent Satisfied With Family and MWR Army Entertainment by Patron Group Paper



- Respondents could indicate Family and MWR Army Entertainment was not available/not applicable to them; 71% of paper respondents provided an eligible response.

Maximum difference in estimates by patron group	
0-2 weeks vs. full administration	0-5 weeks vs. full administration
8	2

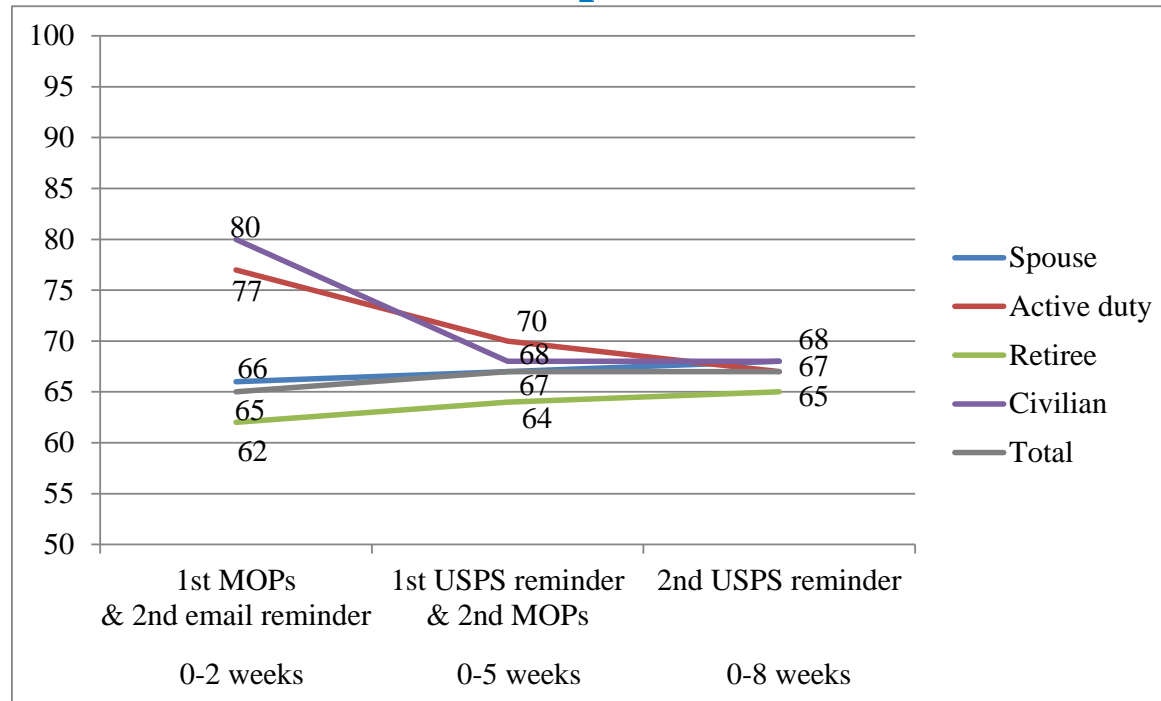
Percent Agree Army Child, Youth, and School Age Programs are a Valuable Benefit to me by Patron Group Web



- Agreement with Army Child, Youth, and School Age Programs being a valuable benefit was asked of respondents who indicated they have children under 18 who live with them; 27% of web respondents provided an eligible response.

Maximum difference in estimates by patron group		
0-2 weeks vs. full administration	0-4 weeks vs. full administration	0-7 weeks vs. full administration
5	2	1

Percent Agree Army Child, Youth, and School Age Programs are a Valuable Benefit to me by Patron Group Paper



- Agreement with Army Child, Youth, and School Age Programs being a valuable benefit was asked of respondents who indicated they have children under 18 who live with them; 19% of paper respondents provided an eligible response.

Maximum difference in estimates by patron group	
0-2 weeks vs. full administration	0-5 weeks vs. full administration
12	3

Findings and Conclusions - Web

Maximum difference between estimate from respective time period and full administration

0-2 weeks

0-4 weeks

0-7 weeks

10

2

1

- **Across the 20 measures analyzed, web survey estimates by patron group differed by 0 to 2 percentage points between estimates from data collected during the first 4 weeks of data collection and the full administration. However, these differences were not statistically significant.**
- **Differences were between 0 and 1 percentage points between estimates from data collected during the first 7 weeks of data collection and the full administration.**
- **Differences were much larger, up to 10 percentage points, between estimates from data collected during the first 2 weeks of data collection and the full administration.**
 - **Differences tended to be largest for spouses for the 2-week to full administration comparison.**

Findings and Conclusions - Paper

Maximum difference between estimate from respective time period and full administration	
0-2 weeks	0-5 weeks
15	3

- **Across the 20 measures analyzed, paper survey estimates by patron group differed by 0 to 3 percentage points between estimates from data collected during the first 5 weeks of data collection and the full administration. However, these differences were not statistically significant.**
- **Differences were much larger, up to 15 percentage points, between estimates from data collected during the first 2 weeks of data collection and the full administration.**
 - **Differences tended to be largest for active duty and civilian respondents for the 2-week to full administration comparison.**

Findings and Conclusions

Web

- **Estimates stabilized after 4 weeks into the web administration and a 15% response rate.**
- **Thus, a web administration of this population that achieves a response rate of at least 15% is necessary; fewer email and USPS reminders may be used to achieve this.**
- **Data collected beyond this was shown to have little to no impact on survey results.**

Paper

- **Estimates stabilized after 5 weeks into the paper administration and a 15% response rate.**
- **Thus, a paper administration of this population that achieves a response rate of at least 15% is necessary; fewer email and USPS reminders may be used to achieve this.**
- **Data collected beyond this was shown to have little to no impact on survey results.**

Limitations

- **Power!** This study had a great deal of power. The findings of this study may have been different with lower sample sizes. Even after just two weeks into the administration of each mode, there were ~11k respondents in each mode.
 - A survey with a smaller sample would have less power, thus potentially suffering from very large margins of error with lower response rates.
- Respondents could choose between modes, thus we had no way of knowing what motivated their participation (e.g., a mail out package with a paper copy of the survey may have reminded a participant to fill out the survey online).

Thank you!

Karen Wessels

Karen.Wessels@icfi.com