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Comparison of Paper, Web, and IVR Responses in the Veterans Health Administration Survey

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Keywords: survey practice

<https://doi.org/10.29115/SP-2010-0021>

Survey Practice

Vol. 3, Issue 5, 2010

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The Veterans Health Administration (VHA) All Employee Survey (AES) is a voluntary, confidential annual survey of employee job satisfaction and employee perceptions of workplace climate. Survey researchers (e.g., Rogelberg and Stanton 2007; Stocke 2006) recommend offering several response modes to a survey. This serves to increase participation of different demographic groups and obtain results that adequately represent them all. The practice of offering Web, Interactive Voice Response (IVR) and paper response options has been adopted for the AES, but the majority of respondents across the survey years consistently choose the Web (over 75% since 2004, over 90% since 2008). The AES thus can be seen as predominantly a Web survey. The data obtained in all of the three modes are combined prior to analyzing and reporting the results. The objective of this paper was to examine if respondents selecting each of the modes differed in demographic characteristics, in how many questions they answered, and in the answers they gave.

The AES serves to systematically track employee perceptions of the organization, communicate them clearly between employees and management, and then to hold leaders accountable for articulating action plans and implementing improvements informed by the results of the system assessments (Young 2000). AES results are broadly disseminated within the organization and included in action plans at all of the VHA facilities, at the regional level, and nationally. Performance standards for VHA managers and executives require broadly sharing AES results with their workforce and planning specific improvements based on the survey information. Such an important organizational role of the AES requires that the AES results be representative of the different demographic groups of employees.

Given the increased popularity of Web-based tools and the decreased use of paper surveys within organizations, we also examined how any differences changed over time. The AES dataset has several features generally rare in organizational surveys. These features include data for the same survey that are available for several years (2004, 2006, annually thereafter) and for several modes (paper, IVR, Web-based), for multiple local organizations (hospitals,

clinics, offices) all within the same organizational structure (VHA). In addition, the VA is the 2nd largest federal agency in the United States and its workforce is extremely broad and diverse. For example, the VHA AES workforce includes surgeons, policemen, engineers, canteen workers, pharmacists, photographers, clerks, designers and many other occupations, spread over all of the 50 states. AES ratings of the workplace environment thus reflect a rich variety of geographically, demographically and professionally different perspectives. We believe that these features of the AES dataset make for an informative comparison of survey results across administration modes. These results generalize to many contexts where organizational surveys are used.

Method

Data collection

The annual administration of the AES is preceded by an organization-wide marketing where all VHA employees are encouraged to take part in the AES. Through a single, widely distributed instruction document, employees receive detailed information on how to access each of the 3 modes: IVR, paper, and Web-based. Access to the Web-based questionnaire is through a URL maintained by a contractor. IVR access is through a toll free telephone number. Employees selecting the paper mode have to contact a site coordinator at each location to receive the questionnaire and a postage paid envelope to return it. In all cases, employees are given a 7-digit work group code to be entered on the questionnaire and are instructed to also enter an occupation code from a list. They are given assurance that responses would be confidential. The confidentiality of responses is strictly maintained throughout the data collection, analysis, and reporting processes. The AES is open for 3 weeks. After the survey closes, data are processed and reported to the organization within one month.

Data analysis

We calculated response rates using The American Association for Public Opinion Research (2008) RR2 method. Surveys with at least 80% of the non-demographic questions answered were considered 'complete', and surveys with at least 50 percent but less than 80% of the non-demographic questions answered were designated as 'partial'. Only 'complete' and 'partial' questionnaires appear in the numerator of the response rates. The denominator of the response rates was the total number of VHA employees at the time the survey was offered. We used Cohen's D (Cohen 1988) to calculate the effect size between Web-based versus IVR and Web-based versus paper modes for the 58 survey questions for all respondents and also for selected demographic subgroups. An effect size greater than or equal to 0.2 was considered to be of practical significance. We used the t-test ($p(t) \leq 0.05$) to

determine the statistical significance of mean differences between Web-based versus IVR and Web-based versus paper modes for the 58 survey questions for all respondents and for demographic subgroups.

Results

Overall, from 2004 through 2008, the number of completed AES questionnaires increased from 104,155 to 163,831 (Table 1). Response rates based on the number of VHA employees were 51.5%, 69.7%, and 72.4% for 2004, 2006, and 2008, respectively. During this interval, the proportion of respondents selecting IVR or paper modes decreased, and the proportion selecting Web-based surveys increased.

Mode preferences for demographic subgroups

For 2004, 2006, and 2008, males were more likely to select paper and less likely to select Web-based questionnaires than females. In 2004, males were less likely to select the IVR mode than females were, but more likely than females to select this mode in 2006 and 2008.

For all years, the less-than-20 age group selected the IVR mode much more frequently than the other age groups. For all years, selection of paper and IVR over Web-based modes tended to increase with age-group.

For all years, Hispanic respondents were more likely to select the IVR and paper modes and less likely to select the Web-based mode than non-Hispanics. These differences narrowed between 2004 and 2006 and again between 2006 and 2008.

Mode selection for the 6 racial classifications was variable among groups and over years. In general Blacks and American Indians were similar in their mode preference, as were Asians and Whites. Those respondents self-classifying as Multi-racial were much more likely to select IVR over the paper and Web-based modes.

Within years, mode selection was similar among groups based on length of time working at the VA and based on supervisory level.

For all years, there was little variation in mode selection among occupation groups except for wage grade employees (hourly paid occupations that typically do not require extensive professional training, such as housekeepers or canteen workers). Wage grade employees were much more likely to select the IVR and paper modes and less likely to select the Web-based modes than other occupation groups. These differences narrowed between 2004 and 2006 and between 2006 and 2008.

Table 1 Mode selection by respondents to the VHA All Employee survey in years 2004, 2006, 2008.

		2004							
		IVR		Paper		Web		Total	
		n	Row %	n	Row %	n	Row %		
Sex	All	13,958	13.40	9,750	9.36	80,447	77.24	104,155	
	Male	4,818	12.6	4,837	12.65	28,591	74.76	38,246	
	Female	8,274	13.05	4,632	7.3	50,516	79.65	63,422	
Age group (years)	<20	134	34.72	20	5.18	232	60.1	386	
	20–29	525	10.06	420	8.05	4,275	81.9	5,220	
	30–39	1,836	11.4	1,198	7.44	13,078	81.17	16,112	
	40–49	4,162	12.47	2,904	8.7	26,313	78.83	33,379	
	50–59	5,136	13.45	3,847	10.07	29,202	76.48	38,185	
	>=60	1,284	15.53	1,058	12.8	5,925	71.67	8,267	
Hispanic	Yes	1,137	15.3	1,172	15.77	5,122	68.93	7,431	
	no	11,910	12.79	8,155	8.75	73,087	78.46	93,152	
Race	American Indian	134	11.54	121	10.42	906	78.04	1,161	
	Asian	512	10	325	6.35	4,283	83.65	5,120	
	Balck	2,755	13.97	3,138	15.91	13,827	70.12	19,720	
	Multiracial	1,737	53.78	203	6.28	1,290	39.94	3,230	
	Native Hawaiian	57	7.85	75	10.33	594	81.82	726	
	White	7,091	10.49	2,506	7.7	55,278	81.8	67,575	
	Occupation gp	Administration	4,740	10.39	2,632	5.77	38,249	83.84	45,621
	MD	611	9.61	417	6.56	5,332	83.84	6,360	
Time with VHA	Nurse	3,874	14.71	1,328	5.04	21,134	80.25	26,336	
	Other clinical	1,544	12.3	769	6.13	10,238	81.57	12,551	
	Unknown	1,078	49.11	796	36.26	321	14.62	2,195	
	Wage grade	2,111	19.03	3,808	34.33	5,173	46.64	11,092	
	< 6 months	567	15.17	435	11.64	2,735	73.19	3,737	
	6–12 months	910	14.79	583	9.48	4,660	75.74	6,153	
	1–3years	1,729	11.1	1,436	9.22	12,409	79.68	15,574	
Supervisory level	4–5 years	1,096	12.07	767	8.45	7,216	79.48	9,079	
	6–10 years	1,709	12.76	1,232	9.2	10,453	78.04	13,394	
	11–20 years	3,958	13.04	2,775	9.14	23,630	77.82	30,363	
	>20 years	2,940	12.54	2,277	9.72	18,219	77.74	23,436	
	None	8,724	12.05	7,327	10.12	56,347	77.83	72,398	
	First line	2,448	17.48	1,079	7.7	10,479	74.82	14,006	
	Manager	990	12.34	611	7.62	6,422	80.04	8,023	

2004								
		IVR		Paper		Web		Total
		n	Row %	n	Row %	n	Row %	
Executive		571	9.49	321	5.34	5,122	85.17	6,014
Senior exec.		146	11.96	89	7.29	986	80.75	1,221
2006								
		IVR		Paper		Web		Total
		n	Row %	n	Row %	n	Row %	
Sex	All	12,527	8.54	8,251	5.63	125,848	85.83	146,626
	Male	4,664	8.67	3,925	7.29	45,216	84.04	53,805
	Female	7,220	8.29	3,065	3.52	76,830	88.19	87,115
Age group (years)	<20	171	41.5	23	5.58	218	52.91	412
	20–29	564	7.5	321	4.27	6,632	88.23	7,517
	30–39	1,542	7.06	771	3.53	19,515	89.4	21,828
	40–49	3,371	7.94	1,934	4.55	37,177	87.51	42,482
	50–59	4,880	8.79	3,065	5.52	47,594	85.69	55,539
	>=60	1,352	10.39	839	6.45	10,823	83.16	13,014
Hispanic	Yes	1,112	10.7	824	7.93	8,455	81.37	10,391
	No	10,757	8.34	6,007	4.66	112,171	87	128,935
Race	American Indian	27	1.93	83	5.92	1,291	92.15	1,401
	Asian	20	0.27	216	2.89	7,248	96.85	7,484
	Black	193	0.76	2,294	8.98	23,048	90.26	25,535
	Multiracial	11,010	76.31	122	0.85	3,296	22.84	14,428
	Native Hawaiian	25	2.2	74	6.5	1,039	91.3	1,138
	White	145	0.17	3,856	4.53	81,085	95.3	85,086
Occupation gp	Administration	4,068	6.58	1,998	3.23	55,752	90.19	61,818
	MD	630	6.67	355	3.76	8,465	89.58	9,450
	Nurse	3,478	8.83	1,431	3.63	34,500	87.54	39,409
	Other clinical	1,373	7.66	538	3	16,003	89.33	17,914

2004								
		IVR		Paper		Web		Total
		n	Row %	n	Row %	n	Row %	
Time with VHA	Unknown	199	33	404	67	0	0	603
	Wage grade	2,779	15.94	3,525	20.22	11,128	63.84	17,432
	< 6 months	557	11.42	270	5.53	4,052	83.05	4,879
	6–12 months	609	10.15	325	5.42	5,064	84.43	5,998
	1–3years	1,682	6.88	1,213	4.96	21,564	88.16	24,459
	4–5 years	1,071	7.49	699	4.89	12,530	87.62	14,300
	6–10 years	1,693	8.19	1,049	5.08	17,927	86.73	20,669
	11–20 years	3,326	8.68	1,850	4.83	33,147	86.49	38,323
Supervisory level	>20 years	2,878	8.8	1,590	4.86	28,234	86.34	32,702
	None	8,268	8.02	5,523	5.35	89,348	86.63	103,139
	First line	2,169	11.37	804	4.21	16,104	84.42	19,077
	Manager	763	7.56	392	3.89	8,931	88.55	10,086
	Executive	474	6.16	175	2.27	7,051	91.57	7,700
	Senior exec.	130	8.63	41	2.72	1,336	88.65	1,507
2008								
		IVR		Paper		Web		Total
		n	Row %	n	Row %	n	Row %	
Sex	All	8,334	5.09	3,913	2.39	151,584	92.52	163,831
	Male	3,564	6.03	1,764	2.98	53,791	90.99	59,119
	Female	4,361	4.42	1,079	1.09	93,319	94.49	98,759
Age group (years)	<20	107	26.03	13	3.16	291	70.8	411
	20–29	403	3.84	198	1.89	9,893	94.27	10,494
	30–39	1,038	4.01	280	1.08	24,553	94.91	25,871
	40–49	2,036	4.53	701	1.56	42,206	93.91	44,943
	50–59	3,228	5.5	1,201	2.05	54,216	92.45	58,645
	>=60	1,107	6.44	436	2.54	15,648	91.02	17,191
Hispanic	Yes	847	6.27	250	1.98	11,515	91.3	8,334
	No	7,067	4.93	2,534	1.77	133,692	93.3	151,584
Race	American	86	5.03	43	2.51	1,581	92.46	1,710

2004								
		IVR		Paper		Web		Total
		n	Row %	n	Row %	n	Row %	
Occupation gp	Indian							
	Asian	276	3.02	100	1.09	8,764	95.89	9,140
	Black	2,171	6.83	995	3.13	28,635	90.04	31,801
	Multiracial	976	19.32	53	1.05	4,024	79.64	5,053
	Native	30	2.11	40	2.82	1,349	95.07	1,419
	Hawaiian							
	White	3,833	3.76	1,486	1.46	96,509	94.78	101,828
	Administration	2,466	3.78	890	1.36	61,890	94.86	65,246
	MD	368	3.49	161	1.53	10,021	94.99	10,550
	Nurse	1,850	4.1	583	1.29	42,682	94.61	45,115
	Other clinical	812	3.75	213	0.98	20,642	95.27	21,667
Time with VHA	Unknown	137	35.49	249	64.51	0	0	386
	Wage grade	2,701	12.94	1,817	8.71	16,349	78.35	20,867
	< 6 months	481	5.26	211	2.31	8,447	92.43	9,139
	6–12 months	717	5.77	259	2.08	11,461	92.15	12,437
	1–3 years	1,076	4.1	514	1.96	24,658	93.94	26,248
	4–5 years	760	4.33	285	1.63	16,493	94.04	17,538
	6–10 years	1,252	4.92	451	1.77	23,731	93.3	25,434
	11–20 years	1,742	5.08	558	1.63	32,000	93.29	34,300
Supervisory level	>20 years	1,858	5.61	568	1.72	30,690	92.67	33,116
	None	5,685	4.85	2,269	1.93	109,377	93.22	117,331
	First line	1,366	6.71	312	1.53	18,667	91.75	20,345
	Manager	481	4.48	147	1.37	10,105	94.15	10,733
	Executive	283	3.39	69	0.83	7,990	95.78	8,342
	Senior exec.	66	3.95	25	1.5	1,578	94.55	1,669

Mode preference and number of demographic and non-demographic responses missing

In 2004, respondents selecting each of the 3 modes had similar patterns of the number of missing responses for the 7 demographic questions. In 2006 and 2008, however, respondents selecting the paper mode had a higher proportion of unanswered demographic questions than respondents selecting the IVR and Web-based modes (Figures 1–3).

Figure 1 Relative frequency of demographic questions missing out of 7, 2004 AES.

Figure 2 Relative frequency of demographic questions missing out of 7, 2006 AES.

Figure 3 Relative frequency of demographic questions missing out of 7, 2008 AES.

Figure 4 Percent of surveys with more than 5 non-demographic questions missing out of 58, AES.

For all years, respondents selecting the IVR mode had a higher proportion of questionnaires with more than 5 non-demographic questions missing out of 58 than respondents selecting Web-based surveys (Figure 4). Respondents selecting the paper mode had intermediate proportions of surveys with more than 5 non-demographic responses missing.

Mode preference and effect size for non-demographic questions across subgroups

For all years, all respondents and 58 question means, there were no questions with effect size (Web-based versus paper modes) ≥ 0.2 . There were 4, 7, and 15 questions with effect size ≥ 0.2 (Web-based versus IVR modes) in 2004, 2006, and 2008, respectively. Only one question with effect size ≥ 0.2 (Web-based versus IVR modes) in each of 2006 and 2008 had means that were statistically significantly different.

Statistically significant effect sizes ≥ 0.2 were more common among the demographic subgroups studied (males, females, <20 year olds, >60 year olds, whites, blacks, <6 month tenure, >20 years tenure, supervisors, and non-supervisors) than in the overall VHA population. Among the demographic subgroups, there were more statistically significant effect sizes ≥ 0.2 for the Web vs. IVR contrast compared to the Web vs. paper contrast.

Discussion

This paper sought to determine if respondents selecting each of the modes differed in demographic characteristics, in how many questions were answered, and in the answers they gave. We also wanted to know how any differences changed over time.

Over the 6 year period reported here, respondents to the VA's AES were increasingly likely to select the Web-based mode when given the option of using Web-based, IVR and paper modes. Possible reasons for this trend include increasing familiarity with the Internet and computers among the general population, the relative ease of taking a survey electronically, and efforts by the VA to increase access to computers for employees who do not regularly use them in their jobs. Regardless of the reasons for this trend, if it continues, the VA might be able to consider eliminating the paper and/or IVR modes because the loss of information from the reduced number of completed questionnaires would be small in relation to the costs of offering these modes.

The mode preferences among the subgroups within the major demographic categories were similar for each year with few exceptions. The <20 year old age group was much more likely to select the IVR mode than the other age groups. Wage grade employees were more likely to select the IVR and telephone modes than were the other occupation groups. One possible explanation for these preferences could be that both groups might have more limited access to a computer. The higher preference of multiracial respondents for the IVR compared to other racial groups is difficult to explain, especially since it consistently occurs in all years. If only the Web-based mode were used for AES, it is possible that at least some of the information for the <20 year old, wage grade, and multiracial employees would not have been captured. Of course, it is not possible to determine how many employees choosing the IVR and paper modes would have used the Web-based mode if it were the only one available.

The number of missing demographic questions out of a total of 7 was similar among modes in 2004. In 2006 and again in 2008, the proportion of surveys with 6 or more demographic questions missing increased dramatically for respondents selecting the paper mode. Because demographic questions are placed at the end of the questionnaire, a possible explanation for the increase in demographic questions missing for the paper mode is respondent fatigue. However, the proportion of paper surveys with more than 5 non-demographic questions missing increased only slightly from 2004 to 2008, and this proportion was less than that for the IVR mode. It is unlikely that respondent fatigue would affect only the demographic questions and not the non-demographic questions, and only for the IVR mode. Another possible explanation is that as the number of respondents selecting the paper mode decreases, the employees still using it are somehow less likely to answer demographic questions. These employees become a larger relative proportion of the paper responses and thus so does the number of questionnaires with ≥ 6 missing demographic questions. Again, if this occurred, a similar effect should be seen among the IVR surveys, but it is not.

Based on effect size, respondents selecting the paper mode were more similar to respondents selecting the Web-based mode than those selecting the IVR mode were to those selecting the Web-based mode. This finding held for the total

population and also for most of the demographic subgroups. These results suggest that, regardless of differences in question completion rates, paper surveys did not add much additional information on the surveyed population beyond what was captured by the Web-based surveys. On the other hand, the overall survey means would have been different had the information from the IVR surveys not been included.

Limitations

Although the VA tries to make all 3 modes available equally to all employees, we have no way to assess how much convenience influenced choices of survey mode. Differences among modes with regard to missing responses and question means could be due to something inherent in the mode itself, to the person selecting the mode (all things being equal), or to the relative ease with which each mode can be accessed by particular respondent groups.

Since demographic answers are self-disclosed, it is not possible to independently determine the likely accuracy of the responses.

We are not able to assess if respondents would switch to a different mode or would not participate if a particular mode was not offered as an option.

Conclusions

The AES is very important to the VA's efforts to improve its efficiency and effectiveness while maintaining customer and employee satisfaction. In order to accommodate employee preferences and thereby maximize response rates, the AES is offered in 3 modes. Although employees are increasingly likely to select the Web-based mode, in 2008 approximately 7.5% of employees were still using the IVR and paper modes. There were few differences in mode preference among demographic groups and subgroups. There were also few statistically significant differences in question response means among these groups when Web-based is compared to paper mode. There were more such differences between Web-based and IVR modes. It is unlikely that elimination of the paper mode would lead to significant changes in the demographics of the respondents or to the answers they provide. An increase in missing demographic questions could be expected. If the IVR mode were to be eliminated, there would be little change in the demographic characteristics of the respondent and the proportion of demographic questions missing, but response means could be expected to be different. If the trend toward Web-based mode continues, any overall changes to demographic patterns, missing rates, or response means due to elimination of the IVR or paper modes can be expected to diminish.

REFERENCES

- Cohen, J. 1988. *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. Erlbaum, Hillsdale, NJ.
- Rogelberg, S.G., and J.M. Stanton. 2007. "Introduction: Understanding and Dealing with Organizational Survey Nonresponse." *Organizational Research Methods* 10 (2): 195–209.
- Stocke, V. 2006. "Attitudes towards Surveys, Attitude Accessibility and the Effect on Respondents' Susceptibility to Nonresponse." *Quality and Quantity* 40: 259–88.
- The American Association for Public Opinion Research. 2008. *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys*. 5th ed. Lenexa, Kansas: AAPOR.
- Young, G.J. 2000. "Managing Organizational Transformations: Lessons from the Veterans Healthcare Administration." *California Management Review* 43: 66–82.