Moving the Behavioral Risk Factor Surveillance System from RDD to Multimode: A Web/Mail/Telephone Experiment

Michael W. Link and Ali Mokdad, Centers for Disease Control and Prevention, 4770 Buford Highway, NE, Mailstop K-66, Atlanta, GA, 30341-3717, Mlink@cdc.gov

Acknowledgements: We thank the four state coordinators Colleen Baker (New York), Larry Shireley (North Dakota), Linda Stemnock (Indiana), and Neha Thakkar (Arizona), as well as Ruth Jiles (Centers for Disease Control and Prevention), Janice Rush and Kerri Holloway (Clearwater Research), and Jodie Weiner and David Roe (RTI International) for assisting in developing and implementing this study.

The use of telephone-based random-digit dial (RDD) methods in public health surveys and surveillance is at a crossroads because of declining participation rates, increasing levels of effort and associated costs, and growing concerns over the quality of data collected. These concerns have caused researchers to consider adopting mixed-mode approaches of data collection rather than using a single mode. Combining two or more modes may improve response rates by providing respondents more time and flexiblity for completing a survey. Combining modes may also decrease costs in cases where alternative modes are less expensive to field than the standard mode and ensure better quality data by reducing potential nonresponse bias (1,2). However, modes of data collection differ along a number of dimensions, including the type and degree of interviewer interaction with the respondent; questionnaire wording, formatting, and presentation; the level of privacy and confidentiality afforded a respondent; and, the degree to which technology is used in the data collection process (1-3). Thus, different modes can, at times, produce different responses even when identical questions are asked of the same persons (4-9).

To date, several investigators have examined various aspects of multimode surveys that have combined telephone, mail, and face-to-face surveys, but our understanding of Web surveys is still quite limited (1,2, 10). Web surveys are both self-administered and computer-assisted. They can be completed at home (or wherever an individual has access to the Web) at the respondent's own time and pace. As such, we might expect them to offer respondents the same level of comfort and privacy as other computer-assisted self-interviewing (CASI) methods.

Using of mixed-mode approaches in epidemiological research is not new. But widespread consideration of such approaches for public health surveys and surveillance is a more recent phenomena. A number of investigators have directly compared the results from different modes that used the same questions and sample populations (3, 11-16). However, few investigators have actually focused on the results obtained when different modes are combined. Hochstim (17), who conducted one of the earliest such studies, looked at reports of health and medical conditions using mail, telephone, or in-person contact as the initial mode and followed-up with nonrespondents using the remaining two modes. Similar studies have looked at the results of mail surveys with telephone and in-person follow-up and telephone surveys with mail and in-person follow-up (18-20). In each case, the investigators showed that mixed-mode approaches improved response rates and produced higher quality data. Looking mixed-mode approaches from a somewhat different perspective, Brambilla and McKinley (21) compared responses obtained from an initial mail survey and those from a telephone follow-up of mail nonrespondents. They found that the two groups differed in their demographic characteristics and in their responses to questions about health status and health care utilization.

The current study builds upon these previous works in the following ways. First, we collected data using three modes (telephone, mail, and Web) to provide one of the first comparisons of Web survey methodology with other more traditional methods used in public health surveys and surveillance. Second, we targeted a broader population by surveying adults aged 18 years and older in four U.S. states. Third, we compared respondents who initially responded to one of the self-administered modes (Web or mail) and those who were interviewed as part of the telephone survey follow-up of nonrespondents. Finally, we compared responses to the Web and mail mixed-mode approaches to those obtained from a large ongoing health surveillance that uses only computer-assisted telephone interviewing (CATI).

MATERIALS AND METHODS

As one of the largest RDD telephone health surveys, the Behavioral Risk Factor Surveillance System (BRFSS) has been exploring the use of mixed-mode approaches to address declining response rates and the associated questions of data quality. Administered by the U.S. state health departments with support from the Centers for Disease Control and Prevention

(CDC), the BRFSS is designed to collect uniform, state-specific data on preventive health practices and risk behaviors that are linked to chronic diseases, injuries, and preventable infectious diseases iamong adults. It is conducted monthly in all 50 states, the District of Columbia, Puerto Rico, Guam, and the Virgin Islands. Details on BRFSS design and methodology are available elsewhere (22) and all BRFSS questionnaires and data are available at http://www.cdc.gov/brfss.

Fieldwork

We conducted mixed-mode experiments in four BRFSS states -- Arkansas, Indiana, New York, and North Dakota -- in October and November 2003. Respondents were randomly assigned to receive an invitation by mail on the first of the month to participate in either a Web survey or a mail survey. Nonrespondents to these two self-administered modes received CATI follow-up beginning on the 10th of the month. These experiments were conducted in parallel with the regular monthly BRFSS data collection, which is CATI-only. Thus, we obtained a relative baseline for comparison.

We drew separate state-specific monthly samples for the Web and mail experiments by following CDC approved and monitored RDD sampling protocols for BRFSS. These telephone numbers were cross-referenced with a database of known addresses. We retained only those households with telephone numbers that could be matched with a valid mailing address in the samples. In the mail experiment, all nonrespondents were followed up using CATI. In the Web survey, a subsampling strategy was used for nonrespondents for CATI follow-up. The initial Web sample was much larger than that of the mail survey to allow for the fact that not all households have internet access. Subsampling of nonrespondents helped to minimize the cost of the CATI follow-up for these participants. When appropriate, we used weighting adjustments to account for subsampling.

We used only the BRFSS core questionnaire in the Web and mail surveys. The BRFSS core consists of a set of questions asked by all states without modification in order or wording. The Web and mail versions of the BRFSS were developed with questions worded identically to that of the CATI version. Greater detail on the methodology used in this study is provided elsewhere (23). Data collection procedures were approved by Research Triangle Institute's Institutional Review Board.

Dependent variables

We examined the effects of survey mode on both response rates and responses obtained for several important health and risk indicators. Response rates were calculated by using the American Association for Public Opinion Research (AAPOR) response rate formula #4 (24). The numerator was the sum of all complete interviews and the partially completed interviews in which at least 50 percent of the core questionnaire items were answered. The denominator was the sum of known eligible subjects and the number of subjects with unknown eligibility that represented a proportion equal to the proportion of subjects of known eligibility that were eligible.

To assess potential data bias due to survey mode, we compared responses across modes for four dichotomous measures of chronic health conditions (asthma, diabetes, high blood pressure, and obesity) and four dichotomous measures of risk behavior (current smoking, binge drinking, talking with a doctor about sexually transmitted disease [STD] prevention, and HIV testing). Studies have shown that the mode of data collection can influence the responses obtained, particularly for the reporting of sensitive topics or stigmatized behaviors (4, 9). This set of questions provided a range of relative sensitivity. For example, we perceived questions about asthma, diabetes, and high blood pressure as minimally sensitive; questions about weight, smoking, and alcohol consumption as moderately sensitive; and, questions related to STDs and HIVas highly sensitive.

Asthma, diabetes, and high blood pressure were assessed by asking respondents: "Have you ever been told by a doctor, nurse, or other health professional that you have [condition]?" Obesity was determined by calculating the respondent's body mass index (BMI), based on self-reported height and weight. Respondents were classified as "obese" if the BMI was greater than or equal to 30 kg/m^2. Respondents who said that they currently smoke everyday or some days were classified as "current smokers." Binge drinking behavior was determined by asking: "Considering all types of alcoholic beverages, how many times during the past 30 days did you have 5 or more drinks on an occasion?" The final 2 variables were based on the questions: "In the past 12 months has a doctor, nurse, or other health professional talked to you about preventing sexually transmitted diseases through condom use?" and "Have you ever been tested for HIV?"

Statistical methods

The analysis was conducted in three parts. First, we compared the response rates obtained in the mixed-mode surveys to those of the CATI-only

baseline. Next, we looked at mode differences within the two mixed-mode groups by comparing responses to the self-administered modes (Web or mail) with those obtained in the respective CATI follow-ups of nonrespondents. We developed logistic regression models for each of the health and risk indicators to examine how the initial and nonresponse modes may have affected responses. We also adjusted for the impact of the key demographic variables. Odds ratios with 95 percent confidence intervals (CI) were estimated for each model. Second, we compared responses across three groups: (1) Web with CATI follow-up, (2) mail with CATI follow-up, and (3) CATI-only (baseline with address-matched cases only). Again, we used logistic models to examine differences in the eight health and risk indicators among respondents in these three groups.

RESULTS

We obtained complete responses from 2,101 respondents in the CATI-only baseline survey; 1,156 respondents in the mail survey with CATI follow-up (834 mail survey and 322 CATI follow-up completes); and, 1,785 respondents in the Web with CATI follow-up (1,150 Web survey and 635 CATI follow-up completes).

Response Rates

One of the central concerns for public health researchers is whether the use of alternative modes (Web or mail) in conjunction with telephone (CATI) follow-up of nonrespondents can produce higher response rates than those obtained by using CATI only. When we considered only the address-matched sample, we found that the response rates for the CATI-only baseline ranged from 31.3 percent (New York) to 49.5 percent (North Dakota); the average rate was 40.1 percent across the four states. The rates obtained in both of the mixed mode approaches were significantly higher. The mail and telephone mixed-mode design produced a mean response rate of 59.0 percent ($p < .001$ when compared with baseline) across the four states. The response rate to the mail survey was 43.6 percent. This percentage exceeded the rate achieved in the CATI baseline. An additional 16.4 percent response was obtained with the CATI follow-up. The Web and telephone design also performed well, with a 47.9 percent response rate ($p < .001$ compared to baseline). In contrast to the mail survey, however, the Web survey alone achieved only a 15.4 percent response rate. The remaining 32.5 percent was obtained through CATI follow-up of Web nonrespondents.

Initial versus follow-up modes

Do the responses obtained from the initial self-administered modes (Web or mail) differ from those obtained in the CATI follow-up of nonrespondents? We used logistic regression models to examine the health conditions and risk factors; we adjusted for respondents' state of residence, sex, race, age, education, household income, and number of adults in the household. For those in the mail and CATI follow-up group, we noted that mode affected the odds of obtaining a positive response for only one of the eight items examined (table 1). Among those completing the mail survey, we found that the odds of having a respondent indicate they had ever been tested for HIV decreased by 34 percent compared to those interviewed in the CATI follow-up. No significant differences were noted in the responses across these modes for the other seven health and risk indicators.

In contrast, we noted significant mode effects among the respondents in the Web and CATI follow-up group for three of the four indicators (table 2). Among the Web survey respondents, the odds of obtaining a positive response for diabetes decreased by 26 percent. For respondents in this same group, the odds of having talked to a doctor about STD prevention decreased by 40 percent. In contrast, the odds of obtaining responses indicative of binge drinking increased dramatically for the Web mode by more than 100 percent.

Mixed-mode groups versus CATI-only baseline

Next, we examined how the estimates compared when the responses to the self-administered modes were combined with their respective CATI follow-up data. Comparisons were made to the regular CATI-only surveillance data. After adjusting for differences across these three groups in terms of respondent and household characteristics, we noted only one significant difference between the mail mixed-mode respondents and those interviewed in the CATI-only baseline (table 3). For respondents in the mail mixed-mode approach, the odds of obtaining height and weight responses indicative of obesity increased by 30 percent.

In contrast, when we compared the data from the baseline, the Web and CATI follow-up led to significantly different estimates for five of the eight items. The odds of respondents indicating they had a particular health condition increased by 19 percent for high blood pressure, 23 percent for obesity, and 35 percent for diabetes. Conversely, for the risk behavior indicators, the odds of respondents saying they had been tested for HIV decreased by 14 percent among the Web mixed-mode respondents and by 35 percent for the STD prevention item.

DISCUSSION

Mixed-mode designs pairing mail or Web surveys with telephone follow-up of nonrespondents produced significantly higher response rates than did the use of CATI alone. For RDD-based public health surveys and surveillances, such as the BRFSS, this is encouraging news. Improvement in response rates should reduce the potential for nonresponse bias, provided that the differences between respondents and nonrespondents are not heightened in the process. Of the two mixed-mode designs tested, the mail-telephone combination proved the most effective for increasing survey participation. When used alone, the mail survey outperformed the Web survey by a nearly three-to-one response rate. Moreover, response to the mail survey alone was even higher than for the CATI-only approach. This finding is similar to others who have compared response rates for mail and telephone-based health surveys (13, 14).

The Web mixed-mode approach required a considerable level of CATI follow-up to produce the improved response rates. In part, the differences in the mail and Web rates can be traced to the levels of internet use among adults in the United States, which averages 70percent across different age groups. For the population in our study, there are much higher rates of coverage for mail (95 percent) and telephone (96 percent) than for the Web (25). Other factors may also have come into play. Respondents may have had access to the internet, but they may not have used the Web regularly or had only rudimentary computer skills, which may have decreased their willingness to complete an online survey. The respondents who received the single-page Web survey letter may also have been more likely to discard or misplace the letter than did those who received the larger packet of materials for the mail survey. Finally, the general public may simply be more wary of reporting health information over the Internet than sending responses in a sealed envelop.

Although the multi-mode approach to data collection can improve survey participation, we found that the approach has the potential for introducing measurement-related biases if the different modes produce significant variation in the estimates obtained. For example, for both mixed-mode designs, we showed at least some evidence of possible mode effects, but we observed significant variation across a greater number of items collected with the Web mixed-mode design. Moreover, the direction of the differences between the Web mixed-mode design and the baseline were not always in the direction we expected. Although the mixed-mode approach produced higher prevalence rates for diabetes, high blood pressure, and obesity, we found that the approach produced lower rates for STD prevention and HIV testing. Using findings from previous research (4, 8, 9), we expected the Web, which is a self-administered, computer-assisted mode, to increase reporting over that of the CATI baseline for more sensitive behaviors, such as talking about STD prevention and HIV testing. Because the mail mixed-mode approach, which had the highest response rate of the three approaches tested, seems to corroborate the CATI-only results, we believe that the results from the Web mixed-mode design may reflect over-representation and under-representation of those with these behaviors.

The findings of this study need to be evaluated within the context of its limitations. First, because the Web and mail respondents were notified about the study by mail rather than by telephone we included only those sample members with a valid address that could be matched to the randomly drawn telephone number. Thus, a sampling bias may have been introduced because persons who have addresses that match to their telephone number are more likely to be white and of higher socioeconomic status than are those with telephone numbers that cannot be matched to an address (26). Our results may have varied if we had contacted by telephone those persons who we could not match to an address to obtain mailing information and included them in the study. Second, we used the BRFSS RDD sampling frame as a starting-point for both the Web and mail mixed-mode designs. Using the sampling frame from on-going surveillance allowed us to make more valid comparisons with those baseline data. However, we may have limited the utility of the mail and Web approaches. The mail and Web survey approaches may have been more effective if we had used alternative sampling frames, such as mailing lists or directories for mail and internet panels for Web or dual sampling frame designs (combinations of alternative frames with the BRFSS RDD frame). Finally, the study was conducted in four states, which may not be representative of the general U.S. population.

In summary, when compared to the relative standard set by the on-going CATI-only approach, mixed-mode designs appear to produce higher response rates. Combining modes, however, may also introduce unintended biases into the data as survey mode does appear to affect the responses obtained to certain questions. Overall, the combination of mail survey with telephone follow-up of nonrespondents appears to provide a better alternative than using a similar design that combines Web and telephone surveys. We obtained higher response rates with the mail mixed-mode approach, which decreased the level of nonresponse, and, in general, obtained results

obtained which were statistically identical to those from the baseline CATI survey. In contrast, the Web survey alone had a very low response rate and required considerable CATI follow-up to obtain slightly higher response rates than did the CATI-only approach. The responses from this mixed-mode approach, however, were sufficiently different from those of the baseline. Thus, using such an approach should be used with caution, if at all. Web surveys are still in their infancy and may yet play a major role in health surveys and surveillance, either within particular niches (such as surveys of particular populations where internet use is high) or with the general public at some future date (12,27). As this study highlights, we believe that any mixed-mode approach should be tested for possible influences on responses and, wherever possible, compared with an existing standard to assess the true utility of such approaches.

REFERENCES

1 Dillman DA. Mail and Internet Surveys: The Tailored Design Method. New York, NY: John Wiley & Sons, 2000.

2 Groves RM, Fowler FJ, Couper MP, et al. Survey Methodology. Hoboken, NJ: John Wiley & Sons, 2004.

3 Groves R, Kahn R. Surveys by Telephone: A National Comparison with Personal Interviews. New York: Academic Press, 1979.

4 Turner CF, Ku L, Rogers SM, et al. Adolescent sexual behavior, drug use, and violence: increased reporting with computer survey technology. Science 1998;280:867-73.

5 De Leeuw ED. Data Quality in Mail, Telephone, and Face-to-Face Surveys. Amsterdam: TT Publications, 1992.

6 Aquilino WS. Interview mode effects in surveys of drug and alcohol use: a field experiment. Public Opin Q, 1994;58:210-40.

7 DeMaio TJ. Social desirability and survey measurement: a review. In: Turner CF, Martin E, eds. Surveying Subjective Phenomena, volume 2. New York, NY: Russell Sage, 1984: 257-82.

8 O'Reilly JM, Hubbard ML, Lessler JT, et al. Audio and video computer assisted self interviewing: preliminary tests of new technologies for data collection. J Off Stat, 1994;10: 197-214.

9 Tourangeau, R, Smith T. Asking sensitive questions: the impact of data collection, question format, and question context. Public Opin Q, 1996;60,275-304.

10 Couper MP. Web surveys: a review of issues and approaches. Public Opin Q, 2000;64:464-94.

11 Brøgger J, Bakke P, Eide G, et al. Comparison of telephone and postal survey modes of respiratory symptoms and risk factors. Am J Epidemiol, 2002;155:572-76.

12 McCabe S, Boyd C, Couper M, et al. Mode effects for collecting alcohol and other drug use data: Web and US mail. J Studies Alcohol, 2002;63:755-61.

13 Van Campen C, Sixma H, Kerssens J, and Peters L. Comparisons of the costs and quality of patient data collection by mail versus telephone versus in-person interviews. European J Pub Health, 1998; 8: 66-70.

14 McHorney C, Kosinski M, Ware J. Comparison of the costs and quality of norms for the SF-36 health survey collected by mail versus telephone interview: results from a national study. Med Care, 1994;32:551-67.

15 O'Toole B, Battistutta D, Long A, et al. A comparison of costs and data quality of three health survey methods: mail, telephone, and personal home interview. Am J Epidemiol, 1986;124:317-328.

16 Wright S, Aquilino WS, and Supple AT. A comparison of computer-assisted and paper-and pencil self-administered questionnaires in a survey on smoking, alcohol, and other drug use. Publ Opinion Q, 1998;62:331-53.

17 Hochstim JR. A critical comparison of three strategies of collecting data from households. J Am Stat Assoc, 1967;62:976-89.

18 Siemiatycki J. A comparison of mail, telephone, and home interview strategies for household health surveys. Am J Public Health, 1969;69:238-45.

19 Siemiatycki J, Campbell S. Nonresponse bias and early versus all responders in mail and telephone surveys. Am J. Epidemiol, 1984;120:291-301.

20 Siemiatycki J, Campbell S, Richardson L, et al. Quality of response in different population groups in mail and telephone surveys. Am J. Epidemiol, 1984;120,302-14.

21 Brambilla DJ, McKinlay SM. A comparison of responses to mailed questionnaires and telephone interviews in a mixed mode health survey. Am J Epidemiol, 1987; 126: 962-71.

22 Mokdad AH, Stroup D, Giles W. Public health surveillance for behavioral risk factors in a changing environment: recommendations from the behavioral risk factor surveillance team." MMWR Morbidity and Mortality Weekly Report, 2003;52 (No. RR-9):1-12

23 Link, M.W., Mokdad. A.H. Are Web and mail feasible options for the Behavioral Risk Factor Surveillance System? In Cohen, S.B. and Lepkowski, J.M., eds., Eighth Conference on Health Survey Research Methods. Hyattsville, MD: National Center for Health Statistics, 2004, pp.149-158.

24 American Association for Public Opinion Research. Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys. Ann Arbor, MI: AAPOR, 2004.

25 Nielsen/NetRatings. Three out of four Americans have access to the internet. Press release, March 18, 2004. Available at: http://www.nielsen.netratings.com/pr/pr_040318.pdf

26 Link MW, Mokdad AH, Town M, et al. Improving response rates for the BRFSS: use of lead letters and answering machine messages**.** *Proceedings of the American Statistical Association, Survey Methodology Section* (CD ROM), Alexandria, VA: American Statistical Association, 2004.

27 Raine H. The changing online population: it's more and more like the general population. Pew Internet and American Life Project report, 2001. Available at: http://www.pewinternet.org/reports/index.asp

TABLE 1. Comparison of mail survey and CATI follow-up self-reports of health conditions and risk factors

	Mail survey % reporting condition / behavior[1]	CATI follow-up % reporting condition / behavior[2]	Mail survey AOR	95% CI[3]
Asthma	11.9	12.4	1.01	0.67, 1.52
Diabetes	11.8	8.7	1.37	0.86, 2.18
High blood pressure	38.2	30.6	1.28	0.94, 1.75
Obese (BMI > 30)	26.3	25.2	1.16	0.84, 1.59
Current smoker	16.9	20.2	1.03	0.71, 1.47
Binge drinking	12.2	13.8	1.13	0.74, 1.73
STD prevention	4.4	6.8	0.81	0.37, 1.74
Tested for HIV	31.1	43.2	0.66*	0.46, 0.94

[1] Unadjusted prevalence estimates with standard errors ranging from 1.8% to 4.1%.
[2] Unadjusted prevalence estimates with standard errors ranging from 3.4% to 7.0%.
[3] Models are adjusted for state of residence, sex, race, age, education, household income, and number of adults in the household. CATI follow-up is referent with AOR of 1.0 for each model.
Significance: * p <= .05 ** p <= .01 *** p <= .001

TABLE 2. Comparison of Web survey and CATI follow-up self-reports of health conditions and risk factors

	Web Survey % reporting condition / behavior[1]	CATI follow-up % reporting condition / behavior[2]	Web survey AOR	95% CI[3]
Asthma	12.1	10.7	1.18	0.93, 1.49
Diabetes	10.3	13.9	0.74*	0.58, 0.94
High blood pressure	32.9	36.0	1.11	0.94, 1.32
Obese (BMI > 30)	25.6	24.1	1.12	0.94, 1.34
Current smoker	17.6	21.6	0.84	0.69, 1.02
Binge drinking	21.8	12.6	2.12***	1.69, 2.66
STD prevention	3.4	6.1	0.60*	0.38, .095
Tested for HIV	32.8	35.3	0.93	0.77, 1.12

Note: data are weighted to account for subsampling of CATI follow-up respondents.
[1] Unadjusted prevalence estimates with standard errors ranging from 1.4% to 3.2%.
[2] Unadjusted prevalence estimates with standard errors ranging from 2.1% to 4.3%.
[3] Models are adjusted for state of residence, sex, race, age, education, household income, and number of adults in the household. CATI follow-up is referent with AOR of 1.0 for each model.
Significance: * p <= .05 ** p <= .01 *** p <= .001

TABLE 3. Comparison of CATI-only and mixed-mode surveys in self-reports of health conditions and risk factors

	CATI-only % reporting condition / behavior[1]	Mail with CATI follow-up % reporting condition / behavior[2]	Web with CATI follow-up % reporting condition / behavior[3]	Mail with CATI follow-up AOR[4]	95% CI	Web with CATI follow-up AOR[4]	95% CI
Asthma	11.6	12.2	11.2	1.03	0.82, 1.29	0.95	0.80, 1.13
Diabetes	9.5	11.0	12.8	1.03	0.81, 1.31	1.35***	1.13, 1.62
High blood pressure	31.1	36.1	35.0	1.13	0.95, 1.33	1.19**	1.05, 1.35
Obese (BMI > 30)	21.5	25.9	24.6	1.30**	1.09, 1.54	1.23**	1.08, 1.41
Current smoker	22.7	17.8	20.3	0.83	0.69, 1.00	0.94	0.82, 1.08
Binge drinking	14.8	12.7	15.2	1.09	0.86, 1.37	1.13	0.96, 1.33
STD prevention	7.9	5.2	5.1	0.72	0.48, 1.07	0.65**	0.49, 0.86
Tested for HIV	37.4	34.6	34.3	0.92	0.76, 1.12	0.86*	0.75, 0.99

Note: data are weighted to account for subsampling of Web survey CATI follow-up respondents.
[1] Unadjusted prevalence estimates with standard errors ranging from 1.3% to 2.5%.
[2] Unadjusted prevalence estimates with standard errors ranging from 1.5% to 3.3%.
[3] Unadjusted prevalence estimates with standard errors ranging from 1.3% to 2.8%.
[4] Models are adjusted for state of residence, sex, race, age, education, household income, and number of adults in the household. CATI-only is referent with AOR of 1.0 for each model.

Significance: * p <= .05 ** p <= .01 *** p <= .001