

# TECHNICAL PAPERS ON HEALTH AND BEHAVIOR MEASUREMENT

## TECHNICAL PAPER 46

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## Randomized Controlled Trial of Audio Computer-assisted Self-Interviewing: Utility and Acceptability in Longitudinal Studies

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Recent studies have reported on the utility of audio computer-assisted self-interviewing (ACASI) in surveys of human immunodeficiency virus (HIV) risk behaviors that involve a single assessment. This paper reports the results of a test of ACASI within a longitudinal study of HIV risk behavior and infection. Study participants (gay men ( $n = 1,974$ ) and injection drug users ( $n = 903$ )) were randomly assigned to either ACASI or interviewer-administered assessment at their second follow-up visit 12 months after baseline. Significantly more of the sexually active gay men assessed via ACASI reported having sexual partners who were HIV antibody positive (odds ratio = 1.36, 95% confidence interval: 1.08, 1.72), and a higher proportion reported unprotected receptive anal intercourse. Among injection drug users (IDUs), our hypothesis was partially supported. Significantly more IDUs assessed via ACASI reported using a needle after another person without cleaning it (odds ratio = 2.40, 95% confidence interval: 1.34, 4.30). ACASI-assessed IDUs reported similar rates of needle sharing and needle exchange use but a lower frequency of injection. Participants reported few problems using ACASI, and it was well accepted among members of both risk groups. Sixty percent of the participants felt that the ACASI elicited more honest responses than did interviewer-administered questionnaires. Together, these data are consistent with prior research findings and suggest that ACASI can enhance the quality of behavioral assessment and provide an acceptable method for collecting self-reports of HIV risk behavior in longitudinal studies and clinical trials of prevention interventions. *Am J Epidemiol* 2000;152:99–106.

assessment, risk; HIV; homosexuality, male; questionnaires; sex behavior; substance abuse, intravenous

Epidemiologic studies of human immunodeficiency virus (HIV) infection and clinical trials of HIV prevention interventions require reliable, valid, and efficient methods of assessing behaviors that may result in viral exposure. Since the primary objective of these studies is to evaluate factors associated with seroincidence, accurate measurement of behaviors that could lead to infection is essential. In the

study of biomedical interventions such as vaccines and microbicides, this issue is particularly important since tests of these products must, for ethical reasons, be coupled with behavioral interventions designed to reduce risk of infection. There is substantial concern that risk behaviors may be altered during these studies and, specifically, that participants in these trials may increase risky behavior based upon an assumption of efficacy (1–3). In studies such as HIV vaccine trials, where there is the potential for participants to “unblind” themselves, these behavioral changes may not be equally distributed across experimental and control conditions. Additionally, many efficacy studies of behavioral interventions rely heavily, if not entirely, on behavioral outcomes. Thus, accurate estimates of the type, frequency, and duration of risk behaviors are necessary in order to understand HIV transmission and the efficacy of preventive interventions (4).

There are a number of challenges to the accurate assessment of HIV risk behaviors within the epidemiologic and prevention trial framework. Of particular concern is the potential for study participants to underreport episodes of viral exposure. This may occur as a result of embarrassment, privacy concerns, or fear of negative reactions, since sensitive behaviors must be assessed by research staff who are concurrently promoting risk reduction, either directly or indirectly (5–8). Error may also result from the inability of

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Abbreviations: ACASI, audio computer-assisted self-interviewing; HIV, human immunodeficiency virus; IAQ, interviewer-assisted questionnaire; IDUs, injection drug users; VPS, Vaccine Preparedness Study.

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study participants to recall potential exposures that occurred during the assessment interval, which is often 6 months or longer (9). These reporting problems may be compounded by variations in the administration of interviews since prevention trials typically use multiple interviewers, often at multiple sites, with repeat assessments.

There is growing evidence that the measurement of behaviors, particularly those that are considered sensitive or socially undesirable, can be performed more effectively through the use of computer-assisted self-interview (10). Computer-assisted interviews without audio have been shown to be reliable and valid in both survey and clinical settings (11–13). They have demonstrated acceptability among respondents, and there is substantial evidence that computer-assisted assessments may enhance accuracy in reporting sensitive information. (14–16). The computer-assisted self-interview technology has been adapted to include sound (audio computer-assisted self-interviewing questionnaire (ACASI)). Using ACASI, the research subject listens to a recorded human voice and responds to the question via keyboard entry (or the use of another input device such as a “touch screen” or “mouse”). The addition of audio expands the utility of this method of interview administration by eliminating the requirement for respondent literacy. Equally important, the ACASI removes interviewer-introduced bias, standardizes question administration, and eliminates skip pattern errors. ACASI has been used in survey research and has been shown to enhance the reporting of behaviors that are often uncomfortable for individuals to disclose to others. For example, in a national survey of adolescent males, respondents who completed the questionnaire using ACASI reported engaging in risk behaviors (e.g., male-to-male sex, injection drug use, and sexual contact with drug injectors) at more than three times the rate of respondents who completed self-administered questionnaires (17). Similar finding were reported when ACASI was tested in a survey of injection drug users (IDUs) visiting four syringe exchange programs (18).

Given the importance of valid and reliable measurement of behaviors in studies of HIV infection, ACASI technology offers a potential to improve the quality of behavioral data and, consequently, our understanding of factors associated with HIV infection and the interventions that may prevent it. The Vaccine Preparedness Study (VPS) provided a unique opportunity to examine the equivalence of ACASI and interviewer-administered questionnaires (IAQ) within the framework of an ongoing longitudinal study of risk behaviors and HIV seroincidence (19, 20).

The primary objective of this evaluation of ACASI was to test the hypothesis that individuals interviewed by this method would report equal or higher rates of participation in HIV risk behaviors compared with controls assessed via IAQ. Equivalence was hypothesized because of the context in which the ACASI was being tested. Our assumption was that the sensitivity of responding to questions about sexual behavior and drug use would be minimal among these cohorts that had already confidentially reported practicing behaviors that placed them at risk of HIV infection. The evaluation of the ACASI was introduced at the 12-month

follow-up visit. Thus, study participants had been screened for HIV risk, found eligible, and enrolled, and they were previously interviewed two times by research staff who completed detailed assessments of HIV risk behavior. Equal and higher rates of reporting were pooled since these outcomes would support using this technology in future studies. Further, since a higher rate of reporting sensitive information is suggestive of increased accuracy, lower rates of reporting sensitive information would diminish the utility of this technology. Secondary objectives were focused on evaluating the feasibility of using ACASI in future studies and its acceptability among gay men and IDUs.

## MATERIALS AND METHODS

The VPS followed 3,257 gay men and 1,124 injection drug users. Enrollment took place in eight US cities between April and November 1995. To be eligible, gay men had to report anal intercourse during the previous year and drug users had to report injecting during the previous 6 months. Using a common protocol and uniform instruments, participants completed behavioral assessments, HIV testing, and risk reduction counseling at 6-month intervals during the 18-month study. Because this was a multisite study, it was also possible to examine the feasibility of using ACASI in a variety of settings and to test its acceptability among participants from two risk groups (gay men and IDUs) representing a broad range of sociodemographic characteristics.

Study participants were drawn from six of the VPS sites: two IDU sites (New York City, New York, and Philadelphia, Pennsylvania) and four gay men's sites (New York City, New York; Chicago, Illinois; Seattle, Washington; and San Francisco, California). A total of 600 gay men (150 from each site) and 500 IDUs (250 from each site) were randomly selected for ACASI assessment. All subjects from these sites who were not selected for ACASI assessment served as controls. These sample sizes provided 95 percent power to reject the null within each risk group.

The IAQ version of the month 12 VPS questionnaire was used as the model for programming the ACASI. This questionnaire included nine demographic items, eight health questions, 31 questions about sexual activity, seven alcohol and noninjection drug use questions, and seven questions about injection drug use. Since many of these items had multiple questions incorporated within them, the questionnaire included more than 258 individual items and a complex skip pattern. The questionnaire was designed for administration in about 30 minutes by trained interviewers.

The ACASI version incorporated identical question sequence and skip patterns using a wording as similar as possible to those found in the IAQ version. Several items that required text responses were dropped from the ACASI, and some optional probes were not included. For estimation of the frequency of specific sexual activities during the follow-up interval, the ACASI offered assistance to participants who desired help in calculating the frequency. This help was modeled after the manner in which interviewers had been trained to provide such assistance by calculating a total frequency based upon estimates of frequency during a

shorter time interval (e.g., per week) and then examining the total and recalculating if warranted. The ACASI interviews were completed using desktop computers located in private areas of the study sites.

At the data collection visit, a standardized administration protocol was implemented. After confirmation of group assignment, this protocol required trained staff to provide participants with a brief orientation to the system and to complete the registration of the participant by entering the subject's study identification and date of administration. All participants then completed five practice questions with staff present. These practice questions were designed to provide examples of each type of response (continuous, categorical, dichotomous) contained in the interview. After successful completion of the practice questions, the participant was left alone to complete the assessment and was told to contact staff who remained easily accessible in case of questions or problems. Research staff were instructed to remain available but not to directly observe the respondent during the ACASI completion.

Data were saved on the hard drive of the computer as the respondent moved from one section of the questionnaire to another. At the end of the interview, the data were saved onto a diskette, and all data from the hard drive were copied onto tape backups at the close of each day in which data had been collected. Data from all sites were regularly transferred via modem to a central database.

At the close of the ACASI interview, subjects were asked to complete a two-page, self-administered acceptability questionnaire, which asked about problems they might have encountered in using the ACASI. The acceptability questionnaire also asked respondents to indicate which mode of questionnaire administration they would prefer for future assessments, which mode they felt best protected the privacy of their responses, and which mode would elicit the most honest responses.

To test the hypothesis of equivalence, responses from subjects assigned to the ACASI condition were compared with responses from controls who completed the questionnaire via interviewer administration. For this test, a limited set of risk-related items were selected prior to study implementation. These items assessed behaviors considered to be the most sensitive to response biases and socially desirable reporting. For the gay men, the following questions were selected: 1) any unprotected receptive anal intercourse; and 2) sexual activity with any HIV-positive partner. For the IDUs, the questions were 1) injecting at a rate equal to or greater than one time per week; 2) any sharing of syringes; 3) use of a syringe after another person without cleaning it; and 4) not using the needle exchange program. As stated, equivalence between the two modes of administration was defined as ACASI reports of equal or greater frequency. Thus, the null hypotheses for these analyses was that the ACASI would yield significantly lower rates of reporting on these items. The null specified a minimum tolerable odds ratio of 0.80 and thus would be rejected if the odds ratio for the collection of key variables was greater than 0.80. Secondary objectives of feasibility and acceptability were assessed by descriptive analyses of participant responses to the acceptability questionnaire.

## RESULTS

Owing to loss to follow-up, mortality, and study inactivation during the first 12 months of the study, 528 of the 600 randomly selected gay men and 418 of the 500 randomly selected IDUs were available for assignment to the ACASI condition. A total of 1,446 gay men and 485 IDUs completed the IAQ and served as controls. There were no significant demographic differences between the ACASI group and the control group within each risk group. No differences in risk behavior reported at the prior assessment point (6-month follow-up) were found (table 1). However, there were significant sociodemographic differences between risk groups. Compared with the gay male cohort, the IDUs were significantly older, more likely to be Black or Latino, and significantly less likely to have attended college. In addition, overall, approximately 27 percent of the IDUs were women.

Not all of the subjects assigned to the ACASI condition agreed to or were able to complete their assessment at the computer. The reasons for this included participant refusals ( $n = 23$ ), which occurred primarily at one site that required separate consent forms (all other sites secured institutional review board approval without requiring an additional consent form). In 45 instances, subjects were incorrectly assigned by staff to the IAQ condition. In nine cases, computers were not used due to technical problems, and 11 participants were incarcerated at the time of follow-up and received IAQ assessments in correctional facilities. (Consent forms for these 11 subjects were approved by institutional review boards that included prison advocates.)

### Testing equivalence

Responses to items selected to test the hypotheses of equivalence between ACASI and IAQ are presented in table 2 for the two risk groups. As can be seen, when compared with those interviewed via IAQ, significantly more of the sexually active gay men assigned to the ACASI condition ( $n = 510$ ) reported having engaged in sex with men who they knew were HIV positive. In addition, a higher, although nonsignificant, rate of unprotected receptive anal intercourse was reported by those assigned to the ACASI assessment.

Among the ACASI-assessed IDUs who reported injection drug use during the previous 6 months ( $n = 225$ ), significantly fewer of those assigned to the ACASI reported injecting at a rate of once a week or more. Those assigned to the ACASI assessment were 2.40 times more likely to report using a syringe after someone else without cleaning it. No differences in responses were found for the more broadly worded question, "With how many people have you shared a needle," which can refer to a number of behaviors, including passing a syringe to another after its use. No differences were found in reported frequency of needle exchange use.

Thus, the null, that responses to the ACASI would yield lower rates of reporting selected items, was rejected for the gay cohort. Given lower frequency of injection reported among the IDUs assessed by ACASI, the null could not be

**TABLE 1. Characteristics of study participants by risk group and experimental condition, Vaccine Preparedness Study, 1996**

	Gay men				IDU*			
	ACASI* (n = 528)		IAQ* (n = 1,446)		ACASI (n = 418)		IAQ (n = 485)	
	No.	%	No.	%	No.	%	No.	%
<b>Sociodemographics</b>								
Age (years)								
18-25	90	17	233	16	11	3	8	2
26-30	159	30	384	27	22	6	32	7
31-35	118	22	353	24	69	17	63	13
36-40	81	15	229	16	99	24	102	21
>40	80	15	247	17	217	52	280	58
Race								
White	403	76	1,086	75	163	39	176	36
Black	37	7	103	7	159	38	206	43
Latino	59	11	173	12	87	21	90	19
Other	29	5	84	6	9	2	13	3
Education								
Less than high school	7	1	22	2	143	34	190	39
High school/GED*	49	9	111	8	160	38	182	38
More than high school	472	89	1,313	91	115	28	113	23
Gender								
Male	528	100	1,448	100	293	70	366	75
Female					125	30	119	25
Risk behaviors								
Any needle sharing (among injectors)								
Yes		NA*		NA	77	27	96	28
No		NA		NA	212	73	249	72
HIV* + male partners								
Yes	127	25	347	25	NA		NA	
No	382	75	1,055	75	NA		NA	

\* IDU, injection drug use; ACASI, audio, computer-assisted self-interview; IAQ, interviewer-administered questionnaire; GED, graduate equivalency diploma; NA, not applicable; HIV, human immunodeficiency virus.

**TABLE 2. Equivalence of audio-assisted computer self-interviewing surveys and interviewer-administered questionnaires among sexually active gay men and active injection drug users, Vaccine Preparedness Study, 1996**

	ACASI* (% yes)	IAQ* (% yes)	OR*	95% CI*
Gay men†				
HIV* + partners	28.9	22.8	1.36	1.08, 1.72
Any unprotected, receptive anal intercourse	38.7	35.4	1.15	0.93, 1.42
IDU*,‡				
Injecting drugs more than once/week	56.0	67.6	0.74	0.51, 1.09
Any needle sharing	24.0	23.7	1.03	0.69, 1.55
Use needle exchange	68.9	70.5	0.90	0.62, 1.32
Used needle after another without cleaning	14.7	6.7	2.40	1.34, 4.30

\* ACASI, audio, computer-assisted self-interview; IAQ, interviewer-administered questionnaire; OR, odds ratio; CI, confidence interval; HIV, human immunodeficiency virus; IDU, injection drug use.

† ACASI, n = 510; IAQ, n = 1,393.

‡ ACASI, n = 225; IAQ, n = 312.

rejected for the IDU cohort. Additional analyses were conducted to explore more fully the detectable mode effects on a sample of both "sensitive" and "nonsensitive" items.

#### Mode effects among gay men

As shown in table 3, men assessed via ACASI (n = 528) reported less certainty about the HIV serostatus of their sexual partners. Significantly more men assessed via ACASI stated that they were unsure of the serostatus of their partner, and significantly fewer men assessed via ACASI reported having sex with men they were sure were HIV negative. Significantly more men assessed via ACASI reported being tested for HIV outside the study, and fewer men reported being willing to join a vaccine trial when a preventive vaccine becomes available.

When responses to other questionnaire items were examined, there were no differences between ACASI and IAQ. These included whether or not the participant currently had health insurance, whether or not he or she had been ill for 3

**TABLE 3. Responses by mode of questionnaire administration among gay men, Vaccine Preparedness Study, 1996**

	ACASI* (%) (n = 528)	IAQ* (%) (n = 1,446)	OR*	95% CI*
Health insurance	77.7	80	0.81	0.63, 1.04
Ill for 3 days or more	39.8	44	0.81	0.59, 1.09
Hospitalized	2.5	2.5	0.84	0.43, 1.62
HIV* test at another location	10.4	7.4	1.45	1.02, 2.06
Willing to join vaccine trial	61.1	66.5	0.81	0.66, 1.00
Sexual activity				
Any male partners	96.6	96.4	1.13	0.65, 1.97
Among sexually active men†				
Partner status				
% with HIV- partners	69.2	78.8	0.62	0.49, 0.78
% with HIV? partners	65.7	60.7	1.17	0.94, 1.53
Any unprotected receptive anal intercourse with				
HIV- partners	28.7	29.4	0.99	0.78, 1.24
HIV+ partners	3.2	2.5	1.19	0.65, 2.20
HIV? partners	10.5	7.7	1.30	0.91, 1.85

\* ACASI, audio, computer-assisted self-interview; IAQ, interviewer-administered questionnaire; OR, odds ratio; CI, confidence interval; HIV, human immunodeficiency virus.

† ACASI, *n* = 510; IAQ, *n* = 1,393.

or more days consecutively or had been hospitalized during the follow-up interval, and whether or not they had had any male sexual partners.

### Mode effects among IDUs

Similar to the mode effects observed among the gay men, most of the items we examined among IDUs (*n* = 418) yielded no differences among IDUs (table 4). These items included reports of illness or hospitalization, being tested for HIV outside the study, and willingness to enroll in an HIV vaccine trial. However, significantly fewer ACASI-assessed IDUs reported having health insurance, and significantly fewer reported any injection during the follow-up interval.

### Feasibility and acceptability

Table 5 summarizes data from the acceptability questionnaire regarding difficulties encountered in completing the ACASI interview. Of the 847 subjects who completed this form, the most frequently reported problem (*n* = 75) was the slow speed of the recorded voice. Thirty-six of the ACASI participants reported difficulty in correcting responses. Few participants reported not understanding the questions or having difficulty finding the appropriate response keys. Two ACASI-assessed individuals felt that the speed of the recorded voice was too fast.

As shown in tables 6 and 7, most respondents reported either no preference or a distinct preference for ACASI in response to questions of choice for future interviews and protection of privacy. Relatively small proportions of

**TABLE 4. Responses by mode of questionnaire administration among injection drug users, Vaccine Preparedness Study, 1996**

	ACASI* (%) (n = 418)	IAQ* (%) (n = 485)	OR*	95% CI*
Health insurance	60.4	79	0.40	0.30, 0.54
Ill for 3 days or more	30.5	33.3	0.87	0.53, 1.42
Hospitalized	23.2	21	1.11	0.81, 1.53
HIV* test at another location	15.6	16.3	0.97	0.68, 1.39
Willing to join vaccine trial	65.3	70	0.78	0.58, 1.03
Drug use†				
Injected any drug	53.8	64.3	0.69	0.52, 0.90
Among injectors‡				
Used shooting gallery	17.8	18.6	1.14	0.72, 1.81
Shared cookers, cotton, or rinse water	34.7	37.2	0.97	0.67, 1.39

\* ACASI, audio, computer-assisted self-interview; IAQ, interviewer-administered questionnaire; OR, odds ratio; CI, confidence interval; HIV, human immunodeficiency virus.

† ACASI, *n* = 418; IAQ, *n* = 485.

‡ ACASI, *n* = 225; IAQ, *n* = 312.

respondents had a distinct preference for IAQ in response to these questions. The endorsement of ACASI was most pronounced in responses to the question about during which mode of administration participants would be more honest. Both the IDUs (60.2 percent) and the gay men (58.7 percent) felt that the ACASI would yield more honest responses from participants.

### DISCUSSION

The findings of this study provide evidence of the utility of ACASI assessment within the context of epidemiologic research and clinical trials to evaluate preventive interventions for HIV. Not only was the reporting of the most sensitive information enhanced among those assigned to the computer assessment, but participants reported few problems in using this technology and endorsed this method of data collection as more likely to yield honest responses.

These data extend our understanding of the potential application of ACASI beyond its use in brief surveys in which respondents are assessed once. In surveys in which ACASI has been used, the absence of an interviewer has been shown to result in more frequent reports of participation in behaviors known to be socially unacceptable or undesirable (11, 12). In our study, all participants had been selected and originally enrolled because they reported having engaged in high-risk sexual and drug use behaviors. Within this context, we anticipated that disclosure of all but the most risky behaviors would be less problematic, and thus, differences between mode of administration were less pronounced. These data cannot evaluate the impact of repeated ACASI assessments. Subjects were assessed only once. Thus, the contribution of these data lies in their ability to address the power of ACASI to improve measurement even after relationships with the research staff have been well established.

**TABLE 5. Difficulties encountered in use of the audio, computer-assisted self-interview, Vaccine Preparedness Study, 1996**

	IDU* (n = 377)		MSM* (n = 470)		Total	
	No.	%	No.	%	No.	%
Any difficulties with ACASI*	37	9.8	133	28.3	170	20.1
Spoke too slowly	12	32.4	63	47.4	75	44.1
Difficulty making corrections	9	24.3	27	20.3	36	21.2
Did not understand questions	6	16.2	14	10.5	20	11.8
Difficulty finding keys	9	24.3	3	2.3	12	7.1
Spoke too quickly	1	2.7	1	0.8	2	1.2
Difficult sections	17	4.5	44	9.4	61	7.2
Living situation	2	11.8	3	6.8	5	8.2
Health	3	17.6	5	11.4	8	13.1
Sexual behaviors	8	47.1	33	7.0	41	67.2
Alcohol and drug use	10	58.8	9	20.5	19	31.1

\* IDU, injection drug use; MSM, men who have sex with men; ACASI, audio, computer-assisted self-interview.

**TABLE 6. Preference and perceptions of privacy and honesty regarding the use of the audio, computer-assisted self-interview among gay men, Vaccine Preparedness Study, 1996**

	ACASI*		IAQ*		No preference		Do not know	
	No.	%	No.	%	No.	%	No.	%
Preference for future interviews	174	37.0	91	19.4	197	41.9	4	0.9
Which protects privacy best?	109	23.2	24	5.1	283	60.2	50	10.6
With which will people be more honest?	276	58.7	31	6.6	116	24.7	44	9.4

\* ACASI, audio, computer-assisted self-interview; IAQ, interviewer-administered questionnaire.

**TABLE 7. Preference and perceptions of privacy and honesty regarding the use of the audio, computer-assisted self-interview among injection drug users, Vaccine Preparedness Study, 1996**

	ACASI*		IAQ*		No preference		Do not know	
	No.	%	No.	%	No.	%	No.	%
Preference for future interviews	226	59.9	21	5.6	122	32.4	2	0.5
Which protects privacy best?	201	53.3	32	8.5	121	32.1	16	4.2
With which will people be more honest?	227	60.2	45	11.9	65	17.2	34	9.0

\* ACASI, audio, computer-assisted self-interview; IAQ, interviewer-administered questionnaire.

Among the gay men, our hypothesis was wholly supported. Both unprotected receptive anal intercourse and the number of HIV-positive partners were reported more frequently among those assessed via ACASI. For the IDUs, one of the four items (frequency of injection) did not conform to our hypothesis. For the three remaining items—needle sharing, needle exchange use, and using a needle after another person without cleaning it—the null was rejected. Importantly, the most risky of these behaviors, using a syringe after another person without cleaning it, was reported 2.4 times more often among the subjects assessed by ACASI.

The lower rate of reporting injection frequency of weekly or greater was not anticipated. Either subjects underreported their drug use to the computer or overreported it to interviewers. Although our data cannot resolve this question and further research is obviously warranted, several factors can be considered. First, this finding is consistent with the recently reported findings of a test of ACASI among IDUs attending syringe exchange programs, in that lower rates of injection were reported when assessments were performed using ACASI (18). In addition, drug injection is typically episodic, and since all IDUs were enrolled during a period of their active use, reductions in injection rates at subsequent follow-up visits are not unexpected. Thus, the question posed by our finding is not, "Why do the ACASI respondents report less injection?" Rather it is, "Which estimate of reduced injection is more accurate?" Again, given the context of this assessment, a longitudinal study among self-disclosed drug injectors, it is possible that some noninjecting participants felt that it was more desirable to report continued injection in order to meet expectations of the researchers and remain in the study. Given this scenario, it is plausible that the contextual pressure to report injection was reduced among those assessed via ACASI.

Other findings were quite consistent with our hypothesis of equivalence. Of the 18 additional items examined here, only one yielded a finding that could not be readily explained by the influence of social desirability. The significantly lower reported rate of health coverage among the IDUs assessed by ACASI was unexpected. However, since most of these participants were likely to be enrolled in publicly funded programs undergoing major changes in name and coverage, confusion is not unexpected. It is also possible that there is embarrassment about not having health insurance or having lost it, and the ACASI rate may reflect this stigma. The issue is one that cannot be resolved by these data alone and requires further investigation.

The data reported here remind us that it is the context of the assessment that determines the sensitivity of a particular question. For example, no differences in the rate of reporting were found for many of the items considered quite sensitive in other settings—men having sex with men or visiting a shooting gallery. Conversely, behaviors typically not considered difficult to report in other contexts, such as getting tested for HIV, yielded significantly higher rates when assessed via ACASI among gay men in this study. As would be expected during a vaccine efficacy trial (to avoid unblinding), subjects had been asked to return to the

research site for all HIV testing during the course of the study. Thus, participation in the VPS can be seen as raising the sensitivity of disclosing HIV testing at other locations. ACASI may therefore be particularly useful in monitoring adherence to study expectations during actual trials.

Responses to the acceptability questionnaires provide further evidence of the feasibility of using this technology in studies of IDUs and gay men. All of these participants had been interviewed by study staff at two prior assessments and thus had experienced the assessment via interviewer administration. Those assigned to the ACASI had few problems in using it. Importantly, all of the problems identified—speed of administration, understanding the questions, and ease of making and changing entries—are able to be resolved via programming modifications. When asked which mode of administration they would prefer for future assessments, only a small proportion reported a preference for the IAQ. Importantly, the ACASI was strongly endorsed by respondents from both risk groups as more likely to elicit honest responses.

The use of ACASI technology has the advantage of true standardization of questionnaire administration, a primary objective of epidemiologic research and clinical trials. When IAQ are used, the attainment of such standardization requires a significant amount of training and ongoing supervision. In ACASI applications, questions, probes, and branching are prerecorded and preprogrammed so that all subjects with similar behavioral profiles hear the same voice asking the same questions in the same sequence. Thus, variations in administration caused by the interviewer are eliminated.

Together, these data suggest that the application of ACASI technology in studies of gay men and IDU is both feasible and acceptable. These data also suggest that ACASI improves the measurement of sensitive risk behaviors. In so doing, ACASI provides a useful tool to more accurately understand the behavioral factors associated with HIV transmission and the efficacy of preventive interventions.

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