Measuring HIV/STD Risk Behaviors: Two Telephone Survey Pretests Conducted in 2000

John E. Anderson, Danni Lentine, Sheila L. Knight, Stephen J. Blumberg, Ronald Fichtner
John E. Anderson, Division of HIV/AIDS Prevention, CDC, E-37, Atlanta GA 30333

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Introduction. The ability to measure behaviors, knowledge, beliefs and attitudes related to HIV and sexually transmitted disease (STD) in population groups is necessary for planning and evaluating effective prevention programs (1). One of the most practical means of obtaining this information is through questionnaire-based, self-reported data collection.

Telephone survey methods offer a number of advantages for measuring HIV/STD related behaviors, including lower costs associated with telephone surveys compared with in-person surveys, and better quality control possible with centralized survey administration (2-4); disadvantages of telephone surveys include coverage differences and lower response rates than other survey methods. Many behaviors associated with HIV and STD are sensitive and stigmatized, which may lead to underreporting. Methods of survey data collection that enhance the respondent's sense of privacy can lead to the reporting of higher (and presumably more accurate) levels of risk behaviors (5-7).

In this paper we compare the results of 2 survey pretests that measured HIV/STD risk behaviors using telephone survey methodology. Both surveys used random digit dialed (RDD) methods to obtain samples of adults. Our objectives are to compare the methods and results used in these two surveys, in particular the response rates obtained, the effects of particular questionnaire design differences, and the results of methods that were used to enhance respondent privacy, and to make recommendations for future surveys and methodological studies that measure HIV/STD risk behaviors.

Methods. The first pretest was conducted as a module of the State and Local Area Integrated Telephone Survey (SLAITS), which is conducted by the National Center for Health Statistics, Centers for Disease Control and Prevention (CDC). This survey usually shares the large random-digit-dial sampling frame of the National Immunization Survey (NIS), sponsored by the National Immunization Program at CDC (8). However, for the HIV Testing and STD Risk Behaviors Module field test, the sample was an independent state-wide sample of adults aged 18-49 living or staying in the state of New Jersey (9).

A total of 405 interviews were completed during February and March 2000. Survey topics included health care utilization, health insurance coverage, demographic information, Hepatitis C knowledge, sexually transmitted disease (STD) history, HIV testing, and sexual history. Questions on HIV testing and sexual history were located at the end of the questionnaire. Questions on all topics included on the pretest were tested using focus group interviews.

Of the randomly generated sample telephone numbers, 59.1% were matched to addresses and were sent advance letters. This letter alerted potential respondents to expect a telephone call, and informed them that the survey would include questions about health care services, health insurance, health risk behaviors, and sexual activity. When households were contacted during telephone screening, similar information was provided and consent was obtained. The information provided in the advance letter and during screening was in accordance with human subjects research and informed consent regulations based on review by CDC's Institutional Review Board (IRB).

Household screening identified adults within the eligible age range (18-49). If more than one eligible adult within the specified age range lived in the sampled household, the adult who most recently celebrated his/her birthday was chosen to participate. Selected respondents were randomly assigned to one of two groups: those who would be asked to answer all questions by voice, and those who would answer the sexual history questions using touch-tone data entry. Of the 405 respondents who completed interviews, 191 were assigned to answer all questions by voice; 215 were initially assigned to answer using touch-tone data entry. Respondents who were initially assigned to use touch-tone data entry could choose to answer the sexual history questions by voice, if they preferred. In the touch-tone data entry method, the interviewer read the question and respondent responded by entering a digit on the telephone key pad. The interviewer was then able to read the digit and enter it into the computer-assisted telephone interviewing (CATI) system in the same manner as oral responses.

The second pretest, the Telephone Survey of Risk Behavior (TSORB) was conducted in Baltimore, MD, and was limited to neighborhoods with high rates of STDs (10). The sample was based on 2,500 randomly generated telephone numbers for an urban area in Baltimore, MD, selected based on findings from previous research, which reported high incidence of STDs, and relatively low income and educational levels.

Two data collection modes were tested: standard computer-assisted telephone interviewing (CATI), and

CATI combined with telephone audio computer-assisted self interview (T-ACASI) for the most sensitive items. No advance letters were sent to households for this pretest. The eligibility questions were administered via CATI for both conditions. Once it was determined that a household had been reached with an eligible adult (aged 18-59), and one eligible respondent selected, participation in the survey was requested. The introductory scripts were developed to meet human subjects and informed consent standards, and were reviewed and approved by CDC's IRB. Interviewing took place between July 10 and August 4, 2000. A total of 203 completed interviews were obtained, with 96 assigned to the CATI/T-ACASI administration, and 107 to CATI only. The main goal of the pretest was to obtain 200 interviews in the limited field time allowed. Fewer call backs and attempts at refusal conversion were attempted than in a normal telephone survey.

Once cooperation was obtained, CATI methods were used to administer questions to respondents assigned to either data collection modes in several topic areas: knowledge of HIV/AIDS and tuberculosis, perceived risk of HIV infection, recent blood donations, HIV testing, ethnicity, race, education, and income. The remainder of the interview, containing sensitive questions about risk behaviors was conducted as either T-ACASI or CATI, depending on the random assignment of respondents. The questions, which had been developed through cognitive testing, covered the following topic areas, concentrating on the respondent's behavior within the past 12 months: number of sexual partners, condom use, sex partner's risk behavior, diagnosis and treatment of STD's and drug use. For T-ACASI administration, respondents listened to a recording of each question and entered responses using the telephone key pad. The responses were recorded directly by the computer system with no interaction required with the interviewer. Differences in the two pretests are summarized in Table 1.

Response rates. Both survey pretests achieved low response rates. Respondent participation in telephone surveys has been shown to be declining (11, 12). In the case of measuring sensitive risk behavior with telephone surveys, it is necessary to inform potential respondents of the content of the survey, which may cause some to not participate. The following language was used in the advance letter and introductory telephone scripts for the New Jersey SLAITS pretest:

Table 1
Design Comparison: Two Survey Pretests conducted in 2000

SLAITS, New Jersey	**TSORB - Baltimore**
• State-wide RDD	• RDD, low SES area
• Age 18-49, n=405	• Age 18-59, n=203
• Sex behavior questions	• Sex and drug behavior questions
• Advance letter	• No advance letter
• Standard field procedures	• Limited field time
• Condom use – high risk only	• Condom use asked of all respondents
• Touch tone data entry, sensitive items	• T-ACASI, sensitive items

Advance letter:
"...You may consider some of the questions in this survey sensitive, such as questions on HIV testing or sexual activity. It will be all right to skip any questions you do not want to answer. Participation is voluntary..."

Telephone contact script for selected respondent:
"As the letter stated, you may consider some of the questions in this survey sensitive, such as questions on HIV testing or risk behaviors. Participation is voluntary, and it's all right to skip any questions you don't want to answer."

Similar language was used in the TSORB Baltimore introductory script, which did not use an advance letter:

Telephone contact script for selected respondent:
"...We are collecting information about the best way to ask questions about risk behaviors related to the transmission of HIV, the virus that causes AIDS, and other sexually transmitted diseases, or STDs...Your participation is voluntary and all information will be treated in a confidential manner. You can end the interview at any time..."

This language, which is required for human subjects clearances for surveys of this type, may result in many respondents not participating, since the very sensitive subject matter of the interview is described. The New Jersey SLAITS pretest achieved an overall response rate of 32.2 percent (AAPOR definition 3 (13)), and a cooperation rate (percentage of identified, eligible respondents who completed interviews) of 64.4%. Because of the limited field time and number of call backs, no overall response rate was computed for the Baltimore TSORB pretest. The cooperation rate of 52.2% indicates a response rate that is probably lower than SLAITS.

Questionnaire design differences. The two pretests

differed considerably in the questionnaire sequence covering condom use. Both surveys inquired about condom use "at last sex". Because the level of condom use has been found to differ greatly between main sex partners and other partners (14), the recommended question sequences allow estimation of condom use separately for main and other sex partners. The New Jersey SLAITS pretest asked condom use questions only of those who reported 2 or more partners in the past year, or had other HIV transmission-related risk behaviors.

Table 2
Sex behavior items by interview mode, 2000 SLAITS NJ Pretest

A.. No sex in past 12 months	Pct.	95% CI	No. of Observations	Chi-square P-value
Total	15.7	11.3-20.1	381	
Touch-tone data entry	19.5	12.2-26.8	177	0.15
CATI only	12.8	7.5-18.2	204	
B. 2+ partners in past 12 months				
Total	11.5	7.3-15.8	380	
Touch-tone data entry	12.0	6.2-17.8	176	0.84
CATI only	11.2	5.1-17.3	204	
C. 5+ partners in past 12 months				
Total	1.1	0.0-2.1	376	
Touch-tone data entry	0.9	0.0-2.6	174	0.74
CATI only	1.2	0.0-2.6	202	
D. Used a condom last time with main partner, persons routed to this question				
Total	15.6	4.4-26.8	52	
Touch-tone data entry	24.2	5.3-43.2	30	0.10
CATI only	6.2	0.0-13.0	22	
E. Used condom last time with non-main partner, person routed to this question				
Total	71.9	51.1-92.8	29	
Touch-tone data entry	68.3	40.9-95.6	14	0.77
CATI only	74.3	44.9-100.0	15	

Note: CI: confidence interval; Chi-square test of difference between interview modes

The result of this was that only a minority of the respondents were asked about condom use. Of 381 sexually active respondents, 52 were asked about condom use with main partners, and 29 with other partners. This results in a considerable reduction in statistical power for examining levels and correlates of condom use in this sample.

The TSORB pretest used a somewhat different version of the "last sex" questions. In this sequence respondents are asked a series of questions about the last time they had sex including whether a condom was used and what their relationship was to their sex partner. Similar to other surveys that have asked the questions in this way (14), the number whose last sex partner was someone other than a main partner (n=16) was about one-tenth the number whose last sexual encounter had been with their main partner, in this case 154 respondents.

The TSORB questionnaire contains some newly-developed questions to increase the number of observations when measuring condom use with non-main partners. Respondents whose last sexual encounter was with their main partner were asked whether they had sex with a partner other than their main partner at any time in the past year. If yes, they were asked if they used a condom the last time they had sex with that partner. Although the total number of observations is small, the TSORB pretest is the first time this particular sequence has been used in an actual survey. The pretest found that this roughly doubled the number of observations on which condom use with non-main partners is based, from 16 to 33 observations.

Effects of enhanced interviewing methods. Both survey pretests contained randomized tests of the effects of methods to enhance the respondent's sense of privacy. The New Jersey SLAITS pretests found little difference in the basic sexual risk behaviors that are measured in surveys of this type. As Table 2 indicates there are no statistically significant differences between respondents

interviewed by interviewer administration and by touch tone data-entry for sexual activity in the past year, numbers of sex partners, or condom use. (The results in Table 2 are based on weighting factors to compensate for unequal sampling probabilities and non-response, and are adjusted for the complex sample design.) Small sample sizes for the condom use questions (because of questionnaire skips for these questions that were discussed earlier) may have resulted in non-significant differences for condom use items. (As reported elsewhere, the SLAITS pretest found statistically significantly higher percentages reporting 3 items with the touch-tone data entry. These items were: worrying about contracting AIDS or STDs, membership in one of 6 risk categories, and having had oral sex with non-main partners (8).)

For the TSORB Baltimore pretest, reporting differences can be compared for CATI versus T-ACASI administration of the basic risk behavior items (Table 3). (Results for TSORB are unweighted and are not adjusted for effects of the sample design.) For STD history,

Table 3
Responses to sensitive items by interview mode
2000 TSORB Pretest, Baltimore

	Pct.	95% C.I.	No. of Observations	Chi-square P-value
A. Had STD in the past 5 years				
Total	8.0	2.7-13.2	201	
T-ACASI	7.4	0.0-14.9	94	0.80
CATI only	8.4	1.0-15.8	107	
B. Ever injected drugs				
Total	5.0	0.8-9.1	202	
T-ACASI	4.2	0.0-9.9	95	0.65
CATI only	5.6	0.0-11.7	107	
C. Ever use crack cocaine				
Total	7.9	2.7-13.1	202	
T-ACASI	5.3	0.0-11.6	95	0.18
CATI only	10.3	2.2-18.4	107	
D. Condom use at last sex -- all				
Total	32.0	22.2-41.8	172	
T-ACASI	28.9	15.7-42.0	90	0.36
CATI only	35.4	20.8-49.9	82	
E. 2 or more sex partners in past year				
Total	15.8	8.5-23.1	190	
T-ACASI	21.3	9.4-33.3	89	0.052
CATI only	10.9	2.4-19.4	101	
F. 5 or more sex partners in past year				
Total	3.7	0.0-7.4	190	
T-ACASI	5.6	0.0-12.3	89	0.20
CATI only	2.0	0.0-5.8	101	

injection drug use, crack cocaine use, and condom use there are no apparent patterns of difference. Compared with CATI-only respondents, persons interviewed with T-ACASI reported about 2 times the percentage with 2 or more, and with 5 or more sex partners in the past year. These differences appear to approach, but not meet, statistical significance. Given the small sample size of the Baltimore TSORB pretest, the results suggest that significant increases in reporting numbers of sexual partners might be obtained under T-ACASI. This does not appear to be the case with drug risk variables.

Discussion. These two survey pretests were limited in scale, but nevertheless provide a number of lessons for

future work in this area. Telephone surveys provide a cost effective means of obtaining information on HIV/STD risk related behavior in populations, but as with all surveys, data must be carefully evaluated. Response rates for surveys have been declining, and telephone surveys have been particularly hard hit (11,12). The two pretests conducted in 2000 discussed in this paper had especially low response rates. It may be more difficult to achieve high response rates with surveys of HIV and STD risk than in surveys of less sensitive health topics. Because of the very private nature of the material covered, conducting these surveys requires a great deal of care. This includes describing the topics to be covered in some detail in advance materials and contact scripts. When highly private subject matter is mentioned, it may be easier for respondents (who are becoming more reluctant to participate in any surveys) to refuse to participate. Unless methods to increase response rates can be developed, it is unlikely that these methods will be of much use to prevention programs.

It has been found to be more difficult to attain high response rates in telephone surveys that have no advance contact (15,16). One conclusion is that advance letters should be used in telephone surveys of HIV/STD risk behavior. Use of advance letters requires matching of randomly generated telephone numbers with addresses, and this matching is typically less then complete. The SLAITS New Jersey pretest reported on here was able to match addresses to only 59% of the sample phone numbers. Another issue is whether advance letters that are explicit in describing survey subject matter (as required because of human subjects concerns), might actually cause potential respondents to not participate when contacted later by phone for the interview.

In the New Jersey SLAITS pretest only persons reporting 2 or more partners, or some other HIV risk factor were asked about condom use questions. This routing was done because of concerns about the sensitivity of asking questions about condoms. The result was relatively few observations for the condom use questions. This may have limited the ability to test the effect of the touch-tone data entry on reporting of condom use. It also seriously limits the ability to compare the survey results with other surveys (that asked condom use of all respondents), or to use the data to track prevention goals related to the percentage of adults using condoms (17).

A new sequence of questions used for the first time on the Baltimore TSORB pretest increased the number of observations of condom use with partners other than main partners. This modification doubled the number of observations for this relatively small category.

The touch-tone method has great potential for collecting sensitive information in telephone surveys. It requires considerably fewer resources than the T-ACASI method, and essentially collects data using the standard CATI method of data entry, with no additional programming costs. The use of the touch-tone data entry methods in New Jersey SLAITS pretest did not result in statistically significant differences in reporting basic sexual risk items (although it was associated with increased reporting of a small number of behavioral and attitude items). This method has been found to increase reporting in other surveys (18). Because of this potential and the relative cost-effectiveness it should be subject to further testing.

The TSORB Baltimore test of T-ACASI methods found effects in reporting numbers of partners which approached the level of statistical significance. Unlike other surveys (5-7), there was no apparent effect of T-ACASI on reporting illegal drug use. These results may be related to the small sample size of this pretest. A larger test (n=650) of this methodology in different populations is scheduled for 2001 and may lead to more clear cut effects of the T-ACASI method.

References

1. Miller HG, Turner CF, Moses LE, Eds., AIDS: The Second Decade, Washington DC: National Academy Press, 1990, p. 365.
2. Aquilino W. Telephone versus face-to-face interviewing for household drug use surveys. *International Journal of the Addictions*. 1992;27(1):71-91.
3. Catania J, Coates T, Stall R, et al. Prevalence of AIDS-related risk factors and condom use in the United States. *Science*. 1992;258(13):1101-1105.
4. Blair J. A probability sample of gay urban males: The use of two-phase adaptive sampling. *J Sex Res*. 1999;36:39-44.
5. Turner, CF, Ku, L., Rogers, SM, Lindberg, LD, Pleck, JH, & Sonenstein, FL (1998). Adolescent sexual behavior, drug use, and violence: Increased reporting with computer survey technology. *Science*, *280*, 867-873.
6. DesJarlais, DC, Paone, D, Milliken, J, Turner, CF, Miller, H., Gribble, J., Shi, Q., Hagan, H., & Friedman, SR. (1999). Audio-computer interviewing to measure risk behaviour for HIV among injecting drug users: A quasi-randomised trial. *Lancet, 353*, 1657-1361.
7. Gribble, JN, Miller, HG, Cooley, PC, Catania, JA, Pollack, L, & Turner, CF (2000). The impact of T-ACASI interviewing on reported drug use among men who have sex with men. *Substance Use and Misuse, 35*, 869-890.
8. Blumberg SJ, Cynamon, ML, Osborn L, Olson, L.. The Impact fo Touch-tone Data Entry in Telephone Interviews on HIV/STD Risk Behaviors, presented at 2001 annual meetings, AAPOR, Montreal, May 2001.
9. Ezzati-Rice, TM, Cynamon, M, Blumberg, SJ, & Madans, JH (2000). Use of an existing sampling frame to collect broad-based health and health-related data at the

state and local level. *Federal Committee on Statistical Methodology Statistical Policy Working Paper Series, 30*, 283-292.
10. Research Triangle Institute, Telephone Survey Measuring HIV/STD Risk Behavior Using Standard Methodology : Pretest Report, Contract No. 200-96-0511, Task Order #3, RTI Project Number 6705.003, September 2000.
11. Interagency Household Survey Nonresponse Group. (1999). Household nonresponse: What we have learned and a framework for further work. Unpublished paper.
12. Groves, RM & Couper, MP (1998). *Nonresponse in household interview surveys*. New York: John Wiley & Sons.
13. American Association for Public Opinion Research. (2000). *Standard definitions: Final dispositions of case codes and outcome rates for surveys.* Ann Arbor, MI.
14. Anderson J, Wilson R, Doll L, Jones TS, Barker P. Condom use and HIV risk behaviors among U.S. adults: Data from a national survey, *Family Planning Perspectives*, 1999, 31(1): 24-28.
15. Traugott, MW, Groves, RM, & Lepkowski, JM (1986). Using dual frame designs to reduce nonresponse in telephone surveys. *Public Opinion Quarterly*, *51*, 522-539.
16. Smith, W, Chey, T, Jalaludin, B, Salkeld, G, & Capon, T. (1995). Increasing response rates in telephone surveys: A randomized trial. *Journal of Public Health Medicine*, *17*, 33-38.
17. US Department of Health and Human Services, http://www.health.gov/healthypeople/.
18. Turner, CF, Forsyth, BH, O'Reilly, JM, Cooley, PC, Smith, TK, Rogers, SM, & Miller, HG. (1998). Automated self-interviewing and the survey measurement of sensitive behaviors. In MP Cooper, RP Baker, J Bethlehem, CZF Clark, J Martin, WL Nicholls, JM O'Reilly (Eds.), *Computer assisted survey information collection* (pp. 455-473). New York: John Wiley & Sons, Inc.