

IMPACT OF INTERVIEWER EXPERIENCE ON DRUG PREVALENCE RATES IN THE 1999 NHSDA

Arthur L. Hughes, SAMHSA, James R. Chromy, Katherine Giacoletti, and Dawn M. Odom, Research Triangle Institute

Arthur L. Hughes, SAMHSA, 5600 Fishers Lane, Room 16-105, Rockville, MD 20857

Key words: interviewer experience, paper-and-pencil interviewing, household surveys, illicit drug use, logistic regression

1. Introduction

The National Household Survey on Drug Abuse (NHSDA) is the primary source of information on drug use and associated behaviors in the general population. Part of the redesign in 1999 included a change in the primary mode of data collection from paper-and-pencil interviewing (PAPI) to computer-assisted interviewing (CAI). In addition, the sample design changed from a national-based design to a state-based design resulting in a dramatic increase in sample size and number of field interviewers. During that same year, a supplemental sample was collected using PAPI in order to measure change between 1999 and earlier years. Because the PAPI survey was administered in conjunction with the new CAI state survey, the sample size in 1999 increased to approximately three times the previous year's total. Consequentially, it was necessary to hire a greater number of interviews than previous years which resulted in a higher proportion of inexperienced interviewers. Unlike previous years, new interviewing staff turnover was also high requiring additional training of newly hired interviewers and contributing to general inexperience in the interviewing staff for both surveys.

Analysis of year-to-year change based on comparable PAPI designs showed unanticipated and unusually large increases in substance use from 1998 to 1999 and showed, in general, that NHSDA interviewer

experience tended to reduce estimates of substance use, while no NHSDA experience contributed to higher estimates.

Research on the effect of interviewer experience on drug use is not entirely new. Turner, Lessler, and Devore (1992) show past year marijuana use based on data collected from interviewers with no NHSDA experience was 1.4 times higher than that of experienced interviewers. For past year cocaine use, inexperienced interviewers had rates that were almost twice as high. For alcohol and cigarettes, these ratios were generally about the same. However, this analysis was descriptive and thus, did not control on demographic or geographic covariates that may help explain some of these differences.

2. Initial Investigation

Initial analysis of substance use trends based on 1998 and 1999 PAPI data indicated unexpected increases in lifetime use of any illicit drug along with other measures such as nonmedical use of any psychotherapeutic drug. To investigate this issue weighting, editing, and imputation procedures were examined to see if any procedural changes or errors could have been responsible for the unexpected results. Extensive analysis revealed no technical problems associated with any of these factors.

As part of this inquiry, the level of field interviewer experience was also studied. An interviewer was classified as having NHSDA some experience in a given year if he/she conducted at least one NHSDA interview in the prior year. For some drugs, this analysis

revealed a progressive decline in reported prevalence rates as interviewer experience increased over the survey year. Interviews conducted by interviewers with NHSDA experience also showed lower prevalence rates from the outset. Tables 1 and 2 show estimates of lifetime use of any illicit drug and nonmedical use of any psychotherapeutic by interviewer experience (no NHSDA experience, some NHSDA experience) and by interview order which is a measure of experience level over the course of the survey year (1=first interview conducted, 100=100th interviews conducted). From table 1, it can be seen that estimated rates of lifetime use of any illicit drug are higher among earlier interviews than those that took place later in the survey year, and that rates within a given year and interview order are higher among interviewers with no NHSDA experience. Although the trend is not as strong in 1999 for previous experience, the same pattern still occurs. One reason for this may be that most 1999 interviewers had no experience. Yet, given the 1999 interviewers with no experience, the prevalence rates earlier in the year are still higher than after these interviewers gained experience within the year.

3. Development of Interviewer Experience Measures

In 1999 the PAPI sample was reduced somewhat and a large 50 state sample using CAI was initiated resulting in an increase in sample size from 25,500 completed interviews in 1998 to over 80,500 completed interviews in 1999 (PAPI and CAI combined). As a result, it was necessary to hire many more new interviewers for both the PAPI and CAI survey components. All interviewers (with and without NHSDA survey experience) participated in an extensive training session either at the beginning of the year (for initial hires) or later in the year (for replacement hires). The 1999 training covered all aspects

of survey work including field sampling, administrative procedures, obtaining cooperation, household screening, and the interviewing process itself. All interviewers were sent a home study package and expected to spend between 24-32 hours of self-study prior to attending classroom training. Relatively more classroom time (seven days) was spent on the CAI interview since it involved new computer-assisted procedures; however, all PAPI interviewers received an additional day of instruction on the unique aspects of paper and pencil interviewing. Table 3 presents counts of both interviewers and completed interviews by interviewer experience for 1998 and 1999. Note that 188 interviewers with NHSDA experience participated in the 1999 PAPI survey, almost as many as the 195 interviewers with NHSDA interviewing experience who were carried over in 1998. In 1999, all PAPI interviewers also conducted an equal or larger number of CAI interviews. As a result, it was necessary to hire many more interviewers to work in areas where both PAPI and CAI interviewing were conducted. Interviewers with NHSDA experience constituted only about 19 percent of total PAPI interviewers in 1999 compared to about 40 percent in 1998.

Generally, experienced interviewers conduct more interviews than interviewers with no previous NHSDA experience since most start work at the beginning of the survey year and are more likely to remain with the project for the full year. Thus, in both 1998 and 1999, the experienced interviewers conducted more than their proportional share of the PAPI interviews. However, an even more significant difference can be seen in the number of interviews conducted by experienced interviewers in 1998 relative to 1999. Note that only 31 percent of 1999 PAPI interviews were conducted by experienced interviewers compared to 67 percent in 1998 (see table 3).

Since interviewers also gain experience and learn to adapt their approaches as they continue to conduct additional interviews during a survey year, one measure of current year experience is based on the ordinal number of each interview in the current year's survey. This measure can be viewed as measuring both recent experience and time since last formal training. An ordinal number was assigned to each interview conducted by an interviewer in the current year based on the date (and time, if necessary) of the interview. This was assigned combining both CAI and PAPI cases for interviewers who had both types.

Table 4 show the unweighted distribution of interviews by both interviewer experience measures for 1998 and 1999. Note that a higher proportion of 1999 PAPI cases were conducted early in the interviewers' current year experience, compared to 1998. This is not due to combining order across both CAI and PAPI cases since that would tend to increase the order number; it more likely reflects the fact that the workload for interviewers tended to be smaller in 1999 because of early resignations and shorter periods of employment.

4. Modeling the Effects of Interviewer Experience

Efforts were made to examine the possible effects of adjusting for interview experience on measures of change for reported prevalence measures of lifetime, past year, and past month use for three substances: any illicit drug, marijuana, and nonmedical use of any psychotherapeutic (table 5).

For modeling the effects of interviewer experience in these tables logistic regression was used and the results are shown in terms of odds ratios. RTI's (Research Triangle

Institute) SUDAAN was employed and the analysis weights were used for both years. The sample structure was represented using standard NHSDA analysis NEST statements for variance strata and variance replicates. Since a new design was introduced in 1999, no allowance was made for any overlap in the sample structure. In these models, the response variable was drug use (dichotomous outcome, 1=yes, 0=no). Odds ratios shown with an asterisk and greater than 1 for the "change from 1998 to 1999" effect indicate that 1999 estimates are significantly higher than 1998 estimates ($\alpha=0.05$). Results are shown before and after adjustment for demographics, interviewer experience, and interview order. In all cases, adjustment reduces the magnitude of the year to year change, and in many cases moves it from a statistically significant change to a non-significant change. In addition to interviewer experience (2 levels) and interview order (5 levels), other covariates used in these models were year (1998 and 1999), age (12-17, 18-25, 26-34, and 35+); census region (Northeast, North Central, South, and West); gender (male, female); race/ethnicity (Hispanic, non-Hispanic black, and non-Hispanic all other races); and population density (1 million or more persons in a Metropolitan Statistical Area (MSA); 250,000 to 999,999 persons in an MSA, less than 250,000 persons in an MSA, persons not in an MSA and not in a rural area, and persons not in an MSA and in a rural area). Results are shown before and after adjustment for demographics, interviewer experience, and interview order. Across drugs, the adjustment reduces the magnitude of the year to year change, and generally moves it from a statistically significant change to a non-significant change.

Adjustment of model estimates of annual change in substance use (1998 to 1999) showed a consistent pattern of reducing 1999

drug use estimates relative to 1998 estimates. Thus, it appears that much of the observed annual change in prevalence is an artifact of the changing mix in interview experience across the two years.

6. Adjustment Procedures

At this point in the analysis, it was determined that changes in the mix of interviewers with and without NHSDA interviewing experience between 1998 and 1999 had an impact on the estimates of year-to-year change, and that an adjustment procedure had to be developed and used in order to present 1999 PAPI estimates. The approach used was to adjust the 1999 survey weights to account for the interviewer experience distribution observed in 1998. Specifically, two levels of NHSDA interview experience (NHSDA experience and no NHSDA experience) and three levels of the interview order number (1-19, 20-99, and 100+) from the 1998 data were incorporated into the set of control totals in the poststratification step of the 1999 weighting process. As a result, the realized design effect for the total sample increased from 3.01 to 5.77 because, on average, the adjusted weights were about twice as large as the original weights for the NHSDA experience interviewer data while being cut in half for data corresponding to interviewers with no NHSDA experience.

In general, and as expected, the adjusted 1999 PAPI estimates were lower than unadjusted estimates for the illicit drugs. However, the adjusted estimates will have limited use due to significantly higher variability induced by the weight adjustment.

7. Conclusion

The analysis presented here indicates that the vastly uneven mix of experienced and inexperienced NHSDA field interviewers

between 1999 and 1998 had a profound effect on estimated drug use rates in 1999. It was found that data collected by interviewers with no NHSDA experience resulted in higher drug use rates than data collected by interviewers with NHSDA experience. Even when controlling for additional variables that were thought to be correlated with interviewer experience, the experience effect remained. This led to the decision to produce a new set of 1999 PAPI analysis weights that essentially adjusted the original 1999 PAPI weights to represent the distribution of interviewer experience levels observed in 1998. These adjusted estimates will portray a better picture of changing trends than the original estimates; however, the increased variability may result in over- or underestimation of the 1999 rates.

References

Turner, C., Lessler, J., and Devore, J. (1992). *Effects of Mode of Administration and Wording on Reporting of Drug Use*, In Turner, C., Lessler, J. and Gfroerer, J., Eds. Survey Measurement of Drug Use: Methodologic Studies, DHHS Pub. No. (ADM) 92-1929.

Table 1. Percent Reporting Lifetime Use of Any Illicit Drug by Survey Year, Interview Order and NHSDA Interviewer Experience

Interview Order	1998			1999 PAPI		
	No Experience	Some Experience	All	No Experience	Some Experience	All
1-19	40.9	35.5	38.4	39.9	36.3	39.3
20-39	38.7	32.6	35.2	40.3	41.8	40.7
40-59	38.2	33.7	35.2	38.0	37.7	37.9
60-99	39.0	32.1	34.2	37.7	37.8	37.7
100 +	43.2	31.7	34.2	35.7	30.6	33.8
All Interviews	40.1	33.1	35.8	38.9	37.1	38.5

Table 2. Percent Reporting Lifetime Nonmedical Use of Any Psychotherapeutic by Survey Year, Interview Order and NHSDA Interviewer Experience

Interview Order	1998			1999 PAPI		
	No Experience	Some Experience	All	No Experience	Some Experience	All
1-19	14.6	8.2	11.6	13.3	13.8	13.4
20-39	10.7	7.9	9.1	11.9	10.9	11.7
40-59	8.8	8.4	8.6	12.7	7.2	11.1
60-99	11.2	7.5	8.6	10.6	8.5	10.0
100 +	12.7	5.2	6.9	9.2	6.7	8.2
All Interviews	12.2	7.4	9.2	12.0	9.7	11.4

Table 3. Interviewers and Interviews by NHSDA Interviewer Experience Distribution

Interviewer Experience	PAPI Interviewers				PAPI Interviews			
	1998		1999		1998		1999	
	No.	%	No.	%	No.	%	No.	%
None	296	60.29	805	81.07	8,407	32.97	9,526	68.98
Some	195	39.71	188	18.93	17,093	67.03	4,283	31.02
Total	491	100.00	993	100.00	25,500	100.00	13,809	100.00

Table 4. Distribution of PAPI Interviews by Interview Order and NHSDA Interviewer Experience

Interview Order	1998					1999				
	No Experience		Some Experience		Total	No Experience		Some Experience		Total
	No.	%	No.	%	%	No.	%	No.	%	%
1-19	3,049	11.96	3,368	13.21	25.16	4,083	29.57	1,226	8.88	38.45
20-39	1,928	7.56	3,162	12.40	19.96	2,276	16.48	1,030	7.46	23.94
40-59	1,213	4.76	2,607	10.22	14.98	1,146	8.30	670	4.85	13.15
60-99	1,217	4.77	3,491	13.69	18.46	1,249	9.04	737	5.34	14.38
100 +	1,000	3.92	4,465	17.51	21.43	772	5.59	620	4.49	10.08
Subtotals	8,407	32.97	17,093	67.03	100.00	9,526	68.98	4,283	31.02	100.00
Total	25,500					13,809				

Table 5. Odds Ratios for Year, NHSDA Interviewer Experience, and Order Effects for Any Illicit Drug, Marijuana, and Nonmedical Use of Any Psychotherapeutic

Description	Any Illicit			Marijuana			Any Psychotherapeutics		
	Life-time	Past year	Past Month	Life-time	Past year	Past Month	Life-time	Past year	Past Month
Change from 1998 to 1999									
Before adjustment	1.12*	1.23*	1.22*	1.08	1.15*	1.13	1.26	1.50	1.68*
After adjustment	1.06	1.14*	1.15*	1.04	1.10	1.08	1.10	1.28	1.41*
Interviewer experience									
None (reference class)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Some NHSDA	0.84*	0.78*	0.83*	0.90*	0.82*	0.86	0.69*	0.64	0.59*
Interview order									
1-19 (reference class)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20-39	0.98	0.93	0.94	0.99	0.88	0.89	0.83	0.99	1.18
40-59	0.93	0.98	0.98	0.98	0.99	1.02	0.80	0.82	0.85
60-99	0.89	1.00	0.97	0.93	1.04	1.01	0.74	0.84	0.99
100+	0.84*	0.86	0.92	0.87*	0.94	0.93	0.61	0.77	0.87

*Odds ratio is statistically different from 1.00 at the 0.05 level of significance.