

SUBSTANCE ABUSE PREVALENCE AND TREATMENT UTILIZATION AMONG AMERICAN INDIANS RESIDING ON-RESERVATION

Mindy Herman-Stahl, Ph.D., and Jenny Chong, Ph.D.

Abstract: American Indians residing on-reservation were interviewed regarding their substance use and treatment utilization. One-third had a current substance abuse problem. Predictors included gender, tribe, age, employment status, household income, and educational attainment. Almost two-thirds of those with substance abuse problems had received no treatment within the past year. A combination of formal and informal treatment was the most common approach. Treatment utilization was predicted by gender, age, and insurance coverage.

Planning for substance abuse prevention and treatment services among American Indians living on reservation is a formidable task. While numerous stereotypes of American Indian drinking patterns have proliferated, actual research has lagged behind in supporting or refuting these assumptions (May, 1994). Anecdotal information attests to serious alcohol abuse problems on reservations. In a survey of over 60 American Indian reservations, 70% rated substance abuse problems among the top three health priorities (McKenzie, 1994). However, little empirical evidence exists about the true level of need among this population.

In the absence of up-to-date studies, public health specialists have relied on measures of mortality and morbidity. These measures indicate that alcohol abuse is a major factor in five of the ten leading causes of death among American Indians, and data suggest that 17% to 19% of all American Indian deaths are alcohol-related. American Indians suffer disproportionately from alcohol-related accidents, cirrhosis of the liver, homicide, and suicide (Indian Health Service [IHS], 1996). Analysis of 1991-1993 Indian Health Service (IHS) service area data indicate that the American Indian age-adjusted mortality as compared to all other races was 465% greater for alcoholism, 184% greater for accidents, 46% greater for suicide,

and 39% greater for homicide (IHS, 1996). While these data are alarming, they should not be used to propagate more stereotypes of American Indian drinking. May (1994) asserts that the mortality rate also may be increased by characteristics of rural living such as higher-risk environments, distance to medical care, less frequent use of seatbelts, and lower access to health services. In fact, several studies have shown that the proportion of nondrinkers is higher among American Indian adults than the general population (May, 1989). However, among American Indians who do drink, the proportion of problem drinkers appears to be much greater than the general population, and American Indian drinkers are more likely than non-Indian drinkers to drink large quantities, suffer blackouts, and experience a higher proportion of alcohol-related problems (May, 1994). This is true for American Indian youth as well, who have been found to initiate drug use earlier, drink heavier, and suffer from more negative consequences from drinking (Beauvais, Oetting, & Edwards, 1985).

Conducting large-scale, representative surveys of American Indians residing on reservation is difficult. The few that have been published are quite dated (Roy, Choudhuri, & Irvine, 1970; Sampath, 1974; Shore, Kinzie, Hampson, & Pattison, 1973). However, in 1988 a replication of one of the original psychiatric epidemiologic surveys was conducted (19 years after the original study) by Shore and colleagues in the same American Indian village (Kinzie, et al., 1992; Leung, Kinzie, Boehnlein, & Shore, 1993). Although rates of alcohol abuse and dependence as well as other psychiatric impairments had fallen over the years, the prevalence of alcohol use disorders was still strikingly high with three-quarters of the men (over age 20) and 39.4% of the women having a lifetime alcohol use disorder. Lifetime prevalence rates for alcohol use disorders were more than 3 times higher than those for the general population found in the Epidemiologic Catchment Area (ECA) study (Regier et al., 1988). Point prevalence estimates for alcohol were 36.4% for men and 7.0% for women. Rates were similarly high in a study of almost 2,500 American Indians residing on nine different reservations in South Dakota: approximately 30% were found to be in need of substance abuse treatment (Bray, Dalberth, Herman-Stahl, Walker, & Sanchez, 1999). A cross-sectional study comparing the CAGE to the Diagnostic and Statistic Manual Third Edition-Revised (DSM-III-R) found that 85% of men and 53% of women had lifetime diagnoses of alcohol dependence as assessed by the DSM-III-R (Saremi et al., 2001). Another epidemiologic survey on alcohol abuse and dependence found that 51% of American Indians living in three different reservation communities (including Pueblo, Plains, and Plateau cultures) had problems with alcohol. Men, young adults, and the unmarried had the highest rates of alcohol problems. Bereaved individuals and those experiencing high degrees of stress were also more prone to alcohol disorders (Manson, Shore, Baron, Ackerson, & Neligh, 1992).

While alcoholism among American Indians has been much discussed, little attention has been paid to emerging drug problems. Data on drug problems among American Indian adults is scant, although there is available information on the prevalence of illicit drug use among adolescents. Beauvais and Oetting and their colleagues at the Tri-Ethnic Center for Prevention have extensively studied the patterns of alcohol and drug use among American Indian youth (Beauvais, 1992a). They found that drug use was higher among American Indian youth than their non-Indian counterparts. Rates of lifetime use were particularly high for marijuana (83% vs. 35%), cocaine (23% vs. 6%), stimulants (37% vs. 12%), and hallucinogens (27% vs. 4%) (National Institute on Drug Abuse [NIDA], 1995). These data highlight the potential problems of drug use on reservations but do not provide any accurate indication of the number of adults who have drug abuse problems.

Because rates of alcohol-related problems appear higher among American Indians, information regarding access to treatment, particularly for those living on geographically isolated reservations is critical. There are numerous barriers to accessing and receiving qualified substance abuse services on reservation. Results from the National Medical Expenditure Survey demonstrate that American Indians encounter longer travel and waiting times and thus make fewer appointments for health care services in general (Beauregard, Cunningham, & Cornelius, 1991). Resource constraints, managed care, distance, and conversion to tribal compacting have all complicated the service delivery system (Manson, 2000; Noren, Kindig, & Sprenger, 1998). Common barriers identified in a survey of Native American Health Programs (McKenzie, 1994) included limited access, limited availability of specialty consultation, culturally insensitive services, inadequate data systems, confusion regarding eligibility, and incomplete infrastructure development. Moreover, American Indians residing in urban areas with no culturally competent treatment programs often return to reservations thus draining the resources available for those residing on-reservation (Center for Substance Abuse Treatment [CSAT], 1999). The types of treatments sought by American Indians may differ as many seek a more holistic approach to treatment that incorporates traditional values, beliefs, ceremonies, and processes (CSAT, 1999). Traditional healing is an important mental health resource and many Native healers are active in American Indian communities although utilization of healers is generally a private matter (Abbott, 1998; Nelson, McCoy, Stetter, & Vanderwagen, 1992).

The purpose of this study is two-fold: (a) to provide rigorous data regarding the level and correlates of substance abuse problems among American Indians on reservation in Arizona; and (b) to examine the frequency, characteristics, and correlates of substance abuse treatment

utilization among reservation-based American Indians. American Indian's utilization of both formal and informal treatment, including traditional methods of healing will be assessed.

Method

Background

In an effort to improve the quality of information used in planning state substance abuse treatment services, the Center for Substance Abuse Treatment (CSAT) initiated a series of request for proposals (RFP) to provide funding and technical assistance to state public health officials interested in collecting rigorous data to inform substance abuse policy and planning decisions. In September 1994, the Arizona Department of Health Services received funding to conduct studies throughout the state to determine the prevalence of substance abuse and dependence and the need for treatment. American Indians comprise 5-6% of the total population in Arizona and three-quarters of them live on reservation land. Reservations located in counties with high indicators of substance abuse (e.g., alcohol-related mortality, morbidity, and traffic accidents) were selected to participate. These proxy indicators were used since there were no reservation-specific indicators available. Before the study was conducted, approval was obtained from tribal councils, as well as tribal health departments and reservation-based substance abuse treatment centers. Presentations to the tribal councils regarding the purpose and benefits of the study, as well as the critical need for such information on the reservation were made. The tribal councils of all three reservations approved participation. The next step was to form community-planning committees involving persons from various agencies connected to issues of substance abuse in order to ensure that the study was conducted in a culturally sensitive fashion and addressed issues of primary concern to the community.

Data Collection

Data were collected by trained community members on each reservation. All interviewers were American Indian and accepted members of the community. Interviewers were recruited through several methods: recommendations by members of the planning committee, advertising through word of mouth, and recommendations by other researchers who had trained and employed American Indians for other studies conducted on the reservations. All interviewers conducted face-to-face surveys using laptop computers. Several days of training were conducted to teach

interviewers computer-assisted personal interviewing (CAPI) and to increase their knowledge of substance abuse and treatment and referral issues. Interviewers were fully trained on protection of confidentiality since fear of lack of confidentiality was thought to be the major reason inhibiting participation. No information about compromised confidentiality was ever transmitted back to the researchers or, to our knowledge, the tribal council or participating agencies. Furthermore, no interviewers were dismissed from the study due to inappropriate or unethical actions. Trainers monitored interviewers within the first several weeks of training to provide constructive feedback and ensure quality control. Monitoring continued throughout the data collection period. The majority of interviews (90%) were conducted in English although several interviewers were bilingual (to their Native language) and in some cases, particularly when interviewing elders, interviewers switched between English and the Native language (8.6%). Ten interviews (1.4%) were conducted predominantly in the Native language. Key words were translated and provided to interviewers to promote standardization in cases where Traditional language was inserted.

Sampling

Because substance abuse problems did not appear to concentrate in specific areas of the reservations, households were selected using skip patterns from random starting points. Household (or house lot) maps of every village or district were obtained from the relevant tribal agencies. Using an estimated 25% prevalence rate of substance abuse, an alpha set at 0.05, an estimated refusal rate of 10%-20%, and 80% power, the total number of house lots to be targeted on each reservation was determined. The proportion of ineligible households (e.g., Non-American Indian, non-residential) and vacant or unoccupied house lots were based on Census data or information provided by other agencies such as HUD or emergency services. Refusal rates were determined by speaking with experts who had conducted or were knowledgeable about conducting household surveys on the reservation. Seven percent of homes were vacant or unoccupied in Tribe A and two houses were ineligible because residents were not enrolled American Indians. Thirty-three percent of lots were vacant in Tribe B. Within Tribe C, 25% of house lots were vacant and 5% turned out to be businesses. Once a home was targeted, interviewers dropped off material about the study at the home including an article discussing the study published in the local newspaper and a copy of the tribal resolution supporting the study. Only adults 18 years of age and over who were enrolled members of the tribe were invited to participate. Individuals with the most recent birthday were selected in order to reduce selection bias. Participants were compensated for their time by payment of \$19.00 or a voucher worth \$19.00 for use at the local supermarket. To minimize bias, all

eligible households were contacted up to 10 times to ensure that the hard-to-reach were not systematically missed. No aggressive efforts were made to convert refusals, although interviewers were trained on techniques of gentle persuasion. The survey was carried out between 1996 and 1997. A total of 725 completed surveys were obtained, with the response rate calculated at 92% (the number of participating households/total eligible households contacted). Five individuals refused to participate from Tribe A, eight persons refused to be surveyed from Tribe B, and 25 persons refused at Tribe C. Reasons for refusal included disbelief in the usefulness of surveys, dissatisfaction with the Health Department, unwillingness to answer personal questions, inconvenient times, and disinterest. No information is available for comparing differences between those who agreed versus refused to participate in the survey. The low refusal rate was likely due to repeated attempts by interviewers to contact homes combined with the strong emotions elicited by the topic among community members who felt compelled to do something to help address the destruction caused by alcohol and drug use in their communities.

Instruments

Data were collected using a survey designed by the National Technical Center for substance Abuse Needs Assessment at Harvard University. Diagnoses of substance abuse and dependence were made using a modified version of the Substance Abuse Module of the Diagnostic Interview Schedule (DIS-SAM) (Robbins, Cottler, & Babor, 1990) with diagnostic criteria from the fourth edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM IV) (American Psychiatric Association, 1994). Diagnoses for the following substances were calculated based on the presence and duration of symptoms: alcohol, marijuana, hallucinogens, cocaine, opiates, stimulants, depressants, and inhalants. This instrument has shown adequate reliability and validity in minority populations and has been successfully used with American Indians (Manson et al., 1992). The instrument was pilot tested at a American Indian residential treatment facility. Minor adaptations were made to the instrument to ensure that it was culturally relevant and addressed issues germane to reservation life.

Individuals were screened into the diagnostic portion of the interview if they reported using alcohol or drugs within the past 18 months (ceremonial use of peyote was excluded during screening). Those who qualified for a lifetime abuse or dependence diagnosis and who experienced one or more symptoms in the past 12 months were determined to have a substance abuse problem and were considered in need of treatment.

Socio-demographic information was captured using single descriptive items. Respondents were asked whether they had any of the

following types of insurance: private health insurance, Medicaid or AHCCCS (i.e., Arizona Health Care Cost Containment System - Arizona's Medicaid program), Medicare, veterans or military benefits, Indian Health Service (IHS)¹, other, or no health insurance. Employment was assessed by asking individuals which of the following described their situation: employed full-time; employed, but on family leave or on leave for some other reason; employed part-time; unemployed; seasonal worker; full-time homemaker; or self-employed. Income was assessed by asking respondents whether their income was over or under \$15,000 and then reading choices within \$5,000 increments (e.g., 0-\$5,000, \$5,001-\$9,999, etc.). Educational attainment was measured by asking respondents how much school they had completed (no school, 1st-8th grade, some high school but no diploma, high school graduate or equivalent like GED, some college but no degree, associate degree, college degree, or advanced degree). All respondents who reported use of alcohol or drugs within the past 18 months were asked if they had ever received treatment for their alcohol or drug use. Respondents were asked specifically about their use of the following types of treatment services: detoxification (in a hospital; non-hospital, residential facility, or an outpatient program); residential rehabilitation (in a hospital, a residential facility which lasted longer than 30 days, or a residential facility which lasted fewer than 30 days); halfway or recovery house; outpatient or nonresidential treatment (intensive versus less intensive); outpatient methadone treatment; self-help groups; therapy from a psychiatrist, psychologist, social worker or counselor outside of a formal drug or alcohol program; talking to a religious or traditional leader, medicine person, or village elder; using alternative treatments like acupuncture, hypnosis, or vitamins or herbs; or participating in a program that used sweat lodges, talking circles or other traditional American Indian practices. We defined formal treatments as those that occurred in a structured program and were provided by licensed or credentialed professionals such as residential rehabilitation, methadone treatment, private hospital programs, and outpatient counseling. Informal or other recovery services were defined as those services individuals seek outside of structured programs including Alcoholics Anonymous (AA) or other recovery groups, speaking with elders or spiritual leaders, alternative therapies such as herbs, acupuncture, or use of traditional healers.

Results

The results section focuses on the descriptive and explanatory analyses concerning substance abuse and treatment utilization. We begin by providing descriptive information about the participants from the three tribes. The prevalence of substance abuse problems by age and gender is presented for the whole sample and then by tribe. Descriptive information

about utilization of formal and informal treatment is also provided. In order to assess the association between socio-demographic characteristics (explanatory variables) and substance abuse and treatment utilization (response variables) in a multivariate setting, Logistic Regression analyses were performed. Finally, Logistic Regressions were rerun adding interaction terms to examine whether the relationships between socio-demographic characteristics and the outcomes varied by tribe.

Results are based on combined analyses from all three participating Tribal Nations. Seven hundred and twenty-five persons completed the survey. Because the Tribal Nations requested anonymity, no identifying or descriptive information about the tribes are presented. However, some results are presented by tribe in order to examine whether problem rates are homogeneous across reservations. The data were weighted such that they represented the adult population age and gender distribution of each tribe. Forty percent of the sample was recruited from Tribe A, 25% from Tribe B, and 35% from Tribe C (Table 1). There were no significant differences in the percentage of females, the age distribution, or insurance coverage by tribes. Tribes did differ significantly on the following demographic and socioeconomic characteristics: unemployment ($X^2 = 33.98$, $df = 8$, $p < .001$), marital status ($X^2 = 16.46$, $df = 6$, $p < .01$), income ($X^2 = 75.14$, $df = 8$, $p < .001$), and educational achievement ($X^2 = 86.05$, $df = 4$, $p < .001$). Tribe C had the lowest unemployment rate and the highest educational and income level. Tribe C also had the lowest number of individuals reporting alcohol use within the past 18 months ($X^2 = 16.16$, $df = 2$, $p < .0001$).

One-third of American Indians residing on reservation had an alcohol or drug problem (Table 2). Alcohol abuse or dependence disorders were much more common than dual alcohol and drug problems or drug only problems. Males were more likely to have an alcohol only and dual alcohol and drug problem than females. Males and females were equally likely to have drug only problems. The prevalence of alcohol problems was consistent across young and middle-age groups and did not drop until after age 45. Eighty-eight percent of 46 to 55 year olds and 95.1% of individuals 56 years and older were free of substance abuse problems compared to 59.1% of 18 to 25 year olds, 64.1% of 26 to 35 year olds, and 68.5% of 36 to 45 year olds. Dual alcohol and drug disorders decreased with age from 14.5% of 18 to 25 year olds to 10.4% of 26 to 35 year olds, to 4.1% of 36 to 45 year olds. No instances of co-morbid alcohol and drug problems were found among reservation residents over the age of 45. Drug only problems were very uncommon, with generally less than 1% of the population abusing or being dependent on illicit substances in the absence of an alcohol use disorder.

Substance abuse varied significantly across tribes (see Table 3). Tribe B had the highest rates of alcohol or drug abuse problems and Tribe C the lowest. Among all tribes, alcohol only problems were the most

prevalent. Drug only problems were only reported in Tribe A (the most urban reservation). Females in Tribe C had particularly low rates of substance abuse problems. Substance abuse problems were greater among males in all tribes. Alcohol problems tended to persist through middle age for members of Tribes A and B, while the proportion of adults with substance abuse problems in Tribe C generally decreased with age. However, among those in Tribe C, the proportion of adults with dual alcohol and drug problems was consistent among 18 to 55 year olds, but decreased more substantially after age 35 for members of Tribes A and B.

Among those with a substance abuse problem, 64.5% did not receive any treatment in the past 12 months; 7.1% utilized formal treatment services only (e.g., outpatient, inpatient, detox); 13.6% used both formal and informal treatment services; while 15.2% used informal services only such as AA or Native healing (e.g., sweat lodges, medicine men) (See Table 4). Among those who used informal treatment, use of Native healing practices was more common than use of AA (27.4% vs. 14.3%, respectively). Significant differences in the types of treatment accessed were found by age ($X^2 = 20.69$, $df = 9$, $p < .01$) and income ($X^2 = 20.83$, $df = 12$, $p < .05$). Elders were least likely to receive treatment, while individuals between the ages of 18 and 25 were most likely to use formal services and those aged 26 to 35 were most likely to use informal or combined approaches to treatment.

Multivariate Logistic Regression analyses were conducted to examine the associations between socio-demographic characteristics and substance abuse problems. Variables significantly associated with substance abuse problems included gender, tribal affiliation, age, employment, income, and educational achievement. As shown in Table 5, males were 3.05 times more likely than females to have a substance abuse problem. Prevalence rates also varied by tribe with adults in Tribe A and Tribe B being 1.94 and 2.50 times more likely to have an alcohol or drug abuse disorder than adults in Tribe C. Young and middle-aged adults were more likely to have substance abuse problems than older adults: 18 to 25 year olds were 7.01 times more likely than adults over age 55 to have problems, individuals 26 to 35 years were 8.47 times more likely to have a substance abuse disorder than individuals over age 55, and adults aged 36 to 55 years were 7.06 times more likely than those over 55 to have a current substance abuse problem. Those whose employment status was "other" (e.g., homemakers, retired) were less likely to have substance abuse problems than those who were employed. A high income was protective such that those with higher household incomes were less likely to have substance abuse problems. Educational achievement was also protective: individuals who did not graduate from high school were 2.55 times more likely to have a substance abuse problem than those with more than a high school education, and individuals with a high school degree were 2.19 times more likely than those with more than a high school education to

Table 1
Sample Characteristics by Tribe (weighted) (n=725)

	Tribe A	Tribe B	Tribe C	Total
Sample size	288	180	257	725
% Female	54.3%	53.1%	51.1%	52.8%
18-25 years	27.5%	15.6%	18.0%	21.8%
26-35 years	25.7%	34.4%	26.6%	26.5%
36-55 years	19.2%	25.0%	20.4%	20.0%
56+ years	29.5%	25.0%	35.0%	31.7%
Unemployed	14.7%	16.1%	4.3%	10.1%
Employed	51.5%	58.1%	68.6%	59.5%
Other	33.7%	25.8%	27.0%	30.4%
% Married/Living Together	48.2%	56.3%	62.2%	54.8%
Separated/divorced/widowed	22.6%	18.8%	19.8%	21.2%
Single (never married)	29.1%	25.0%	18.0%	24.0%
% with Household Income <\$15,000	62.1%	54.6%	54.1%	58.0%
Private Health Insurance	27.3%	29.0%	24.3%	26.0%
Government-provided Health Insurance	69.7%	61.3%	73.1%	70.8%
No Health Insurance	3.0%	9.7%	2.7%	3.2%
% with less than a high school education	46.3%	28.1%	20.9%	34.3%
% with high school degree or equivalent	30.1%	40.6%	22.8%	27.3%
% with greater than a high school education	23.6%	31.3%	56.3%	38.4%
% screened into alcohol diagnostic model based on use within past 18 months	64.9%	68.8%	50.5%	58.6%

Note: Unemployed excludes those who are not seeking work or who are retired and disabled. Other employment includes homemakers or those retired or disabled. High school education includes a GED.

Table 2
Type of Substance Abuse Problem by Gender and Age
(n=725)

	No Substance Abuse Problem (%)	Alcohol Only (%)	Alcohol and Drug (%)	Drug Only (%)	Total Alcohol and/or Drug Problem (%)
Males	62.6	26.0	10.8	0.6	37.4
Females	82.0	14.6	2.9	0.5	18.0
18-25 yrs.	59.1	25.2	14.5	1.3	41.0
26-35 yrs.	64.1	25.0	10.4	0.5	35.9
36-45 yrs.	68.5	26.7	4.1	0.7	31.5
46-55 yrs.	88.4	11.6	0.0	0.0	11.6
56+	95.1	4.9	0.0	0.0	4.9
Total	72.9	19.8	6.7	0.6	32.5

Table 3
Type of Substance Abuse Problem by Gender and Age and Tribe (n=725)

	No Substance Abuse Problem (%)			Alcohol Only (%)			Alcohol and Drug (%)			Drug Only (%)		
	Tribe A	Tribe B	Tribe C	Tribe A	Tribe B	Tribe C	Tribe A	Tribe B	Tribe C	Tribe A	Tribe B	Tribe C
Males	54.7	46.7	72.8	28.2	40.0	22.2	15.9	13.3	5.1	1.2	0	0
Females	75.1	76.5	91.0	20.4	17.6	7.2	3.5	5.9	1.8	1.0	0	0
18-25 yrs.	50.5	50.0	74.1	27.4	33.3	20.7	20.0	16.7	5.2	2.1	0	0
26-35 yrs.	52.6	45.5	78.8	32.6	36.4	15.3	13.7	18.2	5.9	1.1	0	0
36-55 yrs.	60.6	55.6	79.1	35.2	33.3	16.4	2.8	11.1	4.5	1.4	0	0
56+	93.6	87.5	91.2	6.4	12.5	8.8	0	0	0	0	0	0
Total	65.7	58.8	82.4	24.1	29.4	14.2	9.2	11.8	3.4	1.1	0	0

Table 4
Treatment Utilization by Those with Current Substance Abuse Problems Within the Past 12 Months by Demographic Characteristic and Type of Substance Abuse Problem (n=196)

	No Treatment Services (%) (n=127)	Formal Services Only (%) (n=15)	Formal and Informal Services (%) (n=35)	Informal Services Only (%) (n=51)
Tribe A	63.8	7.9	14.2	14.2
Tribe B	58.3	8.3	0	33.3
Tribe C	66.7	5.3	14.0	14.0
Male	64.3	4.7	17.1	14.0
Female	64.7	10.3	7.6	17.6
18-25 years	68.2	15.2	6.1	10.6
26-35 years	53.6	4.3	21.7	20.3
36-55 years	71.1	2.2	11.1	15.6
56+ years	77.8	0	11.1	11.1
Employed	65.6	3.3	13.1	18.0
Other	55.0	15.0	17.5	12.5
Unemployed	70.6	11.8	11.8	5.9
Married	60.6	5.1	16.2	18.2
Divorced/separated/widowed	67.9	7.1	14.2	10.7
Single, never married	67.6	9.9	9.9	12.7
% income below \$15,000	63.3	9.2	11.5	15.3
% income above \$15,000	63.8	1.7	19.0	15.5
% less than high school degree	67.1	12.1	8.2	12.3
% with high school degree or equivalent	61.4	4.3	14.3	20.0
% with greater than a high school degree	64.8	3.7	18.5	13.0
Private Health Insurance	60.9	0	22.9	17.1
Government-provided health insurance	66.9	7.0	12.7	13.4
No health insurance	37.5	25.0	0	37.5
Total	64.1	7.1	13.6	15.2

Note: Unemployed excludes those who are not seeking work or who are retired and disabled. Other employment includes homemakers or those retired or disabled. High school education includes a GED.

Table 5
Adjusted Odds Ratios and 95% Confidence Intervals (CI):
Demographic Correlates of Substance Abuse Problems
(*n*=725)

	Odds Ratio	Lower CI	Upper CI
Male vs. female	3.05*	2.03	4.57
Tribe A vs. C	1.94*	1.26	2.99
Tribe B vs. C	2.50*	1.02	6.14
18-25 years (vs. 56+ years)	7.01*	3.40	14.48
26-35 years (vs. 56+ years)	8.47*	4.22	16.96
36-55 years (vs. 56+ years)	7.06*	3.50	14.24
Other vs. employed	0.59*	0.35	0.98
Unemployed vs. employed	0.94	0.51	1.72
Separated/divorced/widowed vs. married	1.31	0.73	2.35
Single (never married) vs. married	1.37	0.86	2.18
Income - continuous	0.85*	0.76	0.95
Less than high school education vs. greater than high school education	2.55*	1.47	4.40
High school education vs. greater than high school	2.19*	1.36	3.53

* $p < .05$

Note: Unemployed excludes those who are not seeking work or who are retired and disabled. Other employment includes homemakers or those retired or disabled. High school education includes a GED.

have an alcohol or drug problem. Interaction terms were added to determine whether these relationships varied by tribe. Tribal interactions were found for education level, marital status, and age (not shown). The odds of a divorced, separated, or widowed adult having a substance abuse problem (as compared to a married adult) was higher in Tribe C than Tribe A. The odds ratio of an individual without a high school education having a substance abuse problem (compared to an individual with more than a high school education) was greater for adults in Tribe A as compared to Tribe C. Finally, the odds of younger and middle age adults having a substance abuse problem (as compared to adults over age 55) was greater in Tribe A than in Tribe C.

The next table (Table 6) examines correlates of past year treatment utilization. Males were 2.91 times more likely than females to receive treatment. Adults in Tribe A were more likely to receive treatment than those in Tribe C. Adults aged 26 to 35 were the most likely to utilize treatment services in the past year. Interestingly, those with insurance (private or government-provided) were less likely to receive care. Employment, marital status, income, and educational achievement were not significant correlates of past year treatment utilization. Interactions between tribe and the other socio-demographic variables were not significant.

Discussion

A substantial portion of American Indians on Arizona reservations suffer from substance abuse problems, particularly alcohol abuse or dependence. Despite the high prevalence of alcohol use disorders in the population, it is important to note that a large number of American Indians are nondrinkers: 41.5% of those surveyed reported no alcohol use at all in the past 18 months. The proportion of the adult population abstaining from alcohol is much higher among American Indians than the general population (less than 20% of the adult household population nationally abstains from alcohol) (Substance Abuse and Mental Health Services Administration [SAMHSA], 2000). May (1989) notes that there are two kinds of nondrinkers - those who are lifelong abstainers and those who are former drinkers who have quit. Consistent with other studies (Leung et al., 1993), alcohol use appears to be bi-modally distributed in the community with large proportions of individuals abstaining and large proportions drinking heavily.

It has been hypothesized that economic deprivation and lack of opportunity are significant contributors to alcohol problems on reservation (Beauvais, 1998). Consistent with this hypothesis, we found that the Tribal Nations with the highest level of education and household income had the lowest levels of problem alcohol and drug use. Both education attainment and income were significantly associated with substance abuse problems even after controlling for gender, age, and tribal affiliation, although

Table 6
Adjusted Odds Ratios and 95% Confidence Intervals (CI):
Demographic Correlates of Past Year Treatment Utilization
(*n*=725)

	Odds Ratio	Lower CI	Upper CI
Male vs. female	2.91*	1.74	4.86
Tribe A vs. C	2.59*	1.47	4.58
Tribe B vs. C	2.44	0.82	7.27
18-25 years (vs. 56+ years)	3.30*	1.33	8.20
26-35 years (vs. 56+ years)	5.80*	2.56	13.14
36-55 years (vs. 56+ years)	3.92*	1.70	9.05
Other vs. employed	0.72	0.38	1.37
Unemployed vs. employed	0.49	0.22	1.10
Separated/divorced/widowed vs. married	1.41	0.70	2.84
Single (never married) vs. married	0.85	0.47	1.56
Income-continuous	0.90	0.78	1.03
Less than high school education vs. greater than high school education	0.83	0.42	1.62
High school education vs. greater than high school education	1.38	0.78	2.44
Private insurance vs. no insurance	0.18*	0.06	0.55
Government insurance vs. no insurance	0.35*	0.13	0.96

* $p < .05$

Note: Unemployed excludes those who are not seeking work or who are retired and disabled. Other employment includes homemakers or those retired or disabled. High school education included a GED.

Note: 31 individuals who were not diagnosed as needing treatment received treatment within the past 12 months.

surprisingly unemployment was not. It is possible that the way employment categories were coded disguised significant contrasts. For example, many of the people interviewed were self-employed as artisans, while others worked part-time or seasonal jobs (e.g., firefighting in the national forests during the summer when dry conditions are common). Thus, standard categorization systems for employment may not be effective for reservation populations whose work status may be in a state of flux. Poverty was rampant in this sample, with 54% reporting a household income of less than \$15,000 and an unemployment rate of 10.1%. Clearly economic vitalization and autonomy are central to maintaining a healthy lifestyle among reservation residents.

Substance abuse problems are more common among males and young to middle age adults. Concurrent with other research, our study found that high problem rates persist until about 45 years of age when rates begin to drop off (Bray et al., 1999; Leung et al., 1993; Manson et al., 1992). Rates may be lower among older adults because of high levels of alcohol-related mortality or because individuals eventually age-out of heavy or problematic drinking (Quintero, 2000). Mail and Johnson (1993) report that many men eventually quit drinking as they begin to take on responsibilities associated with being an elder, and heavy drinking females report quitting substance use around the age of 35 to 40 when they see their behavior is inconsistent with the expectations they endorse for their children.

Although males were 2 to 3 times more likely to have alcohol or drug problems than females, the proportion of females reporting substance abuse problems is much larger than the Arizona general population (18% vs. 6%) or the U.S. female population as a whole (Arizona Department of Health Services [ADHS], 1998; Kessler et al., 1994). In addition, females had rates of drug-only problems that were equivalent to males. The proportion of female problem drinkers in our study is higher than that found by Leung et al. (1993), but similar to rates found by Bray and colleagues (1999). It is difficult to make direct comparisons to other studies due to differences in methodologies and definitions of what constitutes a substance abuse problem. Pathways to alcohol abuse may differ for women: Women may be more likely to develop problem use while in relationships with substance abusing men or to turn to alcohol in an effort to relieve the negative affect associated with victimization, grief, and loss. Many American Indian women presenting for substance abuse treatment have a history of trauma including child sexual abuse and domestic violence (Brindis et al., 1995). Future research should seek to delineate the differences in substance use etiology for American Indian men and women.

Although problems with alcohol greatly outnumber problems with drugs, the proportion of adults with drug problems is still much higher than the Arizona and U.S. non-reservation household population (ADHS, 1998, Kessler et al., 1994), particularly among those who already have problems with alcohol. Whereas alcohol has been the primary drug of addiction, Mail and Johnson (1993) report a growing concern among Tribal Nations for illicit drug use and poly-drug use. Experimentation with illicit drugs appears to start earlier for American Indian youth (Beauvais & LaBoueff, 1985), and early and excessive use may greatly increase the probability of future substance abuse problems. As such, treatment and prevention providers should focus on the role of illicit drugs both in the pathways to addiction and in the treatment of concomitant disorders.

Approximately two-thirds of individuals with a substance abuse problem had not received care in the past year. Women and elders were the least likely to receive care. Responsibilities such as taking care of children may make women less available to seeking care. Women also

may be less likely to come into contact with systems that can identify, refer, or mandate substance abuse treatment such as the criminal justice or employment systems. Because substance use is less common among elders, there may be more stigma associated with seeking treatment. Attitudes toward treatment or world-views of illness and healing may also impact treatment-seeking behavior of older American Indians (Manson, 2000). The rural and isolated nature of many reservations presents special challenges for both the outreach and provision of care. Most people who received treatment used informal services whether alone or in conjunction with formal services. Use of informal services may result from poor access to formal programs as well as a desire to incorporate traditional aspects of healing and spirituality into recovery. In this study 27.4% of people with a substance abuse problem reported use of traditional healing practices including sweat lodges, traditional ceremonies, consultation with village elders, or use of medicine men. What little research there is on treatment effectiveness among American Indians suggests that culturally diverse treatments that include traditional forms of healing and use ethnically matched counselors may increase treatment success (May & Moran, 1995; Weibel-Orlando, 1989). The use of AA was less frequent: 14.3% of those with a substance abuse problem reported use of this service. American Indians on reservation may assume that AA is incompatible with their belief system, although use seems to be increasing as the traditional Twelve Step philosophy is being expanded to include tribal values and beliefs (Abbott, 1998; CSAT, 1999; Womack, 1996).

Private insurance coverage was low in the population; however, insurance coverage did not facilitate access to treatment in this study. Many insurance plans provide inadequate coverage for substance abuse treatment. Furthermore, even if substance abuse treatment is covered under insurance, access or availability may be limited. More health services research is needed to understand the structural barriers to substance abuse treatment among American Indians including the association between payment systems and access to health care. Moreover, given the popularity of traditional healing among this population, future research should explore rationales for selecting types of treatment as well as the effectiveness of traditional healing.

It is important to recognize that there is a great deal of diversity in the cultural, geographical, and economic characteristics of Tribal Nations (Weisner, Weibel-Orlando, & Long, 1984). Our study did find differences in substance use and treatment seeking behavior by tribe. Substance use may be affected by a number of contextual or cultural characteristics including the historical context of alcohol introduction, tribal history of political and economic oppression, migration, adherence to traditional culture, cultural perspectives on substance use (e.g., ceremonial use, vision quests) as well as community attitudes, norms, and policies regarding alcohol

(Beauvais, 1998; Weisner, Weibel-Orlando, & Long, 1984). As such, researchers need to take into account the macro level characteristics associated with substance use across different reservations.

Several limitations to this study should be noted. Data were collected from a representative household sample of three reservations in the State of Arizona. The resultant sample had a higher proportion of female participants than would be expected by chance (results were weighted to the population to correct for this), thus we cannot be certain that the individuals within households were randomly selected as intended. Participation of the adult over the age of 18 with the most recent birthday was requested, but it is possible that whoever answered the door overrode this request and selected the person with the lowest substance use to participate. Similarly, attitudes toward research or service utilization could have influenced self-selection for participation. The sample consists of American Indians from only three reservations and these reservations were selected due to high county-level indicators of alcohol-related mortality and morbidity. Because there is a great deal of diversity among Tribal Nations, we cannot generalize findings from these three Nations to all American Indians residing on reservation in Arizona or the United States. Fear of lack of confidentiality or social desirability may have motivated some respondents to underestimate their substance use; thus, these data are limited by use of a single reporter. Validation of substance use by multiple reporters or methods may strengthen future research in this area. Nevertheless, the rates of substance misuse found in this population are consistent with those of other epidemiologic studies of American Indians (Bray et al., 1999; Kinzie et al., 1992). The Diagnostic Interview Schedule has been used worldwide and can be used effectively with American Indians (Manson, Walker, & Kivlahan, 1987); however, further efforts to continue to assess the cross-ethnic and cross-language equivalence of this and other diagnostic measures are needed. In our study, 72 individuals conducted their interview in their Native language or in a mix of English and their Native language. Although key terms were translated and information about the need for standardization in translation was discussed in training, we cannot assure standardization across all interviews. Finally, this study did not include off-reservation American Indians and more research is needed to compare alcohol and drug use between those residing on and off-reservation.

Conclusion

Many American Indians on reservation abstain from alcohol use and many others have problems resulting from excessive and out-of-control use. Given this extreme distribution of drinking patterns, more research is needed to understand more moderate or controlled patterns of drinking. Dramatic differences exist within and between Tribal Nations and across

people. Thus, a deeper understanding of the interpersonal and contextual influences on excessive substance use is crucial. Rather than focusing solely on estimating psychopathology in American Indian communities, research should focus on understanding issues of resilience such as identifying factors associated with resistance to substance use initiation or successful recovery. Understanding the correlates and predictors of substance use and abuse among American Indians is important for the development of empirically grounded and culturally sensitive prevention and treatment models (Beauvais, 1992b; May & Moran, 1995; Stubben, 1997). Only through comprehensive, community-driven, and culturally sensitive efforts can the myriad problems associated with substance abuse in American Indian communities be combated.

Mindy Herman-Stahl, Ph.D.
 Research Psychologist
 RTI International
 3040 Cornwallis Road
 P.O. Box 12194
 Research Triangle Park, NC 27709-2194

References

- Abbott, P. J. (1998). Traditional and western healing practices for alcoholism in American Indian and Alaska Natives. *Substance Use and Misuse, 33*, 2605-2604.
- American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th edition). Washington, DC: Author.
- Arizona Department of Health Services (ADHS). (1998). *Substance abuse in Arizona* (Contract No. 270-94-0026). Phoenix, AZ: Author.
- Beauregard, K., Cunningham, P., & Cornelius, L. (1991). *National Medical Expenditure Survey Research Findings 9* (AHCPR Pub. No. 91-0028). Rockville, MD: Agency for Health Care and Policy Research.
- Beauvais, F. (1998). American Indians and alcohol. *Alcohol Health and Research World, 22*, 253-259.
- Beauvais, F. (1992a). Comparison of drug use rates for reservation Indian, non-reservation Indian, and Anglo youth. *American Indian and Alaska Native Mental Health Research, 5*, 14-31.
- Beauvais, F. (1992b). An integrated model for prevention and treatment of drug abuse among American Indian youth. *Journal of Addictive Diseases, 11*, 63-80.

- Beauvais, F., & LaBoueff, S. (1985). Drug and alcohol abuse intervention in American Indian communities. *The International Journal of the Addictions, 20*, 139-171.
- Beauvais, F., Oetting, E. R., & Edwards, R. (1985). Trends in drug use of Indian adolescents living on reservations 1975-1983. *American Journal of Drug and Alcohol Abuse, 20*, 139-170.
- Bray, R. M., Dalberth, B. T., Herman-Stahl, M., Walker, J. A., Sanchez, R. P. (1999). *Substance use and need for treatment: Findings from the 1996-97 South Dakota Native American survey*. Research Triangle Park, NC: Research Triangle Institute.
- Brindis, C., Berkowitz, G., Peterson, S., Broadnax, Y., Clayson, Z., Gandhi, S., Handley, M., & Tung, P. (1995). *Evaluating the effectiveness of alcohol and substance abuse services for American Indian/Alaska Native women. Phase 2 final report*. (DHHS Contract Number 282-92-0048). University of California at San Francisco: Center for Reproductive Health Policy Research, Institute for Health Policy Studies.
- Center for Substance Abuse Treatment. (1999). *Cultural issues in substance abuse treatment*. U. S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration (DHHS Publication No. SMA 99-3278). Rockville, MD: Author.
- Indian Health Service. (1996). *Trends in Indian health*. U. S. Department of Health and Human Services, Indian Health Services, Office of Planning, Evaluation, and Legislation, Division of Program Statistics. Author.
- Kessler, R. C., McGonagle, K. A., Zhao, S., Nelson, C. B., Hughes, M., Eshleman, S., Wittchen, H., & Kendler, K. S. (1994). Lifetime and 12-month prevalence of DSM III-R psychiatric disorders in the United States: Results from the National Co-morbidity Study. *Archives of General Psychiatry, 51*, 8-19.
- Kinzie, J. D., Leung, P. K., Boehnlein, J., Matsunaga, D., Johnson, R., Manson, S., Shore, J. H., Heinz, J., & Williams, M. (1992). Psychiatric epidemiology of an Indian village: A 19-year replication study. *Journal of Nervous and Mental Disease, 180*, 33-39.
- Leung, P. K., Kinzie, J. D., Boehnlein, J. K., & Shore, J. H. (1993). A prospective study of the natural course of alcoholism in a Native American village. *Journal of Studies on Alcohol, 54*, 733-738.
- Mail, P. D., & Johnson, S. (1993). Boozing, sniffing, and toking: An overview of the past, present, and future of substance use by American Indians. *American Indian and Alaska Native Mental Health Research, 5*, 1-33.
- Manson, S. M. (2000). Mental health services for American Indians and Alaska Natives: Need, use, and barriers to effective care. *Canadian Journal of Psychiatry, 45*, 617-626.

- Manson, S. M., Shore, J. H., Baron, A. E., Ackerson, L., & Neligh, G. (1992). Alcohol abuse and dependence among American Indians. In J. E. Helzer & G. J. Canino (Eds.), *Alcoholism in North American, Europe, and Asia* (pp. 113-130). New York: Oxford University Press.
- Manson, S. M., Walker, R. D., & Kivlahan, D. R. (1987). Psychiatric assessment and treatment of American Indians and Alaska Natives. *Hospital and Community Psychiatry, 38*, 165-173.
- May, P. A. (1989). Alcohol abuse and alcoholism among American Indians: An overview. In T. D. Watts & R. Wright (Eds.), *Alcoholism in minority populations* (pp. 95-119). Springfield, IL: Charles Thomas Publisher.
- May, P. A. (1994). The epidemiology of alcohol abuse among American Indians: The mythical and the real properties. *American Indian Culture and Research Journal, 18*, 121-143.
- May, P. A., & Moran, J. (1995). Prevention of alcohol misuse: A review of health promotion efforts among American Indians. *American Journal of Health Promotion, 9*, 288-299.
- McKenzie, D. (1994). Dialogue on aboriginal substance use. In D. McKenzie (Ed.), *Aboriginal Substance use research issues* (pp. 36-52). Ottawa: Canadian Center for Substance Abuse.
- National Institute on Drug Abuse. (1995). *Drug use among racial/ethnic minorities*. U.S. Department of Health and Human Services (NIH publication no. 95-3888). Rockville, MD: Author.
- Nelson, S. H., McCoy, G. F., Stetter, M., & Vanderwagen, W. C. (1992). An overview of mental health services for American Indians and Alaska Natives in the 1990s. *Hospital and Community Psychiatry, 43*, 257-261.
- Noren, J., Kindig, D., & Sprenger, A. (1998). Challenges to Native American health care. *Public Health Reports, 113*, 22-33.
- Quintero, G. (2000). "The lizard in the green bottle": "Aging out" of problem drinking among Navajo men. *Social Science Medicine, 51*, 1031-1045.
- Regier, D. A., Farmer, M. E., Rae, D. S., Locke, B. Z., Keith, S. J., Judd, L. L., & Goodwin, F. K. (1988). Comorbidity of mental disorders with alcohol and other drug abuse: Results from the Epidemiologic Catchment Area (ECA) study. *Journal of the American Medical Association, 19*, 2511-2517.
- Robbins, L. N., Cottler, L. B., & Babor, T. (1990). *The Diagnostic Interview Schedule - Substance Abuse Module (DIS-SAM)*. St. Louis: Department of Psychiatry, Washington University School of Medicine.
- Roy, C., Choudhuri, A., & Irvine, D. (1970). The prevalence of mental disorders among Saskatchewan Indians. *Journal of Cross-Cultural Psychology, 1*, 384-392.
- Sampath, B. M. (1974). Prevalence of psychiatric disorders in a southern Baffin Island Eskimo settlement. *Canadian Psychiatric Association Journal, 19*, 303-367.

- Substance Abuse and Mental Health Services Administration, SAMHSA. (2000). *National household survey on drug abuse: Main findings 1998*. Department of Health and Human Services. Rockville, MD: Author.
- Saremi, A., Hanson, R. L., Williams, D. E., Roumain, J., Robin, R., Long, J. C., Goldman, D., & Knowler, W. C. (2001). Validity of the CAGE questionnaire in an American Indian population. *Journal of Alcohol Studies, 62*, 294-300.
- Shore, J. H., Kinzie, J. D., Hampson, D., & Pattison, M. (1973). Psychiatric epidemiology of an Indian village. *Psychiatry, 36*, 70-81.
- Stubben, J. (1997). Culturally competent substance abuse prevention research among rural Native American communities. In E. B. Robertson, Z. Sloboda, G. Boyd, L. Beatty, & N. Kozel (Eds.), *Rural substance abuse: State of knowledge and issues* (pp. 450-483). Rockville, MD: NIDA Research Monograph 168 (NIH Publication No. 97-4177).
- Weibel-Orlando, J. (1989). Treatment and prevention of Native American alcoholism. In T. Watts & R. Wright (Eds.), *Alcoholism in minority populations* (pp. 121-139). Springfield, IL: Charles Thomas Publishers.
- Weisner, T. S., Weibel-Orlando, J. C., & Long, J. (1984). "Serious drinking," "White man's drinking" and "teetotaling": Drinking levels and styles in an Urban American Indian population. *Journal of Studies on Alcohol, 45*, 237-250.
- Womack, M. L. (1996). *The Indianization of Alcoholics Anonymous*. Monograph of the Native American Research and Training Center, University of Arizona. Tucson, Arizona.

Author's Notes

Funding for this project was made possible through the Behavioral Health Services, Arizona Department of Health Services by contract #270-94-0026 under the States System Development Program administered by the Division of State Programs, Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services Administration. The Human Subjects Committee (Institutional Review Board) of the University of Arizona authorized the approval of this project through the expedited review procedure, with the condition(s) that subjects' anonymity be maintained. We gratefully acknowledge the assistance of Christina Dye, Arizona Department of Health Services; Steven Chang, University of Arizona; the Tribal Councils and Tribal Health Departments and members of the planning committee who supported and guided this research, specifically Teresa Wall, Veronica Pastrano, Linda Havatone, Leon Nuvayestewa, Georgia Masayesva, Ph.D., Karen Honanie, Taylor Satala, and Herman Honanie. We are particularly indebted to all of the survey interviewers for their hard work and commitment, and to the respondents for their kind participation. We also thank the anonymous reviewers for their insightful comments.

Requests for reprints should be sent to Mindy Herman-Stahl (mindy@rti.org), Center for Interdisciplinary Substance Abuse Research, 3040 Cornwallis Drive, P.O. Box 12194, Research Triangle Park, NC 27709-2194.

Footnote

¹Members of Federally recognized tribes and their descendants are eligible for health care services provided by IHS, an arm of the U.S. Public Health Service. However, due to fiscal constraints, health care services must sometimes be rationed. Thus, eligibility does not necessarily guarantee receipt of service.