

Healthy Nations Evaluation

Drinking Behavior, Norms, and Opinions in Two Healthy Nations Sites with Two Matched Controls

by

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Introduction

The Epidemiologic characteristics of drinking among American Indian adults has not been well studied and not monitored longitudinally to any extent (May, 1996). Trends in substance abuse have been monitored for Indian youth over the past two decades (Beauvais, 1998), but there is less variability in drinking among youth than among adults by various age groups and by tribal culture or community. The few studies of adult drinking among Indians have reported the following: that more men than women drink; that drinking in ages 40+ is reduced, and many males and females become abstainers; that overall about 70 percent of males and 60 percent of females among Plains tribes drink; that alcohol is perceived as a dangerous commodity, and therefore most Indians have conservative values about its use; but behavior often does not live up to these conservative values, and infrequent high-risk, severe, binge drinking is far too common among a subset of people in many reservation communities; and that binge drinking and some chronic drinking take a toll in terms of morbidity, mortality, and social consequences (May, 1996; May and Gossage, 2001).

In this chapter an attempt is made to gauge the impact of the Healthy Nations Program at two of the program sites by comparing alcohol- and drug-abuse variables to two carefully matched control reservations. Some conclusions might be made about the impact of Healthy Nations activities from this comparison.

Methods

The data in this chapter were collected under the activities of two grants (R01 AA09440 and R01 AA11685) from the National Institute on Alcohol Abuse and Alcoholism (NIAAA). As part of prevention and epidemiologic research on fetal alcohol syndrome (FAS), the data originate from a self-report survey of adults (16 years and older) in each of four communities of the Northern Plains of Montana, South Dakota, and North Dakota. The reprocessing of the data and the analysis for this part of the Healthy Nations evaluation study was funded by the Robert Wood Johnson Foundation.

All four communities in the analysis were of Plains or Plains/Plateau culture, two of which participated in the Healthy Nations initiative the entire six years of its existence and two which did not (control communities). One of the Healthy Nations communities was substantially more acculturated than the other, and one control community was also more acculturated than the other control. This makes the matching of the Healthy Nations communities with the controls quite good, as contained in each comparison group is one relatively traditional and one relatively acculturated group. As presented in Table 1, there were few differences in the demographic variables of the Healthy Nations and the control groups once the data were aggregated. This makes the comparison of drinking and drug-use variables more valid and less likely to be influenced by factors exogenous to social movements/public health initiatives such as Healthy Nations.

The first year that tribes had the legal authority to legalize alcohol on reservations was 1953. All four of the reservations have had a current and

historical pattern of legalized alcohol on reservation. The two Healthy Nations sites legalized alcohol on their reservations in 1953 and 1960, and the two controls legalized in 1955 and 1981 (May, 1977; Lopez, 2002), although given the nature of land ownership and proximity of non-Indian towns to the major Indian populations on the later reservation, legal access to alcohol has been relatively easy since 1953.

The sample is from a self-report survey of 1,519 individuals in the four communities collected between 1997 and 2000. It is the aggregate of four simple random samples from the tribal roles of the four communities and an extensive, 28-page questionnaire. Respondents had the option of filling out the questionnaire on their own or by interview in either English or their traditional language. Respondents received \$10 for their time and effort. Quality control was ensured by University of New Mexico-trained and -employed staff at each site and staff based in Albuquerque. The questionnaire contained items on the quantity, frequency, and variability of drinking and drug use. It also asked about drinking contexts, norms of drinking, knowledge, attitudes, and beliefs about drinking and alcohol policy, and the consequences of drinking and drug use. The final age range in the sample was 16 to 92 years, with a mean age of 38.8 and a median of 37. The sample size at each site ($n = 380$) was selected to ensure less than 5 percent error, and in most sites it is estimated at 4 percent given the small population. However, the error estimates of the individual Healthy Nations sample and the control sample as presented here is 3 percent, and the overall sample combined is less than ± 2 percent.

All variables in the sample were scrutinized for relevance to the Healthy Nations program. Once the Healthy Nations comparison files were established through the reprocessing of these data, a second examination of relevant variables was again pursued. As reported in the following tables, those variables which address Healthy Nations program goals, whether with significant differences and without statistical significance, are substantial in number. Some indicate areas of encouragement, while a few are discouraging.

It would have been ideal to have had a pretest/posttest design. A survey such as this could have been administered at baseline and repeated in the sixth year of the Healthy Nations program. But that research design was not pursued by the program. However, the timeframe covered by the survey (1997-2000) on these reservations provides a snapshot of differences that might be attributed to the programs, activities, and paradigm put forth by Healthy Nations programs at these two sites.

Results

Analyses were completed for comparing data from respondents of the Healthy Nations (n = 747) and control sites (n = 774) on various demographic, cultural, substance use, and opinion variables. Demographic variables are presented in Table 1 and show that the two groups of respondents were virtually identical in the distribution of males and females (43% and 56%, respectively). Respondents within the Healthy Nations sites were 1.5 years older than respondents within the control sites (40 years of age vs. 38); this difference was near statistical significance ($t = 1.93$, $p = 0.054$). As a group the Healthy Nations

respondents had achieved substantially more education ($X^2 = 6.84, p. = 0.033$). The groups were similar in marital status with 48 percent of both groups reporting they were married. The Healthy Nations group held jobs with higher status as categorized with the Hollingshead Occupational Codes with 16 percent holding professional or administrative jobs vs. 15 percent for the control group. The Healthy Nations group also included more individuals who were skilled in various manual jobs (25% vs. 21%). The difference between the two groups with respect to types of occupations was statistically significant ($X^2 = 22.26, p. = 0.004$). One would expect then that the mean family income among Health Nations' families would be higher, and this was the case with 24 percent having incomes greater than \$30,000 as compared to 21 percent for the control sites, but this difference was not significant. One measure of social integration (Durkheim, 1951; May, 1982) is presented in Table 1 and shows that 67 percent of both groups had resided off their reservation for one year or more. Both groups provided information about their television-watching habits. The data revealed an average of three hours per day and seventeen hours each week were spent watching television; there was no significant difference in the amount of television viewed. Both groups are well below the National mean of 5 hours per day. This information has potential value in identifying favorite television shows ("Seinfeld," "E.R.," assorted news programs, and the "Wheel of Fortune") and for targeting the viewers of those favorite shows with public service announcements in which to include universal messages about the prevention of alcohol-related problems such as driving while intoxicated (DWI) or Fetal Alcohol Syndrome (FAS).

Table 1. Characteristics of the Two Samples *

Variable	Healthy Nations Sites (n = 747)	Control Sites (n = 774)
Sex (%)		
Male	43.4	43.8
Female	56.6	56.2
$X^2 = 0.03, p. = 0.867$		
Age (mean)		
$t = 1.93, p. = 0.054$	39.6	38.1
Education (%)		
<HS / GED	23.5	26.0
HS or GED	23.6	27.7
Vocational school +	52.9	46.3
$X^2 = 6.84, 2 \text{ df}, p. = 0.033$		
Marital Status (%)		
Single (never married)	30.6	31.1
Married	47.7	48.2
Separated/Divorced/Widowed	21.7	20.7
$X^2 = 0.23, 2 \text{ df}, p. = 0.893$		
Employment Status (%)		
Employed	54.4	58.1
$X^2 = 2.15, p. = 0.143$		
Occupations (Hollingshead Occupational Codes)(%)		
Professional or administrative jobs	16.0	14.9
Skilled manual	24.9	20.9
All others	59.1	64.2
$X^2 = 22.26, 8 \text{ df}, p. = 0.004$		
Family Incomes (%)		
<\$20,000	59.8	63.1
\$20,000 - \$29,999	16.3	16.2
\$30,000 or more	23.9	20.8
$X^2 = 2.21, 2 \text{ df}, p. = 0.331$		
Residence / social integration (%)		
Lived off reservation 1 year or more	67.3	66.9
$X^2 = 0.03, p. = 0.865$		

Table 1. Characteristics of the Two Samples * (continued)

Variable	Healthy Nations Sites	Control Sites
Television Watching Habits		
Hours per day (mean) <i>t</i> = 0.25, <i>p.</i> = 0.799	2.9	2.9
Hours per week (mean) <i>t</i> = 0.90, <i>p.</i> = 0.369	16.6	17.3
Favorite shows (top 3)	Seinfeld news E.R.	news Seinfeld Wheel of Fortune

* All respondents

Five measures of culture are contained in Table 2. The first is a self-assessment of how closely one holds to his or her cultural ties or adopts the habits and behaviors of the dominant society. The data revealed that respondents within the control sites identified more strongly with their Indian culture than with the White world (34% vs. 24%) ($X^2 = 33.72, p. = 0.000$). However, respondents within the Healthy Nations group were substantially more active in their traditional ceremonies (59% vs. 53%) ($X^2 = 13.62, p. = 0.001$). The difference between the two groups was more striking on a third measure. Respondents from the Healthy Nations sites were much more likely to want his or her child to have a traditional name (74 percent of Healthy Nations' respondents vs. 59 percent for control respondents, $X^2 = 32.62, p. = 0.000$). The two groups were virtually even in their use of traditional treatments and teas weekly or at other times. Lastly, respondents were presented with a long list of events and

ceremonies in which they may have participated (including daily prayers to sweat lodge ceremonies to give-aways). Respondents indicated by their answers that they were actively involved in many of those activities and ceremonies. There was no significant difference between the two groups on this variable.

Table 2. Cultural Measures *

Variable	Healthy Nations Sites	Control Sites
Biculturalism (%)		
Indian only	3.8	9.7
Mainly Indian	20.5	24.4
Bicultural	42.7	42.0
Mainly White	30.6	22.9
White only	2.4	1.1
$X^2 = 33.72, 4 \text{ df}, p. = 0.000$		
Degree of involvement in traditional ceremonies (%)		
Somewhat active	46.6	45.4
Very active	12.2	7.1
$X^2 = 13.62, 2 \text{ df}, p. = 0.001$		
As a parent, respondent wants traditional name for child (%)		
	73.7	59.0
$X^2 = 32.62, p. = 0.000$		
Use traditional treatments and teas (%)		
Weekly	2.4	1.4
Other times	38.9	36.1
$X^2 = 1.36, p. = 0.243$		
Participation in traditional prayers and ceremonies (%)		
(Respondents can select more than one ceremony)	220.6	243.2

* All respondents

A primary focus of the community surveys was to determine alcohol consumption behaviors to establish norms for each community. Respondents were asked to provide information about their personal consumption of alcohol within the 7 days, 30 days, and 12 months preceding their interview. Among those respondents who had consumed alcohol at some time in their lifetime, 77 to 80 percent of the men and 69 to 70 percent of the women had consumed one or more drinks within the past year; these individuals are called “current drinkers” (see Table 3). There were no significant differences between Healthy Nations and control communities on this variable. Among the current drinkers, the men on average had been “high” or drunk 28 to 29 times in the past year. The range for women was 14 to 6 times (see Table 3). The men were fairly even in the percentage of those who had consumed alcohol within the 30 days preceding their interview (76-78%). However, among the women, there was a statistically significant difference; only 56 percent of the control site women had consumed alcohol in the past 30 days as compared to 68 percent residing in the Healthy Nation sites ($X^2 = 7.86, p. = 0.005$). Data showed that men within the control sites had 3.3 heavy drinking days vs. 2.7 for men with the Healthy Nations group; but these differences were not significant, nor was there a difference for women as both groups reported 1.8 heavy drinking days within the past 30 days. In line with these data, men in the control group consumed more standard drinks of alcohol on the days they drank (7.5 vs. 6.8 drinks), and there was a modest difference among the women on this measure with the woman in the Healthy Nations group

consuming 5 drinks on the days in which they drank alcohol as compared to 4 drinks for the women in the control group. Neither difference was significant.

Binge drinking (consuming five or more drinks per occasion) has been identified in many studies as being a cause and correlate with alcohol-related injuries, motor vehicle crashes (May, 1996; Robin, et al., 1998), and FAS (May, et al., 2000). On this variable the data revealed a statistically significant difference for men and women. Men within the control group had four binge drinking days in the past 30 days as compared to three for men in the Healthy Nations group ($t = 2.71, p. = 0.007$). And women within the control site reported two binge drinking days vs. one for women in the Health Nations group ($t = 2.13, p. = 0.034$). Almost identical percentages of men and women consumed alcohol in the seven days preceding their interview, but there was a substantial difference among the number of drinks consumed by men during that time period. Men in the control group consumed an average of 32 drinks whereas men in the Healthy Nations group consumed 18 drinks ($t = 2.23, p. = 0.026$).

Table 3. Alcohol Consumption Measures

Variable	Healthy Nations Sites	Control Sites
Drank in last year (%) *		
Male	76.7	79.9
$X^2 = 0.95, p. = 0.330$		
Female	69.7	68.9
$X^2 = 0.07, p. = 0.796$		

Times “high” or drunk in last year (mean) **

Table 3. Alcohol Consumption Measures (continued)

Variable	Healthy Nations Sites	Control Sites
Male t = 0.24, p. = 0.810	29.3	28.0
Female t = 0.54, p. = 0.587	15.8	14.0
Drank in past 30 days (%) **		
Male X ² = 0.27, p. = 0.604	78.3	76.4
Female X ² = 7.86, p. = 0.005	67.6	56.0
Number of heavy drinking days in past 30 days (mean) **		
Male t = 1.15, p. = 0.253	2.7	3.3
Female t = 0.22, p. = 0.830	1.8	1.8
Number of drinks consumed per day when drinking in past 30 days (mean) **		
Male t = 1.08, p. = 0.280	6.8	7.5
Female t = 0.80, p. = 0.425	4.5	4.2
Days binged (5+ drinks per occasion) in past 30 days (mean) **		
Male t = 2.71, p. = 0.007	2.8	4.1
Female t = 2.13, p. = 0.034	1.3	1.9
Drank in past 7 days (%) **		
Male X ² = 0.01, p. = 0.906	62.1	62.6
Female X ² = 0.46, p. = 0.496	42.4	39.6

Table 3. Alcohol Consumption Measures (continued)

Variable	Healthy Nations Sites	Control Sites
Number of drinks consumed in past 7 days (mean) **		
Male t = 2.23, p. = 0.026	18.0	32.3
Female t = 0.43, p. = 0.666	12.9	11.9

* Include respondents who have consumed alcohol at some time in their lifetime.

** Current drinkers; respondents who have consumed one or more drinks of alcohol in past 12 months.

Many problems can occur when men and women abuse alcohol; several are included in Table 4. The data reveal that respondents in the control group are more likely to drive while intoxicated (51% vs. 42%, $X^2 = 7.00$, $p. = 0.008$), drink alone (13% vs. 10%), and experience blackouts (23% vs. 18%, $X^2 = 4.14$, $p. = 0.042$). On four additional measures there is little difference between the two groups: whether respondents feel they have had major problems with alcohol, percent who have sought help in treatment, success of that treatment, and stopping and restarting drinking.

Table 4. Problems with Alcohol

Variable	Healthy Nations Sites	Control Sites
When drinking, does respondent ever (%) **		
Drive while Intoxicated $X^2 = 7.00, p. = 0.008$	42.3	50.5
Drink alone $X^2 = 2.94, p. = 0.087$	9.8	13.2
Black out $X^2 = 4.14, p. = 0.042$	17.7	22.8
Respondent has had major problem with alcohol (%) *		
$X^2 = 1.34, p. = 0.246$	30.6	27.8
Been in treatment (%) *		
$X^2 = 0.73, p. = 0.391$	24.9	23.0
Was any type of treatment helpful (%) *		
Yes $X^2 = 0.01, p. = 0.910$	40.5	41.0
In past, restarted drinking again after stopping (%) *		
No	40.3	38.9
Yes, once	23.0	21.8
Yes, more than once $X^2 = 0.80, 2df, p. = 0.669$	36.7	39.3

* Include respondents who have consumed alcohol at sometime in their lifetime

** Current drinkers

Other substances of choice are reported in Table 5. A higher percentage of control-group respondents smoke cigarettes weekly or more often (57% vs. 50%; $X^2 = 12.46, p. = 0.014$). And it would appear that the difference in the smoking of cigarettes is accounted for in the use of smokeless tobacco where more respondents in the Healthy Nations group use smokeless tobacco weekly or more often (12% vs. 5%; $X^2 = 37.10, p. = 0.000$). Use of marijuana, “speed,”

and cocaine is similar and not significant for the two groups and ranges from a high of 7 percent to a low of 3 percent.

Table 5. Other Drug Use

Variable	Healthy Nations Sites	Control Sites
In past 12 months, used weekly or more often (%)*		
Cigarettes $X^2 = 12.46, 4 \text{ df}, p. = 0.014$	49.7	56.5
Smokeless tobacco $X^2 = 37.10, 4 \text{ df}, p. = 0.000$	12.1	5.3
Marijuana $X^2 = 5.96, 4 \text{ df}, p. = 0.202$	6.4	6.8
Used in last year (%) *		
“Speed” $X^2 = 0.00, p. = 0.948$	7.1	7.0
Cocaine $X^2 = 0.31, p. = 0.578$	2.9	3.4

* All respondents

To assist tribal councils and public health officials in identifying and targeting health and social problems within their communities, respondents were asked to give their opinion as to the seriousness of seven problems. On the first five categories (FAS, cirrhosis, suicide and suicide attempts, family violence, and sexual abuse), more respondents within the Healthy Nations group rated these problems as very or extremely serious. The differences in opinions for cirrhosis and suicide and suicide attempts were statistically significant ($X^2 = 15.01, p. = 0.000$ and $X^2 = 6.42, p. = 0.040$, respectively). On the matter of how easy it was for an individual under the age of 21 to buy alcohol, more respondents within the control group believed the problem was very or extremely serious ($X^2 = 15.33, p.$

= 0.000). Both groups were asked for their opinion on whether the loss of Indian culture contributes to alcohol and drug problems. On this measure, a higher percentage of respondents in the Healthy Nations group (71%) were in agreement when compared to the control group (65%) ($X^2 = 5.59, p. = 0.018$) (see Table 6).

Table 6. Opinions on Alcohol-related Health and Social Problems

Variable	Healthy Nations Sites	Control Sites
Problem is very or extremely serious (%)*		
FAS $X^2 = 3.70, 2 \text{ df}, p. = 0.157$	77.1	73.7
Cirrhosis $X^2 = 15.01, 2 \text{ df}, p. = 0.000$	81.9	75.8
Suicide and suicide attempts $X^2 = 6.42, 2 \text{ df}, p. = 0.040$	72.1	66.0
Family violence $X^2 = 0.92, 2 \text{ df}, p. = 0.632$	81.2	80.0
Sexual abuse $X^2 = 2.80, 2 \text{ df}, p. = 0.246$	75.2	71.4
Easy to buy alcohol underage $X^2 = 15.33, 2 \text{ df}, p. = 0.000$	71.3	78.7
Loss of Indian culture contributes to alcohol and drug problems (%) *		
Yes $X^2 = 5.59, p. = 0.018$	70.5	64.8

* All respondents

Complementing the data presented earlier on the prevalence of drinking within 7, 30 days, and last year, the respondents gave their opinion on the number of drinks it would take for the average man and woman to get drunk; these data are presented in Table 7. The data suggest a modestly higher tolerance for both men and women in the control group. For men, respondents

within the Healthy Nations group believed that a man would become drunk after consuming 7.3 drinks. That compares to 8.2 drinks for the control group ($t = 3.19$, $p. = 0.001$). Similarly, for men, respondents within the Healthy Nations group believed that a woman would become drunk after consuming 5.5 drinks. That compares to 5.9 drinks for the control group ($t = 1.99$, $p. = 0.047$).

Table 7. Norms of Heavy Drinking

Variable	Healthy Nations Sites	Control Sites
Number of drinks for a male to get drunk *		
Mean	7.3	8.2
t = 3.19, p. = 0.001		
Number of drinks for a female to get drunk *		
Mean	5.5	5.9
t = 1.99, p. = 0.047		

* All respondents

A final group of questions explored some knowledge, attitudes, and beliefs about FAS. As shown in Table 8, respondents in the Healthy Nations group were more likely to have been informed about the potential harm that could occur to the fetus if a woman consumed alcohol during her pregnancy. Modestly higher percentages of respondents in the Healthy Nations group learned of that linkage from doctors or healthcare providers, traditional healers, and grandparents. For traditional healers the difference was statistically significant ($\chi^2 = 10.18$, $p. = 0.006$). Finally, a very high percentage of both groups had heard of fetal alcohol syndrome (92% and 89%).

Table 8. Knowledge, Attitudes, and Beliefs about Fetal Alcohol Syndrome

Variable	Healthy Nations Sites	Control Sites
Informed about the effects of drinking alcohol during pregnancy via (%) *		
Doctor or healthcare provider $X^2 = 1.77, 2 \text{ df}, p. = 0.414$	42.2	39.9
Traditional healer $X^2 = 10.18, 2 \text{ df}, p. = 0.006$	14.5	11.0
Grandparents $X^2 = 2.96, 2 \text{ df}, p. = 0.227$	30.0	26.4
Ever heard about Fetal Alcohol Syndrome or FAS (%) *		
Yes $X^2 = 2.07, 2 \text{ df}, p. = 0.355$	91.6	89.4

* All respondents

Discussion

This comparison of two Healthy Nations sites with two matched control sites is theoretically a very good match. In the Healthy Nations data, one reservation is a Plains-Plateau culture with relatively high levels of acculturation, and one reservation is a more isolated and traditional Plains. The control groups are virtually identical in composition—one Plains group is acculturated; one quite traditional. Among the demographic variables, there were no major differences in the comparison groups except for slightly higher educational and occupation levels on the Healthy Nations reservations. The groups did not differ significantly by sex, education, employment/unemployment status, income, residence off-reservation, or television-watching habits. Age approached significance, with the Healthy Nations site respondents 1.5 years older than controls.

With the general equality of the comparison groups in mind, the Healthy Nations reservation respondents were more likely to report bicultural identity, yet on most measures were more active participants in traditional ceremonies and practices. Bicultural identity is reported in the literature as a protective factor against substance abuse. Did Healthy Nations foster an increased appreciation for biculturalism and for Indian ceremonies? Did Healthy Nations programs provide a greater opportunity to participate?

On alcohol consumption variables, there were limited differences, but those that exist may be very important. There was no difference in the two groups for either males or females on the following variables: the percentage who drank last year; the number of times drunk last year; the number of heavy drinking days last month, the average number of drinks on each drinking day, or percentage who drank last week. However, a higher percentage of Healthy Nations females drank last month, but they were less likely than controls to have binged. Healthy Nations males were also very significantly less likely to have binged last month and drank almost half as many drinks (usually beer) last week compared to control males. So it appears that while frequency of drinking may not have been affected by Healthy Nations, the quantity consumed per occasion was affected for males and somewhat less for females; yet binge drinking measures were significantly lower for both males and females of the Healthy Nations sites.

There are no differences in treatment experience between Healthy Nations sites and the controls, but the Healthy Nations sites report significantly

lower rates of DWI and fewer blackout episodes. Similarly, other drug use (e.g., marijuana, speed, and cocaine) does not differ across sites; cigarette use, however, is significantly lower among the Healthy Nations sites. Smokeless tobacco use is higher at Healthy Nations sites.

Healthy Nations sites have more conservative opinions about alcohol use as they see cirrhosis, suicide, and underage purchase of alcohol as greater problems. Very importantly from a Healthy Nations point of view, the Healthy Nations respondents were much more likely to link loss of Indian culture to alcohol and drug problems. Healthy Nations programs very strongly identify traditional values with the protection of people from alcohol and drug misuse.

Similarly, Healthy Nations respondents showed more conservative norms as they reported much lower levels of alcohol consumption as linked to drunkenness for both males and females.

Finally, Healthy Nations sites reported equal levels of information on FAS emanating from healthcare providers and relatives, and they were equally likely to know about FAS. But they were more likely to have been informed about FAS from a traditional healer.

Conclusions

Without pre-program, baseline information on these variables from which to determine magnitude of change, it is impossible to link these differences directly to the Healthy Nations activities. However, most of the variables on which differences were found were those emphasized by Healthy Nations. The program

encouraged participation in traditional ceremonies for alcohol- and drug-abuse prevention; the program emphasized abstinence and/or moderation of drinking practices; and reducing the harm from alcohol use were all themes of Healthy Nations communities. Almost all of the variables cluster in these areas, which lends support to the efficacy of the Healthy Nations Initiative. Furthermore, since there were virtually no major demographic or socioeconomic differences between the two large samples, one can be more confident that there is at least a perceptual or normative difference in these two groups, some of which may be attributable to the RWJ Healthy Nations activities.

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