

Alcohol Consumption Behaviors and Ethnicity in Hawaii

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ABSTRACT

The purpose of this study is to provide baseline information on the risk-taking health behavior of alcohol consumption in four ethnic groups, Caucasian, Chinese, Japanese, and Korean, residing in the State of Hawaii. Secondary data from the State-based Health Behavioral Risk Factor Surveillance System, designed by the Center for Disease Control, were used. The total sample analyzed for this study contained 6,068 persons. Univariate and logistic regression analysis were performed in order to determine sociodemographic profiles and the predictor variables to produce the findings of this study. The percentage distribution of six sociodemographic factors by race was very similar in all alcohol consumption factors, acute drinking, chronic drinking, and drinking and driving. In this study there were significant ethnic differences in alcohol consumption factors except drinking and driving.

Key Words : risk-taking behavior, ethnicity, acute drinking, drinking and driving, chronic drinking

I. Introduction

Alcohol has been used by Americans more than any other drug, including tobacco products (O'Brien and Chafetz, 1991). According to the report from the Surgeon General's workshop (1989), in all, some 18 million American adults are either alcoholics or have alcohol abuse problems. Healthy People (1979) reports that alcohol abuse is the cause of more than 10 percent of all deaths in the U.S. It is the principal related cause of 2 out of 10 leading causes of death due to motor vehicle accidents and cirrhosis and a contributor to many other causes of mortality (U.S. Department of Health, Education and Welfare, 1978).

Caucasians, the dominant ethnic group representing 84.3 percent of the population in the U.S. (U.S. Department of Commerce, Bureau of the Census, 1990) is well known as a high risk ethnic group regarding alcohol related problems. On the other hand, there is a general notion in terms of alcohol consumption that Asian-Americans are often considered a non-drinking group (Chi et al., 1989). Research studies have generally supported that Asian-Americans do not consume alcohol as much as Caucasian-Americans and Europeans (Schwitters et al., 1982; Kitano,

1982; Kitano, 1986/87; Chi et al., 1989; Phillip et al., 1989).

In the State of Hawaii, there is no single ethnic majority group. According to the U.S. Census, 1990, Caucasians constitute 33.4 percent and Asian-Pacific Islanders represent 61.8 percent of the State's population (Star Bulletin, June 14, 1991) with Asians representing approximately 47 percent of that 61.8 percent.

Even with the relatively small proportion of Caucasians, alcohol related problems are still among the leading causes of death in the State of Hawaii for residents. Motor vehicle accidents were the seventh leading causes of death and cirrhosis of the liver was the tenth leading cause of death in 1987 (Hawaii State Department of Health, 1987). In addition, the State of Hawaii received dubious honors once the results of the CDC's three-year, forty-State survey of nationwide drinking habits were in (Star Bulletin, June 25, 1991): "Hawaii has the worst chronic alcohol problem. It is close to the worst for binge drinking ranking 36 out of 40. And it also is one of the worst in the area of drinking and driving, ranking 31 out of 40."

Therefore, in an ethnically diverse community like the State of Hawaii, a consideration of the sociocultural influences on alcohol consumption by different ethnic groups is important. Special focus should be

given to the Asian-American group in order to obtain a clear picture of its alcohol use profile and to test generalized notions about its alcohol consumption in this State.

Schaefer (1982) observed that each cultural group experiences its own drinking opportunities, limitations, and functions, combining into different lifestyles played out against the same contemporary American backdrop. Though Asian-Americans' alcohol consumption pattern might become similar to Caucasians', as they integrate into the dominant culture (Chi et al., 1989), these patterns would still retain considerable differences related to their ancestral cultures.

Kitano (1982) found that most studies have predicted a rise in alcohol consumption and alcohol-related problems as acculturation happens. Therefore, in order to prevent, intervene, or treat alcohol related problems and to create an effective health policy sensitive to the needs of the community in the State of Hawaii, it is essential to identify the ethnic variations and differences in relation to alcohol consumption.

The purpose of this study is 1) to provide a descriptive sociodemographic profile in four ethnic groups, Caucasian, Chinese, Japanese, and Korean, residing in the State of Hawaii, 2) to predict high risk groups among the four ethnic groups, and to predict important sociodemographic predictor variables related

to alcohol consumption in each ethnic group.

II. Method

1. Background of the Study

The data for this study came from the State-based Health Behavioral Risk Factor Surveillance System (BRFSS), designed by the Centers for Disease Control (CDC). Alcohol use was one of the risk factors surveyed in Hawaii for five years from 1986 to 1990. Since 1981 this ongoing BRFSS has conducted random digit-dialed telephone surveys with standardized survey methods and questionnaires in collaboration with the CDC. Telephone interviews were conducted during one week of every month to yield annual estimates that were seasonally adjusted. Subjects for this BRFSS were selected randomly from civilian residents with a telephone.

The State of Hawaii has participated in this system since 1984. The sample was randomly chosen from among the total Hawaii population by telephone. To select a sample, a stratified cluster sampling design based on clusters of telephone numbers was used. Three households were chosen and completed from each cluster for telephone interviews. After contacting the selected household, the interviewer randomly selected an adult

household member, 18 years or older. If the interviewee was not available at the initial call, the interview was attempted another time before selecting another respondent.

2. Sample of the Study

Chart 1 presents information on the sample for this study. Chosen subgroups for this study are Caucasians, Chinese, Japanese, and Koreans residing in the State of Hawaii. In the five year study period the total sample size was 6,068 persons. Among them, Caucasians made up 3,325 persons; Chinese 389 persons; Japanese 2,228 persons; and Koreans 126 persons. The ethnic percentage distribution of each study year has been similar. Because of the small proportions of the total Chinese and Korean population group, these subgroups were pooled as others for the BRFSS annual reports.

3. Measurement of the Study

The BRFSS interview questionnaire contains many behavioral risk factors. But the questions for the purpose of this study deal with two parts: sociodemographic factors and alcohol-related risk factors.

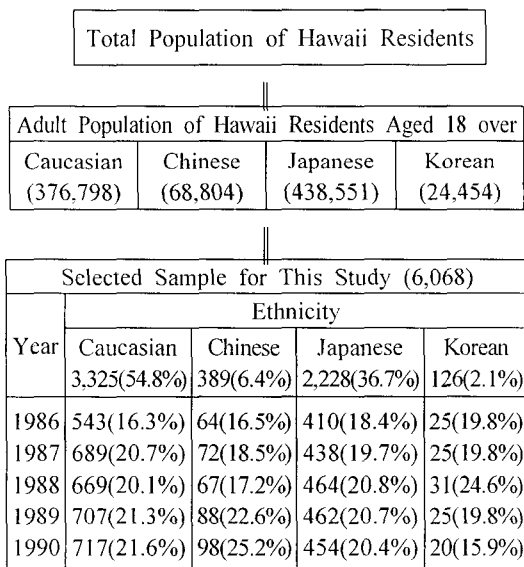
The sociodemographic component included the same 8 factors for all five years of the

Hawaii BRFSS. However, for this study the factor dealing with island status was excluded for the sociodemographic factors. Therefore, seven sociodemographic factor of age, sex, race, educational status (EDUC), employment status (EMP), marital status (STAT), and household income were chosen for analysis in this study.

Alcohol consumption factors consisted of three risk-taking behaviors: acute drinking (ACUTE), chronic drinking (CHRON), and Drinking and Driving (DRIV). The original study design, employed during the first three years (1986-1988), consisted of nine questions regarding the above risk-taking behaviors. The questions concerned current drinking patterns, the frequency and quantity of beer, wine, and liquor, and the frequency of DRIV. During the latter two years (1989-1990), four questions relating to the average frequency and quantity of specifically drinking beer, wine, and liquor were omitted.

For this study, the results of the remaining five questions relating to current drinking, average frequency of drinking and the quantity of drinking an alcoholic beverage were employed. From the responses of these five major questions, three alcohol consumption factors were categorized into ACUTE, DRIV, and CHRON based on the CDC definition. The definitions of these factors developed by the CDC are as follows:

ACUTE is defined as "having five or more drinks on an occasion, one or more times during the past month"; CHRON is defined as "having 60 or more drinks during the past month"; and DRIV is defined as "driving after having had too much to drink, one or more times during the past month". Each of these alcohol consumption factors was again divided into two groups, namely 'risk group' and 'non-risk group'.



<Fig. 1> Sample for This Study

4. Data Collection

Professional interviewers from a survey and research firm located in Honolulu conducted the BRFSS surveys. They received training and technical assistance from the CDC. The

data were collected for one week each month during the evening and on weekends.

5. Data Analysis

The Statistical Package for Social Science (SPSS/PC+) was employed for data analysis in this study.

Initially, univariate analysis was used to describe the profile of the study sample by ethnicity in each alcohol consumption factor.

In the second stage, logistic regression analysis of a multivariate statistical technique was conducted to identify ethnic differences and to distinguish important sociodemographic predictor variables for each ethnic group in alcohol consumption. For this analysis, the method of 'enter' with 'deviation-variable coding scheme' was chosen to compare the effect of each category to the average effect of each category.

III. Results

1. Profile of the Sample

A total of 6,068 adults in four ethnic groups residing in Hawaii was surveyed to assess risk behaviors related to alcohol consumption. Major sociodemographic profiles of the study sample are present in tables 1 to 3.

<Table 1> Major Sociodemographic Characteristics by Race in ACUTE (% Distribution)

Race (N)	Total (6,068)	Caucasian (3,325)	Chinese (389)	Japanese (2,228)	Korean (126)
Factors					
Sex					
Male	46.7	48.4	50.5	44.4	32.3
Female	53.3	51.6	49.5	55.6	67.7
Age					
18-24	9.0	10.5	8.4	6.8	11.5
25-34	23.1	26.4	22.2	18.5	23.0
35-44	24.0	26.6	22.5	20.3	24.6
45-54	12.4	12.5	9.7	12.7	12.3
55-64	13.9	10.8	17.5	17.6	16.4
65+	17.6	13.2	19.8	24.0	12.3
Education					
- Grade 8	5.9	3.1	3.9	10.3	6.6
Some HS	6.4	5.2	3.4	8.3	10.5
HS Grad	27.2	26.0	27.5	28.3	37.7
Technical	4.4	3.4	4.4	5.8	4.1
Some College	23.5	27.8	20.7	18.3	14.8
College Grad	21.2	20.3	28.8	21.6	17.2
Post-Grad	11.5	14.3	11.4	7.5	9.0
Employment					
For Wages	56.1	56.3	55.4	56.8	39.5
Self-Empl	11.2	14.2	9.6	6.9	13.9
Unemployed	3.4	4.8	1.3	1.8	5.7
Homemaker	6.9	7.4	4.4	6.0	16.4
Student	3.1	2.7	5.4	2.9	6.6
Retired	19.3	14.6	23.8	25.6	18.0
Married Status					
Married	56.8	54.5	58.1	59.4	65.3
Divorced	11.3	14.5	5.8	7.5	12.9
Widowed	8.0	7.0	7.9	9.6	4.0
Separated	2.1	2.8	1.8	1.1	0.8
Never Married	19.8	18.6	24.3	21.2	15.3
Unmar Couple	2.1	2.6	2.1	1.2	1.6
Factors					
Income					
≤ \$10,000	11.3	10.6	10.1	12.4	12.7
\$10-14,999	10.7	10.9	10.4	10.3	14.7
\$15-19,999	11.4	11.3	9.0	11.8	15.7
\$20-24,999	11.4	12.3	9.0	10.4	13.7
\$25-34,999	18.6	19.1	19.1	17.7	16.7
\$35-50,000	17.4	16.6	17.3	18.8	14.7
\$50,000 +	19.1	19.0	25.1	18.6	11.8

<Table 2> Major Sociodemographic Characteristics by Race in DRIV (% Distribution)

Race (N)	Total (6,068)	Caucasian (3,325)	Chinese (389)	Japanese (2,228)	Korean (126)
Factors					
Sex					
Male	46.8	48.5	50.4	44.4	31.7
Female	53.2	51.5	49.6	55.6	68.3
Age					
18-24	9.0	10.5	8.3	6.7	11.3
25-34	23.1	26.3	22.1	18.5	23.4
35-44	24.0	26.5	22.4	20.5	25.0
45-54	12.4	12.5	9.6	12.6	12.1
55-64	13.9	10.9	17.4	17.6	16.1
65+	17.6	13.2	20.1	24.1	12.1
Education					
- Grade 8	5.9	3.2	4.1	10.3	7.3
Some HS	6.3	5.3	3.4	8.2	10.5
HS Grad	27.2	26.0	27.4	28.4	37.9
Technical	4.4	3.4	4.4	5.9	4.0
Some College	23.5	27.7	20.7	18.3	14.5
College Grad	21.2	20.3	28.7	21.5	16.9
Post-Grad	11.5	14.2	11.4	7.5	8.9
Employment					
For Wages	56.0	56.1	55.3	56.8	39.5
Self-Empl	11.3	14.3	9.6	6.9	13.7
Unemployed	3.5	4.8	1.3	1.8	5.6
Homemaker	6.9	7.4	4.7	6.0	16.9
Student	3.0	2.7	5.4	2.9	6.5
Retired	19.3	14.7	23.8	25.6	17.7
Married Status					
Married	56.7	54.4	58.0	59.5	65.9
Divorced	11.4	14.6	5.7	7.5	12.7
Widowed	8.0	7.0	8.1	9.5	4.0
Separated	2.1	2.8	1.8	1.1	0.8
Never Married	19.8	18.7	24.3	21.1	15.1
Unmar Couple	2.0	2.6	2.1	1.2	1.6
Factors					
Income					
≤ \$10,000	11.3	10.6	10.4	12.4	12.7
\$10-14,999	10.7	10.9	10.4	10.4	14.7
\$15-19,999	11.5	11.4	8.9	11.8	15.7
\$20-24,999	11.4	12.3	8.9	10.4	13.7
\$25-34,999	18.6	19.2	19.0	17.8	16.7
\$35-50,000	17.4	16.5	17.3	18.8	14.7
\$50,000 +	19.1	19.1	25.1	18.6	11.8

〈Table 3〉 Major Sociodemographic Characteristics by Race in CHRON (% Distribution)

Race (N)	Total (6,068)	Caucasian (3,325)	Chinese (389)	Japanese (2,228)	Korean (126)	
Factors						
Sex						
Male	46.8		48.5	50.6	44.5	31.7
Female	53.2		51.5	49.4	55.5	68.3
Age						
18-24	9.0		10.5	8.3	6.8	11.3
25-34	23.1		26.3	22.3	18.4	23.4
35-44	24.0		26.5	22.3	20.5	25.0
45-54	12.4		12.6	9.6	12.6	12.1
55-64	13.9		10.9	17.4	17.7	16.1
65+	17.6		13.2	20.2	24.0	12.1
Education						
- Grade 8	5.9		3.2	4.1	10.3	7.3
Some HS	6.3		5.2	3.3	8.3	10.5
HS Grad	27.2		25.9	27.5	28.4	37.9
Technical	4.4		3.4	4.4	5.9	4.0
Some College	23.5		27.7	20.6	18.2	14.5
College Grad	21.2		20.3	28.8	21.4	16.9
Post-Grad	11.5		14.2	11.3	7.6	8.9
Employment						
For Wages	56.0		56.1	55.3	56.9	39.5
Self-Empl	11.3		14.3	9.5	6.9	13.7
Unemployed	3.4		4.8	1.3	1.7	5.6
Homemaker	6.9		7.4	4.6	6.0	16.9
Student	3.0		2.7	5.4	2.9	6.5
Retired	19.4		14.7	23.9	25.6	17.7
Married Status						
Married	56.7		54.3	57.7	59.4	65.9
Divorced	11.4		14.6	5.7	7.5	12.7
Widowed	8.0		7.1	8.1	9.6	4.0
Separated	2.1		2.8	2.1	1.1	0.8
Never Married	19.9		18.7	24.4	21.2	15.1
Unmar Couple	2.0		2.6	2.1	1.2	1.6
Factors						
Income						
≤ \$10,000	11.3		10.6	10.3	12.4	12.7
\$10-14,999	10.7		10.9	10.3	10.4	14.7
\$15-19,999	11.5		11.4	8.9	11.8	15.7
\$20-24,999	11.5		12.4	9.2	10.3	13.7
\$25-34,999	18.6		19.1	18.9	17.8	16.7
\$35-50,000	17.3		16.5	17.2	18.8	14.7
\$50,000 +	19.1		19.0	25.2	18.6	11.8

Table 1 show the percentage distribution of six sociodemographic factors by race in ACUTE. The majority of the sample were in the 25-44 year old age group, were married, had a post-high school education, were employed for wages and had a middle class income of over \$25,000. The number of females was slightly larger than males.

The sociodemographic profile of Caucasians and Chinese was similar to the total profile of the sample. However, the proportion of Chinese 55 years and above was similar to younger age groups (25-44 years old). Furthermore, the proportion of the retired population among Chinese subjects was higher than all other ethnic groups except Japanese. In addition, among the four ethnic groups, the Chinese group had the largest never-married subgroup and the highest percentage of subjects in the \$50,000+ income level.

The Japanese profile resembled the Chinese. Age distribution of Japanese subjects is noteworthy. Percentage of Japanese 55 year and above was the largest among the four ethnic groups. Additionally, within the Japanese sample, the 65+ age group contributed the highest percentage of all age groups, and had the highest proportion of retired subjects within the four ethnic groups.

In general, the Korean profile seemed similar to the Caucasian profile, however, the

percentage of females was much higher than that of the males. In addition, among the four ethnic groups, the Korean group had the largest married subgroup, and regarding employment status, Koreans occupied the largest homemaker subgroup.

Table 2 and 3 reveal major sociodemographic characteristics by race in DRIV and CHRON. However, these two tables show very similar distribution to ACUTE for sociodemographic factors. Therefore, these differences are regarded as negligible quantities.

2. Predictors of Alcohol Consumption Factors for Each Ethnic Group

In order to investigate the predictors of alcohol consumption by various sociodemographic factors, logistic regression analysis was conducted. Under method, the 'enter' option was selected so that all variables could be entered in a single step. This part reveals the cases by ethnicity included in this analysis. Because cases with missing data were rejected, approximately 87 percent of the total sample for each ethnic group were finally included in the analysis of the three alcohol consumption factors. For each alcohol consumption factor, Caucasian groups were consistently the largest, while

Korean groups were the smallest.

Table 4 to 6 summarize the results of logistic regression analysis for each alcohol consumption factor. Variables that were statistically significant in logistic regression analysis were chosen as meaningful predictors for each type of alcohol consumption. Predictors of ACUTE, DRIV, and CHRON were different for each ethnic group. These predictors, organized under each type of drinking, are as follows:

Acute Drinking

Table 4 summarizes the results of logistic regression analysis in ACUTE. The predictors of ACUTE were: 'sex', 'age', 'race', 'STAT', and 'EDUC' for the total sample; 'sex', 'age', and 'EDUC' for Caucasians; 'sex', 'STAT', and 'income' for Chinese; 'sex', 'age', and 'STAT' for Japanese. None of the predictor variables turned out to be significant for Koreans. This may be due to a very small size of Koreans.

Ethnic differences in risk were found. Table 4 does not display the value of the coefficient for the first (reference) categories, that is, for Caucasian in 'race' and married in 'STAT'. The calculation of the undisplayed value of the coefficient is performed by negating the sum of the displayed coefficient (SPSS INC., 1989). Consequently, the value of the coefficient for Caucasians was $.4395 - (-.3775 + .0512 - .1132) = .4395$ } . The calculation proved that Caucasians were the

highest risk group whereas the Chinese were the lowest (Caucasian > Japanese > Korean > Chinese).

The results below show that 'sex' acts as a common predictor of ACUTE but that the magnitude of risk differs for each ethnic group. 'Male' was noted as a common higher risk group in all ethnic groups. Asian-American groups, Chinese and Japanese, yield larger differences of risk between males and females than did the Caucasian group. The Chinese group showed that largest difference for 'sex' followed by the Japanese.

As shown in Table 4, the risk of ACUTE decreased according to increasing 'age' and higher 'EDUC' in all significant variables.

The coefficient value for the unlisted category of 'STAT' was calculated in the same way as in 'race'. The values of the coefficients for the concealed category of 'married' was as follows: $-.3193$ for the total sample; -1.3441 for Chinese; and $.5553$ for Japanese. In accordance, 'separated' was the highest risk subgroup in both the total sample (separated > divorced > unmarried couple > never married > widowed > married) and in the Chinese sample (separated > unmarried couple > divorced > never married > widowed > married). However, the risk by marital status was noticeably different between the Chinese and Japanese. 'Married' was the highest risk subgroup for the

〈Table 4〉 Summary of Results of Logistic Regression Analysis in ACUTE

Group	Variable	B	S.E	WALD	DF	Significance
Total	Sex	-.6137	.8690	344.5497	1	.0000
	Age	-.3571	.3690	93.5447	1	.0000
	Race			36.7850	3	.0000
	Chinese	-.3775	.1556	5.8881	1	.0152
	Japanese	.0512	.1056	.2349	1	.6279
	Korean	-.1132	.2448	.2136	1	.6439
	Stat			25.7654	5	.0001
	Divorced	.1435	.1091	1.7307	1	.1883
	Widowed	-.1856	.2046	.8230	1	.3643
	Separated	.2054	.1988	1.0675	1	.3015
	Never Married	.0183	.0973	.0353	1	.8509
Unmarried Cou	.1377	.1949	.4992	1	.4799	
Educ	-.1013	.0199	25.9649	1	.0000	
Caucasian	Sex	-1.3713	.1035	175.4473	1	.0000
	Age	-.3702	.0468	62.6951	1	.0000
	Educ	-.1225	.1243	25.3923	1	.0000
Chinese	Sex	-3.3205	.7310	20.6311	1	.0000
	Stat			12.3473	5	.0303
	Divorced	-.0874	.7290	.0144	1	.9046
	Widowed	-.7780	1.0005	.6047	1	.4368
	Separated	1.8445	.8984	4.2146	1	.0401
	Never Married	-.6755	.4800	1.9808	1	.1593
	Unmarried Cou	1.0405	.8855	1.3806	1	.2400
Income	.2261	.1007	5.0390	1	.0248	
Japanese	Sex	-2.2682	.1897	143.0274	1	.0000
	Age	-.2892	.0702	16.9739	1	.0000
	Stat			16.5100	5	.0055
	Divorced	-.4497	.2559	3.0877	1	.0789
	Widowed	-.6545	.4736	1.9099	1	.1670
	Separated	.175	.5640	.0968	1	.7557
	Never Married	.2258	.2080	1.1780	1	.2778
	Unmarried Cou	.1476	.4629	.1016	1	.7499
Korean	.					

Japanese (married > never married > separated > unmarried couple > divorced > widowed) while it was the lowest risk subgroup for the Chinese.

Only the Chinese group showed 'income' as a significant predictor of risk. This implies that higher income Chinese are higher risk-taker in ACUTE.

Drinking and Driving

Table 5 illustrates the significant predictors in DRIV. The predictable factors of DRIV were 'sex', 'age', 'EMP', and 'STAT' for total sample; 'sex', 'age', and 'EMP' for Caucasians; 'sex', 'age', and 'EDUC' for Japanese. No significant predictors were found for both Chinese and Koreans.

Ethnic differences were not found in DRIV.

Males were commonly at higher risk than females. The Japanese showed larger risk differences between males and females than did Caucasians.

Increasing age was likely to reduce risk. However, Caucasians had a greater magnitude of risk than did Japanese in 'age'.

<Table 5> Summary of Results of Logistic Regression Analysis in DRIV

Group	Variable	B	S.E	WALD	DF	Significance
Total	Sex	-1.1105	.1692	43.0690	1	.0000
	Age	-.3605	.0731	24.2977	1	.0000
	EMP			13.9076	5	.0162
	Self-employed	.7689	.2122	13.1278	1	.0003
	Unemployed	-.1126	.3811	.0874	1	.7676
	Homemaker	-.4527	.5115	.7831	1	.3762
	Student	-.0543	.3557	.0233	1	.8786
	Retired	-.5129	.4176	1.5085	1	.2194
	STAT			17.5478	5	.0036
	Divorced	-.1615	.2175	.5513	1	.4578
	Widowed	-.6169	.6202	.9895	1	.3199
	Separated	.5998	.3289	3.3254	1	.0682
	Never Married	.1109	.1939	.3272	1	.5673
	Unmarried Cou	.1740	.3326	.2738	1	.6008
Caucasian	Sex	-.9467	.2038	21.5856	1	.0000
	Age	-.4783	.0987	23.5065	1	.0000
	EMP			18.0274	5	.0029
	Self-employed	.9413	.2406	15.3075	1	.0001
	Unemployed	-.4494	.4629	.9428	1	.3316
	Homemaker	-.3220	.5270	.3732	1	.5412
	Student	-.0707	.4424	.0256	1	.8730
Retired	-.2852	.5718	.2488	1	.6180	
Chinese						NS
Japanese	Sex	-1.4050	.3372	17.3635	1	.0000
	Age	-.2527	.1282	3.8827	1	.0488
	EDUC	-.1530	.0741	4.2620	1	.0390
Korean						NS

<Table 6> Summary of Results of Logistic Regression Analysis in CHRON

Group	Variable	B	S.E	WALD	DF	Significance
Total	Sex	-1.4980	.1240	146.0224	1	.0000
	Race			27.5453	3	.0000
	Chinese	-.4475	.2286	3.8320	1	.0503
	Japanese	.0616	.1510	.1664	1	.6834
	Korean	-.1364	.3573	.1458	1	.7026
	Stat			11.5379	5	.0417
	Divorced	.3574	.1382	6.6925	1	.0097
	Widowed	-.1256	.2334	.2895	1	.5905
	Separated	.0165	.2730	.0037	1	.9518
	Never Married	.0246	.1323	.0346	1	.8525
	Unmarried Cou	-.1499	.2959	.2567	1	.6124
	Educ	-.0698	.0252	7.6446	1	.0057
	Income	.0567	.0254	4.9832	1	.0256
Caucasian	Sex	-1.2118	.1420	72.8452	1	.0000
	EMP			12.9814	5	.0236
	Self-employed	.3998	.1525	6.8683	1	.0088
	Unemployed	-.2348	.2827	.6893	1	.4063
	Homemaker	-.2060	.2640	.6092	1	.4351
	Student	-.1521	.3545	.1840	1	.6679
	Retired	-.1179	.2165	.2964	1	.5962
Chinese	Sex	-1.9435	.7924	6.0154	1	.0142
Japanese	Sex	-2.3236	.3032	58.7266	1	.0000
	Educ	-.2190	.0538	16.5725	1	.0000
Korean	NS

For the Japanese, 'EDUC' acted as a predictor, indicating that those with a higher education were less at risk.

The unlisted values of the coefficients for 'EMP' in the 'for wages' category were .3636 for the total sample and .1860 for the Caucasians. As a result, people with wages were in the highest risk of DRIV. In particular, the subgroup 'self-emp' showed a noticeable deviation from other groups.

'STAT' revealed statistical significance only

for the total sample. The undisplayed value of the coefficient for 'married' was -.4293. The subgroup 'separated' had the highest risk.

Chronic Drinking

The predictors of CHRON are revealed in Table 6. Significant predictors in CHRON were: 'sex', 'race', 'STAT', 'EDUC', and 'Income' for the total sample; 'sex' and 'EMP' for Caucasians; 'sex' for Chinese; 'sex' and

'EMP' for Japanese. Koreans, however, did not yield any significant predictive variables in CHRON.

Significantly different relationships were found among the four ethnic groups. The value of the coefficient for Caucasians was .5223 (not displayed in the table). According to the data, the highest risk group was Caucasian and the lowest was Chinese (Caucasian > Japanese > Korean > Chinese).

A difference in risk by 'sex' occurred among three ethnic groups: Caucasian, Japanese, and Chinese. Males in the above ethnic groups showed a higher risk than females. Japanese had the largest difference of risk between males and females, followed by Chinese. Caucasians showed the smallest difference of risk by 'sex'.

The 'age' factor was not a significant predictor for any of the ethnic groups.

Higher education affected the smaller risk of CHRON in the total sample and in the Japanese group.

The unlisted value of the coefficient for Caucasians in 'EMP' in the 'for wages' category was .311. Accordingly, the group 'self-emp' had the highest risk, followed by 'emp for wages'.

The coefficient value for the 'married' group in the total sample was -.1230. Thus, in the total sample, the group 'divorced' was identified as the highest risk group (divorced

> never married > separated > married > widowed > unmarried couple).

IV. Discussion and Summary

Mullen et al. (1987) found that sociodemographic characteristics are important predictors of health behavior. Particularly, ethnicity has been considered one of the most meaningful variables because it presents the sociocultural background of an individual. In order to study different patterns of risk-taking behavior or the behavioral risk factors of alcohol consumption, rather than a broad racial category, ethnicity - which represents the socio-cultural background of the individual along with biological ramifications - would be the better variable. Even though the importance of ethnicity in alcohol related studies is widely recognized, most existing studies have misused the term ethnicity (Heath, 1990-91). Kandel et al. (1976) also reported that ethnicity is used interchangeably with the term a race in most studies.

The present study utilized data from Hawaii's BRFSS report for the period 1986 to 1990. CDC criteria, definition, classification, and coding keys were used to measure alcohol consumption behaviors. In Hawaii's BRFSS surveys, the term 'race' was chosen as one of the demographic variables.

"What is your race?" was the only question that was asked to the respondent concerning his or her racial background and the answer was recorded through a self-reporting method. Whether or not the respondent came from a mixed racial or ethnic background could not be accurately determined. In addition, Chinese, Japanese, and Koreans altogether made up a single racial category in the BRFSS survey. The more than 20 nationalities covered by the single term Asian-American each have their own distinct culture (Kitano, 1982).

Alcohol consumption has different ramifications and varied connotations according to the society in which a person was socialized, the degree of retention of one's ethnic culture, the generation of the person, and the preference of ethnicity by the host society. Furthermore, each ethnic group is likely to provide a different picture of drinking values, norms, and perceptions or drinking behaviors.

Therefore, questions should be raised as to whether the racial classification of BRFSS study truly represents each racial or ethnic group. Even the widely used category 'Caucasians' includes a variety of ethnic groups. Each ethnic group in turn could be conditioned by different degrees of risk-taking behaviors in alcohol consumption. Caucasians of Irish, French, or Italian backgrounds

exhibit alcohol consumption patterns that are regarded as high risk whereas ethnic Jews form patterns that are more often regarded as low risk (Wilkinson, 1970).

Another questionable point concerns the CDC's the definition of alcohol consumption. The CDC defines acute drinking as "having five or more drinks on an occasion, one or more times during the past month". The measurement of the unit 'drink' was left purely subjective and alcohol content (ethanol content) was not specified. Drinking and driving is interpreted as "driving after having had too much to drink, one or more times during the past month". In this case, "too much to drink" varies widely according to an individual's perception or misperception. The concepts associated with alcohol consumption should not depend on nature (biological-psychological-biochemical phenomena) alone but also nurture (social-psychological-cultural phenomena) (Schaefer, 1982).

Logistic regression analysis identifies ethnic differences and predicts important sociodemographic variables in alcohol consumption factors. In this study there were significant ethnic differences in alcohol consumption factors except in DRIV.

In both ACUTE and CHORN, the order of risk among the four ethnic groups from high to low was as follows: Caucasians, Japanese, Korean, Chinese. There was no finding of

ethnic differences and the risk order in DRIV generally support the previous studies.

Among the sociodemographic factors for the total study sample, 'sex', 'age', 'race', 'STAT', and 'EDUC' were identified as good predictors for ACUTE, the higher risk group being young, single Caucasian males with lower educational status. Significant predictors for DRIV were 'sex', 'age', 'EMP', and 'STAT'. The higher risk groups were the younger employed, single males; there were no differences among ethnic groups. 'Sex', 'race', 'STAT', 'EDUC', and 'income' were significant predictors of CHRON. The considerable risk group in CHRON was of single, Caucasian males with lower education level and higher income.

The significant predictive factors by ethnicity are outlined below: For Caucasians, 'sex', 'age', and 'EDUC' were good predictors in ACUTE. Younger males with lower education formed the higher risk group. In DRIV, predictive factors were 'sex', 'age', and 'EMP', with self-employed younger males as the high risk group. 'Sex' and 'EMP' were revealed as predictors for CHRON, specifically focusing on self-employed males.

For Chinese, predictors were 'sex', 'STAT', and 'income' in ACUTE. DRIV did not yield significant results, thus making it impossible to predict relevant sociodemographic factors of alcohol consumption. 'Sex' was the only

meaningful predictor in CHRON.

For Japanese, 'sex', 'age', and 'STAT' in ACUTE were identified as useful predictors. In DRIV, meaningful predictors were 'sex', 'age', and 'EDUC'. 'Sex' and 'EDUC' proved statistically significant predictor variables in CHRON.

For Koreans, no significant relationship was found between any of the alcohol consumption factors and the sociodemographic factors. As a result, Koreans were excluded from the comparison of ethnic groups. This phenomenon may be due to the small sample size.

The above results indicate the many differences between the total sample and each sub-ethnic group, and among the four ethnic groups themselves, which complicate the issue of alcohol consumption. Researchers have to be aware that a multiethnic society is not only culturally diverse but continually changing under the dynamic and destabilizing processes of limited cultural preservation and attempts at assimilation and amalgamation. Accordingly, predictors of alcohol consumption derived from the total sample do not adequately represent all sub-ethnic groups - including Caucasians.

Furthermore, due to the methodology, this study encountered some limitations in generalizing the results. First, this survey did not provide the means to adequately

distinguish ethnic differences among the four ethnic target groups. Second, a disparity of subsample sizes can act as a major limitation. Particularly, the sample sizes for Chinese and Koreans were too small to be analyzed or compared. Third, of people at risk to produce statistically significant results. Therefore, further studies are needed to overcome the limitations of this study.

V. Conclusion

The findings of the present study suggest that further research is needed regarding the underlying socio-cultural factors that contribute to the apparent ethnic differences in risk for each type of alcohol consumption. Because this study used secondary data from the BRFSS, only generalized sociodemographic factors for ethnicity could be determined.

Another aspect to consider is that although Hawaii is a multi-ethnic society, health programs in the United States relating to alcohol consumption are geared towards middle class populations and are based exclusively on western values and concepts of socialization and family structure. Therefore, future research studies should be more focused upon the concept of ethnicity. An objective measurement of the categories of alcohol consumption and a clear and

measurable concept of ethnicity, including degrees of adaptation and acculturation, must be examined. With fulfillment of the preconditions, culturally appropriate intervention and/or prevention programs for those at risk across all ethnic groups be formed and put into action.

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