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RISKY DRINKING, ALCOHOL USE DISORDERS AND HEALTH SERVICES UTILIZATION IN THE U.S. GENERAL POPULATION: DATA FROM THE 2005-2010 NATIONAL ALCOHOL SURVEYS

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Abstract

Background—While alcohol-related problems have been found to be overrepresented in clinical samples of patients, less is known about health services utilization in the general population.

Methods—To explore the association of risky drinking and alcohol use disorders (AUD) with in-patient and out-patient services utilization, data are analyzed from a merged sample of 13,165 respondents in the 2005 and 2010 U.S. National Alcohol Surveys. Propensity score weighting was used to minimize potential bias associated with the heterogeneity in individual-level characteristics across respondents which might influence these relationships.

Results—No significant differences were found between risk and non-risky drinkers on any of the utilization variables in the last year, with 11% reporting an ER visit, a third reporting a primary care visit, and 6.2-7.6% reporting hospitalization. Those with an AUD were significantly more likely than those without to report an ER visit in the last year (18.2% vs. 11.6%; p=0.003) as well as a greater number of such visits (p=0.007), and to report more primary care visits (p=0.05) and any hospitalization (11.2% vs. 6.7%; p=0.019).

Conclusion—The data suggest a significant and potentially costly increase in health services utilization due to AUD . ERs and primary care settings would benefit from devoting increased resources to addressing AUD, which could result in clinical benefits of improvement in overall health status as well as economic benefits in lowering health care costs for both patients and society as a whole.

INTRODUCTION

Heavy drinking and alcohol-related problems have been found to be overrepresented in probability samples of patients seen in primary care settings and the emergency room (ER) compared to the general population (Cherpitel, 1995; Cherpitel, 2007). Large proportions of those with alcohol use disorders (AUD) in the U.S. are most likely to obtain services for these problems outside of the mental health or substance abuse treatment system (Kessler et al., 1994; Regier et al., 1993), which may account, in part, for this overrepresentation. Additionally, more frequent users of ERs or primary care clinics are more likely to fall into

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samples drawn from these facilities than less frequent users. A study of injured ER patients across 14 countries found that heavy drinking and drinking symptomatic of alcohol dependence were predictive of ER utilization in the previous year (Cherpitel et al., 2006).

Less is known about the association of alcohol use with primary care and ER utilization in general population samples, however, which may provide a better understanding of the burden which alcohol places on the general health care system and characteristics of these individuals. Those studies which have been conducted have found mixed results, with some demonstrating a negative or no association (Armstrong et al., 1998; Baumeister et al., 2006; Rice et al., 2000; Zarkin et al., 2004), while others have found positive associations (Anzai et al., 2005; Blose and Holder, 1991; Cherpitel, 1999a; Cherpitel, 1999b; Cryer et al., 1998). While most of these studies have found a linear relationship between drinking and both in-patient and out-patient services utilization, a U-shaped relationship between drinking and in-patient utilization has also been found (Anzai et al., 2005), suggesting that both abstainers and heavy drinkers had the highest rates of utilization compared to light and moderate drinkers.

Several of the above studies were not conducted in the United States, however, and differences in health care systems and coverage may have influenced findings. Data from the 1995 U.S. National Alcohol Survey (NAS) of the general population found prior treatment for substance use problems was predictive of ER utilization (Cherpitel, 1999b), while these data compared to those from the 2000 NAS found a higher prevalence of alcohol dependence in 1995 for those reporting either ER or primary care use (Cherpitel, 2003), and similar data from the 2005 NAS found, controlling for gender, age, and health insurance, those reporting symptoms of alcohol dependence were 1.63 times more likely than those non-dependent to report primary care use ($p<0.05$) (Cherpitel and Ye, 2008).

To further explore drinking, AUD and health services utilization, data are analyzed from a merged sample from the 2005 and 2010 NAS, examining the association of risky drinking and AUD with in-patient and out-patient (primary care and ER) health services utilization. Propensity score weighting is used to minimize potential bias associated with the heterogeneity in individual-level characteristics across respondents which might influence these relationships. These data are important for a better understanding of the burden alcohol places on the U.S. health care delivery system and selection factors (including alcohol use) which may result in utilization, as well as for potential opportunities for identification of and intervention with problem drinking patients for a reduction in health services use and associated costs.

METHODS

Samples

Data analyzed are from the Alcohol Research Group's 2005 and 2010 NASs. Fieldwork for the 2005 was sub-contracted to DataStat, Inc., and for the 2010 survey to Micro International. Data for both surveys were collected using Random Digit Dial (RDD) Computer Assisted Telephone Interviews (CATI) of the U.S. general population 18 and over in all 50 U.S. states and the District, with an over-sampling of blacks and Hispanics, and an

over-sample of low-population states. Completed interviews were obtained on 6919 respondents, representing a 56% completion rate in the 2005 survey and 6246 respondents, representing a 52% response rate in the 2010 survey (which have been considered acceptable rates for telephone surveys (Frey, 1989)). Non-response for both surveys was due to refusals, incapacitation, language barriers and failure to establish contact.

Data Collection

Interviews were conducted with informed consent once contact had been established with the respondent by trained interviewers using a structured interview schedule of about 45 minutes in length. Hispanic respondents were given a choice of being interviewed in English or in Spanish, with bilingual interviewers. The Spanish version of the questionnaire underwent a process of translation and independent back-translation.

Instruments

Health services utilization—Respondents were asked the number of times they had used any type of health service for an injury or illness in the last 12 months, and separately, the number of times they had used the emergency department and the number of times they had made a primary care visit during this time. Respondents were also asked the number of days they had spent in the hospital as a patient during the last 12 months.

Risky Drinking—Risky drinking was based on both the respondent's average volume of consumption and maximum number of drinks in a drinking day. Questions were asked regarding the frequency of consuming wine, beer and spirits, separately, and frequencies split into the proportion of drinking days on which the respondents had five or more drinks, three or four drinks and one or two drinks, with response categories including nearly every time, more than half the time, less than half the time, once in a while, and never (Room, 1990). The average number of drinks consumed monthly for each beverage type was calculated and volume of alcohol consumption obtained by summing across the three types. Respondents were also asked the maximum number of drinks in a day during the last year (Greenfield et al., 2006). Risky drinking was defined as reporting 14 or more drinks weekly or 5 or more in a day at least once during the last year for men, and 7 or more in a week and 4 or more in a day for women.

DSM-V Alcohol Use Disorder—Alcohol dependence during the last year was measured by 17 items covering seven domains as used in past NASs for a Diagnostic and Statistical Manual 4th revision (DSM-IV) (American Psychiatric Association, 2000) diagnosis (Caetano and Tam, 1995; Caetano et al., 1997), and included tolerance, withdrawal, drinking more than intended, unsuccessful efforts to control use, giving up pleasures or interests to drink, spending a great deal of time in drinking activities, and continued use despite problems. A respondent was considered alcohol dependent if positive on three or more domains. Item content for a DSM-IV definition of alcohol abuse (significant drinking-related failure to fulfill major obligations at work, school or home; interpersonal problems; legal problems; and drinking in hazardous situations) was obtained using 12-month alcohol-related consequences involving workplace problems (3 items), trouble with the law (3 items), aggression and interpersonal problems (4 items), and drunk driving and accidents (3

items), as used in prior NASs (Midanik and Greenfield, 2000). Alcohol abuse was defined as a positive response on any of the four abuse domains and not dependent. Alcohol use disorder (dependence and abuse), based on DSM-5 criteria, collapsed the above domains, taking out the DSM-IV abuse items having to do with trouble with the law, and added a criterion on craving, taken from the International Classification of Disease (ICD-10) (World Health Organization, 1990) which resulted in 11 diagnostic criteria, with a score of two or more considered positive for AUD (Hasin et al., 2013).

All respondents were categorized as follows into three mutually exclusive categories: non-risky drinkers, risky drinkers, and dependent drinkers. A risky drinker who also met dependence criteria was considered dependent.

Demographic and related characteristics for Propensity Score Weighting— Demographic characteristics included: gender, age (18-29, 30-49, 50+), ethnicity (white, black, Hispanic, other), marital status (single, married, separated/divorced/widowed), educational attainment (less than high school, high school graduate, some college, college graduate), employment status (full, part-time, retired, other), annual family income (less than $20,000, $20,000-$40,000, $41,000 - $70,000, more than $70,000), urban residence, health insurance coverage (none, private, public, both). Respondents who self-identified as either “white of Hispanic origin” or “black of Hispanic origin” (Latino, Mexican, Central or South American, or any other Hispanic origin) were classified as Hispanic. Respondents who self-identified as “black, not of Hispanic origin” were categorized as black. Respondents’ height and weight were obtained to calculate a body mass index (BMI), used as a log in analysis, and respondents were also asked whether they had ever been told by a doctor or other health professional that they had hypertension, diabetes or a heart problem.

Data Analysis

The propensity score (PS) method was used to estimate the effect of risky drinking and AUD on service utilization, adjusting for potential selection bias caused by various potentially confounding covariates. The PS is normally estimated as the predicted probability of treatment or exposure. Rosenbaum and Rubin showed that at a given PS, the conditional distribution of confounders is independent from the treatment/exposure assignment, and the PS adjustment is thus sufficient to remove bias due to all observed covariates (Rosenbaum and Rubin, 1983). Several PS approaches have been developed to study the causal association in observational data. Performed here is the PS weighting method (Robins et al., 2000) using “standardized mortality ratio” (SMR) weights, which assign a weight of 1 to the exposed group (risky drinkers or AUD positive) and the propensity odds (i.e. p/(1-p), where p is the predicted PS) to the comparison group. Compared to the popular PS matching approach (Rosenbaum and Rubin, 1985b), PS weighting has several advantages. First, while PS matching may be more intuitively interpreted as a quasi-randomized control study, bias can arise from incomplete matching (Rosenbaum and Rubin, 1985a). By contrast, the complete exposure group is used in PS weighting. Second, the PS weighting method allows PS weights to be combined with sampling weights of the population survey data (making the estimation population representative), by first running logistic regression predicting exposures weighted by

sampling weights to derive the PS and the SMR weights (described above). These weights are then multiplied by the sampling weights for the final PS weights. Note that the final PS weights for the exposed group (risky drinkers or AUD) were just their sample weights, while the non-exposed group was weighted to be comparable to the exposed group in terms of the potential confounding covariates. The sampling weights were constructed to account for the probability of selection (number of households, multiple phone lines, adult residents in households) and non-response. Post-stratification weights were also used to map sample respondents with the U.S. adult (18+) population proportions of ethnicity by region by age by gender groups, and within Hispanics by country of birth. As a check of whether balance was achieved between the exposed and control groups, we examined both tests between group means and the standardized differences, which is the percentage of difference in means of pooled standard deviations (Austin, 2008).

Data are analyzed on 13,165 respondents from both NASs and include abstainers. The exposed and non-exposed groups were first compared on various potential confounding covariates to examine the special characteristics of the risky drinking and AUD population. Comparison of covariate means was then performed using the final PS weights, which are expected to re-weight the non-exposed group to fully match the exposed group. We then compared the service utilization outcomes between groups before and after applying the PS weights.

RESULTS

Table 1 shows the prevalence of health service utilization before and after applying propensity score weighting between risky (n=2,254) and non-risky drinkers (n=10,111), excluding those with AUDs. Covariates used to construct the propensity score are listed in the top section of the table. As seen in the first two columns of the table, significant differences were evident for all of the potentially confounding variables except part-time employment, but after applying PS weights the risky and non-risky drinker groups were similar on all of these potential confounders, based on both significant tests and the standardized differences. While non-risky drinkers reported a larger number of ER visits and days of hospitalization during the last year, once the sample had been re-weighted, no significant differences were found between risk and non-risky drinkers on any of the utilization variables in the last year, with 11% reporting an ER visit, a third reporting a primary care visit, and 6.2-7.6% reporting hospitalization.

Table 2 shows the prevalence of health service utilization before and after applying propensity score weighting between those with an AUD (800) compared to those without (n=12,365). Significant differences were found between those with and without an AUD in gender, race/ethnicity, age education, income and urbanicity. While those with an AUD appeared to be healthier (in relation to a history of hypertension, heart problems or diabetes) than those without, using PS weighting they were more likely to report an ER visit in the last year (18.2% vs.11.6%) as well as a greater number of such visits, and also to report more primary care visits and any hospitalization (11.2% vs.6.7%) during the last year.

Several sensitivity analyses were performed to check the robustness of the findings. To account for the potential drawback of the propensity score weighting approach in which extreme weights may cause biased estimates and inflate sampling variance, the weights were trimmed to fall between the 2.5th percentile and the 97.5th percentile for the control group (Little et al., 1997). Results were essentially the same after the weights were trimmed. In addition, the continuous outcomes (i.e. number of visits for ER, primary care, hospital days and total service) are highly skewed with the majority of the sample reporting zero times, and log-transformation as shown in the tables cannot fully adjust for the non-normality. Geometric means were also examined with similar results; i.e., after propensity score weighting, significant differences were found between the AUD and control sample for all four outcomes, while none of the outcomes were significantly different between the risky drinking and control sample.

DISCUSSION

General population data from these two national surveys found, when demographic and socio-economic characteristics as well as measures of prior medical problems were taken into account, those drinking at risky levels were not heavier users of either inpatient or outpatient health services, while those with an AUD were significantly more likely to be heavier users of the emergency room and primary care and also to be more likely to be hospitalized. Interestingly, those with an AUD appeared to be healthier than those without, in relation to a history of hypertension, heart problems or diabetes, and may be due to the "sick quitter" effect in which individuals who develop chronic disease conditions quit or dramatically reduce their drinking (Liang et al., 2010; Rehm et al., 2008).

Analysis of the association of risky drinking, problem drinking and dependence with health services utilization in the general population in the 2005 NAS found problem drinking (measure by consequences items similar to those measuring abuse in the present study) was predictive of ER use, while alcohol dependence was predictive of primary care use (Cherpitel and Ye, 2008), and risky drinking predicted neither primary care or ER use. These findings are similar to those here. Data from the 2000 NAS found no association between problem drinking or dependence and either ER or primary care services utilization (Cherpitel, 2003), however, the 2000 NAS problem drinking category may have also included some who were alcohol dependent, and only gender, race/ethnicity and health insurances were taken into account, while the 2005 problem drinking category excluded all of those who were dependent.

This study overcomes limitations of previous studies by using propensity score weighting across a large set of demographic, socio-economic and health condition variables which have been thought to account for differences in health services utilization, and suggest that observed differences in increased utilization among those with an AUD are likely due to conditions associated with their drinking. Those with AUD may be incurring more health problems related to their alcohol use which require immediate treatment in the ER or hospitalization, as well as more ongoing attention in the primary care setting, compared to those not meeting AUD criteria.

A limitation of the study is that the covariates adjusted in the propensity score analysis may not include all potential confounders of the pathway between risky drinking, AUD and service utilization. Using the cross-sectional surveys in our analysis, temporality is also assumed rather than guaranteed. For example, while chronic disease may lead to abstention (the sick quitter effect), it can be the result of risky drinking as well. In the current analysis, these disease variables are treated as confounders rather than mediators between the risky drinking/AUD and service use association, because negative relationships between risky drinking/AUD and disease were observed. This negative association justified the assumption of a sick quitter effect rather than disease functioning as a mediator in which a positive relationship between risky drinking/AUD and disease would be found. In sum, while propensity score weighting analysis performed here was effective in balancing the exposed and non-exposed groups in terms of commonly observed confounders, causal effect cannot be established.

Another potential limitation of the study is that the data are based on self-reports and recall of health services utilization over the last year, rather than obtained from medical records or insurance claims, and while being reasonably valid for ER visits and hospitalizations, may not be as reliable for the number of primary care visits.

Nevertheless, these data suggest a significant and potentially costly increase in health services utilization due to AUD and associated burden placed on the health care system, not just in relation to of any use of services but to more visits made to the ER and to primary care settings. These findings lend additional support to the potential of the ER as well as primary care as important settings for identifying those who might benefit from identification and/or brief intervention and referral for treatment for alcohol problems, effecting a reduction in future services utilization and associated costs. Relatedly, ERs and primary care settings would benefit from devoting increased resources to addressing AUD, which could result in clinical benefits of improvement in overall health status as well as economic benefits in lowering health care costs for both patients and society as a whole.

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Table 1

Service utilization and all covariates before and after PS weighting between risky drinkers (N=2,254) and non-risky drinkers (N=10,111), excluding those with AUD

	Before PS weighting				After PS weighting			
	Risky Drinking	**Non-risky Drinking**	**P**	**Standardized difference**	**Risky Drinking**	**Non-risky Drinking**	**P**	**Standardized difference**
Sex: Male	0.54	0.44	<0.001	0.195	0.54	0.54	0.831	0.007
Ethnicity: White	0.80	0.67	<0.001	0.290	0.80	0.79	0.957	0.002
Black	0.05	0.13	<0.001	0.270	0.05	0.05	0.843	0.005
Hispanics	0.10	0.13	0.001	0.089	0.10	0.10	0.932	0.002
Others	0.05	0.07	0.016	0.092	0.05	0.05	0.974	0.001
Age: 18-29	0.24	0.16	<0.001	0.202	0.24	0.23	0.861	0.007
30-49	0.48	0.36	<0.001	0.243	0.48	0.48	0.868	0.006
>50	0.27	0.46	<0.001	0.391	0.27	0.27	0.850	0.006
Education: < HS grad	0.08	0.14	<0.001	0.201	0.08	0.08	0.756	0.011
HS grad	0.22	0.31	<0.001	0.204	0.22	0.22	0.863	0.006
Some college	0.30	0.26	0.003	0.100	0.30	0.30	0.981	0.001
College grad	0.39	0.28	<0.001	0.227	0.39	0.39	0.931	0.003
Employment: Full time	0.61	0.43	<0.001	0.358	0.61	0.61	0.919	0.004
Part time	0.11	0.12	0.579	0.019	0.11	0.11	0.872	0.006
Retired	0.08	0.20	<0.001	0.337	0.08	0.08	0.946	0.002
Other employ status	0.20	0.25	<0.001	0.135	0.20	0.20	0.935	0.003
Marital: Married/cohabit	0.68	0.63	0.001	0.104	0.68	0.68	0.701	0.014
Separate/divorce/widow	0.10	0.16	<0.001	0.170	0.10	0.10	0.829	0.006
Never married	0.18	0.15	0.056	0.069	0.18	0.18	0.844	0.008
Family income: <$20k	0.13	0.22	<0.001	0.236	0.13	0.13	0.942	0.002
$20-40k	0.17	0.20	0.004	0.088	0.17	0.17	0.916	0.003
$40-70k	0.29	0.25	0.002	0.098	0.29	0.29	0.814	0.008
>$70k	0.31	0.18	<0.001	0.322	0.31	0.31	0.998	0.000
Missing	0.10	0.16	<0.001	0.170	0.10	0.10	0.879	0.005
Urbanicity: Urban	0.82	0.78	0.002	0.095	0.82	0.82	0.871	0.005
Health insurance: None	0.11	0.14	0.001	0.099	0.11	0.11	0.998	0.000
Private	0.74	0.56	<0.001	0.384	0.74	0.73	0.653	0.015
Public	0.10	0.19	<0.001	0.260	0.10	0.10	0.946	0.002
Both private and public	0.04	0.08	<0.001	0.185	0.04	0.04	0.780	0.007
Body Mass Index (log)[1]	3.27	3.29	0.003	0.096	3.27	3.27	0.825	0.001
Ever hypertension	0.21	0.32	<0.001	0.264	0.21	0.21	0.985	0.000
Ever heart problem	0.07	0.13	<0.001	0.207	0.07	0.07	0.848	0.006
Ever diabetes	0.05	0.12	<0.001	0.247	0.05	0.05	0.885	0.005
ER visit: Any visit last year	11.56%	12.57%	0.364		11.56%	11.02%	0.644	
# of visits (log) [1]	0.10	0.12	0.033		0.10	0.10	0.618	

	Before PS weighting				After PS weighting			
	Risky Drinking	**Non-risky Drinking**	**P**	**Standardized difference**	**Risky Drinking**	**Non-risky Drinking**	**P**	**Standardized difference**
Primary care: Any last year	34.08%	32.00%	0.172		34.08%	33.15%	0.582	
# of visits (log) [1]	0.44	0.46	0.395		0.44	0.44	0.998	
Hospitalization: Any last year	7.59%	7.97%	0.673		7.59%	6.20%	0.139	
# of hospital days (log) [1]	0.10	0.13	0.008		0.10	0.09	0.585	
# of total service (log) [1]	0.57	0.57	0.790		0.57	0.57	0.966	

[1]Transformed by natural log to adjust for skewed distribution. Number of visits was added by one first before log-transformation.

Table 2

Service utilization and all covariates before and after PS weighting between DSM-5 positive (N=800) and negative (N=12,365)

	Before PS weighting				After PS weighting			
	DSM-5 Positive	**DSM-5 Negative**	**P**	**Standardized difference**	**DSM-5 Positive**	**DSM-5 Negative**	**P**	**Standardized Difference**
Sex: Male	0.68	0.47	<0.001	0.450	0.68	0.68	0.967	0.002
Ethnicity: White	0.67	0.70	0.235	0.061	0.67	0.67	0.978	0.002
Black	0.12	0.11	0.611	0.025	0.12	0.12	0.850	0.010
Hispanics	0.15	0.13	0.187	0.060	0.15	0.14	0.945	0.003
Others	0.07	0.07	0.995	0.000	0.07	0.06	0.935	0.005
Age: 18-29	0.48	0.17	<0.001	0.684	0.48	0.48	0.963	0.003
30-49	0.40	0.39	0.728	0.018	0.40	0.39	0.950	0.003
>50	0.11	0.42	<0.001	0.724	0.11	0.12	0.703	0.015
Education: < HS grad	0.12	0.13	0.745	0.018	0.12	0.12	0.904	0.007
HS grad	0.30	0.29	0.742	0.018	0.30	0.30	0.881	0.009
Some college	0.31	0.27	0.078	0.096	0.31	0.31	0.915	0.006
College grad	0.26	0.31	0.019	0.112	0.26	0.27	0.708	0.019
Employment: Full time	0.55	0.47	0.002	0.163	0.55	0.56	0.916	0.006
Part time	0.17	0.11	0.013	0.147	0.17	0.17	0.983	0.001
Retired	0.02	0.17	<0.001	0.514	0.02	0.02	0.994	0.000
Other employ status	0.26	0.24	0.545	0.035	0.26	0.25	0.920	0.006
Marital: Married/cohabit	0.46	0.64	<0.001	0.370	0.46	0.46	0.925	0.005
Separate/divorce/widow	0.09	0.15	<0.001	0.181	0.09	0.09	0.859	0.009
Never married	0.39	0.16	<0.001	0.542	0.39	0.39	0.980	0.001
Family income: <$20k	0.22	0.20	0.352	0.050	0.22	0.22	0.987	0.001
$20-40k	0.22	0.19	0.296	0.056	0.22	0.22	0.990	0.001
$40-70k	0.26	0.26	0.807	0.013	0.26	0.26	0.969	0.002
>$70k	0.19	0.21	0.521	0.033	0.19	0.20	0.879	0.008
Missing	0.11	0.14	0.052	0.106	0.11	0.11	0.873	0.010
Urbanicity: Urban	0.80	0.79	0.396	0.045	0.80	0.80	0.972	0.002
Health insurance: None	0.21	0.13	<0.001	0.208	0.21	0.22	0.910	0.006
Private	0.63	0.60	0.205	0.067	0.63	0.64	0.829	0.013
Public	0.10	0.17	<0.001	0.227	0.10	0.10	0.910	0.006
Both private and public	0.02	0.07	<0.001	0.256	0.02	0.02	0.921	0.004
Body Mass Index (log)[1]	3.26	3.29	0.042	0.110	3.26	3.26	0.949	0.001
Ever hypertension	0.20	0.30	<0.001	0.224	0.20	0.20	0.938	0.004
Ever heart problem	0.06	0.12	<0.001	0.202	0.06	0.06	0.993	0.001
Ever diabetes	0.04	0.10	<0.001	0.243	0.04	0.04	0.909	0.006
ER visit: Any visit last year	18.24%	12.34%	0.004		18.24%	11.64%	0.003	
# of visits (log) [1]	0.17	0.12	0.011		0.17	0.11	0.007	

	Before PS weighting				After PS weighting			
	DSM-5 Positive	**DSM-5 Negative**	**P**	**Standardized difference**	**DSM-5 Positive**	**DSM-5 Negative**	**P**	**Standardized Difference**
Primary care: Any last year	31.85%	32.47%	0.802		31.85%	27.71%	0.114	
# of visits (log) [1]	0.45	0.46	0.763		0.45	0.37	0.050	
Hospitalization: Any last year	11.19%	7.89%	0.071		11.19%	6.65%	0.019	
# of hospital days (log) [1]	0.13	0.13	0.728		0.13	0.09	0.098	
# of total service (log) [1]	0.58	0.57	0.770		0.58	0.49	0.062	

[1]Transformed by natural log to adjust for skewed distribution. Number of visits was added by one first before log-transformation.