

EPIDEMIOLOGY

Patterns of Alcohol Consumption in the Thai Population: Results of the National Household Survey of 2007

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Abstract — **Aims:** The National Household Survey for Substance and Alcohol Use is a periodic survey of the Thai population with the aim of estimating the number of people who use licit and illicit substances. This paper reports the findings regarding alcohol consumption from the 2007 survey. **Methods:** A multistage sampling scheme was used. Provinces, districts, sub-districts, villages and households were randomly selected in sequence. All residents aged 12–65 years who had lived in their current household for >3 months were included. Altogether, 11,348 households and 26,633 respondents from 29 provinces were selected. A structured interview questionnaire, including information on pattern of alcohol consumption, Alcohol Use Disorder Identification Test (AUDIT) and consequences of drinking, was used. **Results:** Of Thais aged 12–65 years, 63% were abstainers (men—40.9% and women—81.5%). The prevalence of current drinkers (defined as individuals who drank at least 10 g of alcohol in 12 months before the survey) was 28.6% (men—48.4% and women—12.7%). Based on the AUDIT score, 6.7% of the Thai population could be classified as hazardous drinkers, 0.9% as harmful drinkers and 0.6% as probable alcohol dependents. The median drinking intensity was 50.8 g in men and 25.4 g in women. After adjusting for other variables, predictors of being hazardous–harmful or probably dependent drinkers included male gender, age groups of 20–24 and 25–44 years, not married and living in Bangkok. **Conclusion:** The present study highlights the gender and age differences in drinking patterns and drinking consequences in Thailand. These issues should be taken into consideration when planning preventive measures to reduce alcohol consumption and related problems.

INTRODUCTION

In Thailand, the production and sale of alcoholic beverages has been increasing since the approval of the national policy on liberalizing the production and distribution of alcohol in 1998 as well as the announcement of the alcohol administrative policy in 1999 (Ministry of Finance, 2001, 2003). Since that time, the government has eliminated the former production monopoly and, as a consequence, there has been a vast increase in the quantity of alcohol on the market. There has also been a rise in the number of alcohol-producing establishments located around the country, especially in the northern and northeastern regions where various agricultural products, the raw materials of alcohol production, are mostly grown.

Not only have alcohol production and sales increased, people's alcohol consumption has also increased. Data from the World Health Organization (WHO) Statistical Information System show that adult *per capita* alcohol consumption in the Thai population aged ≥ 15 years gradually increased from 7.5 L per year in 1990 to 7.7 L in 1998, and then further to 8.3 and 8.5 L in 1999 and 2001, respectively, which saw Thailand ranked at number 40 in the world statistics on *per capita* alcohol consumption in 2001. As in other countries in the Southeast Asian and Western Pacific regions, this shows a recent and continuing increase in alcohol consumption. In contrast, countries in the European Region, the African Region and the Region of the Americas all reached their highest consumption in the early 1980s, and the consumption in these countries is now decreasing (World Health Organization, 2004).

Along with the increased demand and supply, the alcohol-related impacts have also increased. In the analysis of burden

of illnesses in Thailand in 2004, it was found that alcohol dependence/harmful use contributed to the highest years lived in disabilities (YLD) of all illnesses among men (17.9% or 314,000 YLDs). In terms of disability-adjusted life years (DALY), alcohol dependence/harmful use ranked third after HIV and traffic accidents and was equal in rank to stroke (5.8% of all illnesses or 332,000 DALYs) among men, making a substantial increase of burden when compared to the previous findings in 1999 where alcohol dependence/harmful use ranked 11th (International Health Policy Program, 2007).

In Thailand, an interest in and work concerning alcohol-related issues has grown substantially in the past decade. A greater comprehension and acceptance of alcohol-related issues by the general public in respect of the need to understand, prevent and control alcohol-related problems is now evident. Several regulations and laws controlling alcohol availability, similar to those now recommended in several countries (Room *et al.*, 2005), have recently been developed or amended in Thailand. These include, for example, increased taxation on certain kinds of alcoholic beverages (Cabinet Order, 6 September 2005), an alcohol advertisement ban, restricted hours for selling alcohol and the prohibition of alcohol sales in educational venues and religious places (Alcoholic Beverage Control Laws, 2008). The influence of these measures on alcohol consumption can only be assessed through national surveys.

Due to the seriousness of alcohol-related problems and the need to conduct research in order to understand the magnitude and nature of the problems, the National Household Survey on Substance and Alcohol Use (NHSSA) was initiated. The NHSSA is a series of periodic surveys that was first carried out in 2001 and 2003, then in 2007 and 2008, and

with plans to continue every 2–3 years. The major aim of the surveys is to estimate the number, prevalence and characteristics of people who use licit and illicit substances as well as alcohol and tobacco. The 2001 and 2003 surveys were more focused with the estimation of the number of illicit substance users, so questions about patterns of alcohol consumption were limited. In the 2007 survey, the questionnaire part on alcohol consumption was changed from that used in the 2001 and 2003 surveys to include more details about patterns of alcohol consumption and alcohol-use disorders, which laid the basis for the questionnaire used in the subsequent surveys. The present study provides prevalence, patterns and correlates of alcohol consumption in Thailand, using data provided by the 2007 survey. (There is a 2008 survey now available, but we did not use that data for this paper since the 2008 survey was carried out with the main purpose of testing the survey methodology rather than obtaining data, so the sample size was decreased to half of that in the 2007 survey. In addition, only limited questions on alcohol consumption were included.)

METHODS

Sample

The 2007 NHSSA was based on a Thai representative sample as described elsewhere (Assanangkornchai *et al.*, 2009b). The survey used a multistage sampling scheme. The country was divided into Bangkok and municipal and non-municipal areas outside Bangkok, which were subsequently divided into 10 administrative areas. Provinces, districts, sub-districts and villages or town blocks were then randomly selected in sequence, using probability sampling proportional to size. The final sampling unit was the household. All residents aged 12–65 years who had lived in their current household for >3 months were selected.

Altogether, 29 out of 76 provinces were selected with a final sample of 11,348 households, 2744 in a municipal area and 7356 in a non-municipal area. The number of respondents was 26,633, which accounted for 0.7% of the total Thai population aged 12–65 years in 2007 (Table 1). The survey response rate was 84.6%.

The study was approved by the ethics committees for research in human subjects of the regional university of each selected region. All respondents gave their informed consent to participate in the study.

Measurements

The field data collection methods were as described in detail elsewhere (Assanangkornchai *et al.*, 2009b). Briefly, two questionnaires were used. The first questionnaire was used for interviewing the head of the household about household characteristics and the second questionnaire was used for each eligible household member. The individual questionnaire comprised sections on the respondent's demographic characteristics, general health status, knowledge, attitude and experiences of drug and substance use, alcohol consumption, experiences of treatment for alcohol and substance-related problems, and experiences of arrest or imprisonment. All questionnaires were completed through face-to-face interviews administered by a trained researcher. The confidentiality of all respondents was strictly maintained.

Table 1. Characteristics of the respondents

Characteristic	% ^a	Total number
Sex:		
Male	44.6	11,983
Female	55.4	14,650
Age:		
12–19 years	15.4	4241
20–24 years	6.9	2139
25–44 years	40.3	10,727
45–65 years	37.5	9526
Religion:		
Buddhist	91.2	24,883
Other	8.8	1750
Education:		
Less than high school	55.7	13,493
High school	26.4	7498
Some college or higher	17.8	5642
Marital status:		
Married	64.0	16,447
Single/separated/widowed/divorced	36.0	10,186
Occupation:		
Unemployed	5.0	1448
Student	14.7	4240
Unskilled work	28.8	8342
Skilled work	38.9	8200
Office work/executive	12.6	4403
Location:		
Municipal	29.2	8497
Non-municipal	70.8	18,136
Region:		
Bangkok	9.2	2084
Central	24.0	9329
North	18.8	4654
Northeast	34.7	7404
South	13.2	3162

^aBased on weighted data.

There were three sub-sections in the alcohol section of the individual questionnaire, namely patterns of alcohol consumption, an Alcohol Use Disorder Identification Test (AUDIT) (Saunders *et al.*, 1993) and consequences of drinking. In the patterns of consumption sub-section, the first question was whether the respondent had ever drunk alcohol in their lifetime (excluding one to two sips for tasting). If the answer was in the affirmative, the interview would go on to the details of his/her consumption experience, including age at first drinking; experiences of drinking various types of alcoholic beverages in lifetime, past 12 months and 30 days; quantity and frequency of drinking in the past 12 months; and place, occasion and company of drinking. A modified tri-level method was used to elicit data on quantity and frequency of consumption (Assanangkornchai *et al.*, 2000; Saunders and Aasland, 1987). The respondent was first asked if he/she usually drank the same amount of alcohol most of the time when he/she drank. If the answer was in the affirmative, the quantity of all kinds of alcoholic beverage in a day of drinking and the frequency of drinking in a year were asked. If the respondent answered in the negative, then he/she was asked about the amount of alcohol consumed in each of his/her high-, medium- and low-level drinking days. The respondents were asked to report the beverage-specific amount of intake in a unit of container familiar to them, e.g. cup, glass, can or bottle. Pictures of various kinds of popular alcoholic beverages in Thailand and sizes and shapes of containers were shown to the respondents

to help them provide an accurate volume of intake. In the few cases in which the interviewer was shown or had described an unfamiliar type of alcohol or container, a sample of that alcohol or container was sent to the research coordination team for identification of the beverage, alcohol content and/or container amount. The frequency of drinking in a year was categorized into 10 levels, namely everyday, 5–6 days/week, 3–4 days/week, 1–2 days/week, 2–3 days/month, once a month, 7–11 days, 4–6 days, 2–3 days and once in the past 12 months (World Health Organization, 2000).

The second alcohol sub-section included 10 questions from the Thai version of the AUDIT. Each item was scored on a 0–4 scale, making the possible range of scores 0–40. The Thai AUDIT was translated from the original WHO version, modified and tested in a previous study in a southern community population (Assanangkornchai *et al.*, 2003) and has been used in several studies in Thailand (see for example Jirapramukpitak *et al.*, 2008). The AUDIT score was then used to classify the respondents into four groups as suggested by Babor and colleagues (Babor *et al.*, 2001), namely 0–7 = non-drinker or low-level problem drinker; 8–15 = hazardous or moderate-level problem drinker; 16–19 harmful or high-level problem drinker; and ≥ 20 = very high risk or probably dependent drinker.

The last sub-section comprised 14 questions about the consequences of drinking on the respondent's marriage or intimate relationship, family relationship, work, health and finance.

Statistical analysis

The study sample was weighted to adjust for the probabilities of multistage sampling selections. The primary sampling unit was the province and the final unit the household. The sampling probability at each stage was calculated from the number of people in the selected unit divided by the total number of people in the higher stage of sampling. For example, the probability of sampling people in a household was calculated from the number of people in the selected household divided by the number of people in all of the households in the town block or village in which the household was located. The total number of units (households, town blocks/villages, sub-districts, districts and provinces), total population at each stage and sampling probability were used to calculate the extrapolated number of drinkers from the number of drinkers obtained from the survey. The weighted sex- and age-specific prevalence of each type of drinker was calculated from the estimated number of drinkers of that type and the total population in that particular sex and age group.

Age was categorized into four groups: 12–19, 20–24, 25–44 and 45–65 years. In the new Alcoholic Beverage Control Laws in Thailand (Alcoholic Beverage Control Laws, 2008), the legal age for purchasing alcohol was raised from 18 to 20 years; thus, the age group of 12–19 was classified separately in this study to represent underage drinking. Adjusted odds ratios and 95% confidence intervals were calculated from multiple logistic regression models to examine associations between hazardous–harmful drinking or probable alcohol dependence, as classified by an AUDIT score ≥ 8 , and socio-demographic variables.

The amount of alcohol consumed was calculated by multiplying the total volume consumed with the concentration of alcohol in each different type of beverage and the specific

gravity of alcohol (0.793). The size of the container reported by the drinker was converted into a standardized volume. The estimated average alcohol concentrations of the various beverages were assumed as follows: fruit cocktails/alcopops = 3%, wine and home brewed alcohol = 13%, beer = 5% and whiskey/brandy/white spirits/herbal spirits = 40%. The total amount consumed during a person's single drinking session was calculated by summing all types of beverages consumed. The amount of alcohol consumed at each of the three levels of consumption was then multiplied by the number of days of drinking at that level in the past 12 months. The total consumption in the past year was calculated by summing the consumptions at high-, medium- and low-level drinking days. Drinking indices, such as average daily intake (total amount consumed in a year divided by 365), drinking intensity (total amount consumed in a year divided by number of drinking days) and frequency of drinking, were also calculated. Drinking status was categorized into four levels based on drinking intensity, using the WHO recommended cut points: none–low risk = drinking <40 g/drinking day in men, <20 g/drinking day in women and men aged <20 years; moderate risk = drinking 41–60 g/drinking day in men, 21–40 g/drinking day in women and men aged <20 years; high risk = drinking 61–100 g/drinking day in men, 41–60 g/drinking day in women and men aged <20 years; and very high risk = drinking >100 g/drinking day in men, >60 g/drinking day in women and men aged <20 years (World Health Organization, 2000).

RESULTS

Prevalence of drinkers by age and gender

Of the Thai population aged 12–65 years in 2007, 63% were lifetime abstainers (defined as individuals who had never drank more than one to two sips of alcohol in his/her lifetime), 7.9% were former drinkers (defined as individuals who had stopped drinking >12 months prior to the survey) and 28.6% were current drinkers (defined as individuals who had drank at least 10 g of alcohol in the 12 months prior to the survey). The highest proportion of abstainers was seen in the 12–19-year age group while the rates of current drinking were highest among respondents in the 20–24- and 25–44-year age groups. However, men were more likely to be current drinkers than were women of the same age group (Table 2).

Extrapolated nationwide, among 46.3 million Thais aged 12–65 years, 16.9 million were lifetime drinkers (12.2 million men—59.2% and 4.7 million women—18.7%). The numbers of 12-month and 30-day drinkers were 10 and 8.5 million in men and 3.2 and 2.0 million in women, respectively.

Prevalence of alcohol-use disorders based on AUDIT scores

Based on the AUDIT scores, 6.7% of the Thai population aged 12–65 years could be classified as moderate-level problem or hazardous drinkers, 0.9% as high-level problem or harmful drinkers and 0.6% as very severe-level problem drinkers or probable alcohol dependents. The prevalence of harmful drinking or probable alcohol dependence was highest among men aged 25–44 years. Among women, the prevalence of harmful drinking or probable alcohol dependence was <0.5% in all age groups (Table 2). Extrapolated nationwide, the numbers of hazardous drinkers, harmful drinkers and alco-

Table 2. Prevalence of alcohol consumption, alcohol-use disorders and some drinking indices by age and gender

Index	Men					Women				
	12–19 years	20–24 years	25–44 years	45–65 years	Total	12–19 years	20–24 years	25–44 years	45–65 years	Total
Prevalence of alcohol consumption among the total population (%) ^a										
Lifetime abstainer ^c	79.8	37.0	32.4	34.0	40.9	91.1	77.3	78.0	82.4	81.5
Former drinker ^c	2.3	3.5	9.1	17.2	10.7	1.6	6.9	6.4	6.6	5.8
Current drinker ^c	17.9	59.5	58.5	48.8	48.4	7.3	15.8	15.6	11.0	12.7
Prevalence of alcohol-use disorders among the total population classified by AUDIT scores (%) ^a										
Non-drinking	82.2	40.6	42.2	51.4	51.9	92.8	84.6	84.7	89.2	87.7
Low-risk drinking (1–7)	11.7	39.3	36.0	33.9	31.6	6.0	12.9	13.8	9.4	10.9
Hazardous drinking (8–15)	4.7	17.1	17.7	12.1	13.5	0.9	1.9	1.2	1.1	1.2
Harmful drinking (16–19)	0.8	1.7	2.5	1.7	1.9	0.2	0.2	0.2	0.2	0.2
Probable dependence (≥20)	0.5	1.3	1.6	0.9	1.1	0.03	0.4	0.1	0.08	0.1
Quantity of alcohol consumption among current drinkers (median) ^b										
Average daily intake (g/day)	6.8	9.1	11.9	8.8	10.1	0.6	1.7	1.3	1.9	1.3
Intensity (g/drinking day)	52.3	54.4	52.5	47.6	50.7	29.1	31.0	25.4	24.9	25.4
Frequency of drinking among current drinkers (%) ^b										
<1 day/month	30.8	20.7	17.8	20.1	19.7	72.7	60.0	54.0	45.2	53.4
2–3 days/month	24.9	22.8	21.8	21.6	22.0	14.8	16.4	19.6	17.8	18.3
1–2 days/week	23.0	30.6	25.6	22.5	24.7	8.1	14.2	13.8	17.9	14.6
3–4 days/week	11.9	13.6	14.8	15.0	14.6	0.7	4.1	6.5	8.4	6.4
5–6 days/week	4.8	4.9	7.4	6.6	6.7	1.1	1.2	1.6	3.4	2.1
Everyday	4.6	7.4	12.6	14.2	12.3	2.6	4.1	4.5	7.3	5.2
Proportion of at-risk drinking among current drinkers based on drinking intensity ^d (%) ^b										
Low risk	18.1	38.5	37.0	39.6	37.0	35.5	33.7	38.0	44.1	39.4
Moderate	18.6	14.9	17.7	19.8	18.4	19.8	25.6	26.9	26.1	25.9
High	18.2	18.7	16.3	17.0	16.9	19.8	11.5	12.1	10.8	12.3
Very high	45.1	27.9	29.0	23.6	27.7	24.9	29.2	23.0	19.0	22.4

^aBased on weighted data of total sample.

^bBased on weighted data of current drinkers in the specific age group and gender. The percentages of all categories of the same variable may not total 100% because of some missing data.

^cLifetime abstainer is defined as a person who never drank more than one to two sips of alcohol in his/her lifetime.

^dNone–low risk = drinking <40 g/drinking day in men, <20 g/drinking day in women and men aged <20 years.

Former drinker is defined as a person who had stopped drinking >12 months prior to the survey.

Current drinker is defined as a person who drank at least 10 g in the past 12 months prior to the survey.

Moderate risk = drinking 41–60 g/drinking day in men, 21–40 g/drinking day in women and men aged <20 years.

High risk = drinking 61–100 g/drinking day in men, 41–60 g/drinking day in women and men aged <20 years.

Very high risk = drinking >100 g/drinking day in men, >60 g/drinking day in women and men aged <20 years.

hol dependents among men were 2.8, 0.4 and 0.2 million and among women were 0.3, 0.04 and 0.03 million, respectively.

The median values of the average daily intake for respondents with different levels of AUDIT score (1–7, 8–15, 16–19 and ≥20) were 5.4, 25.4, 77.3 and 94.9 g/day for men and 1.1, 16.3, 47.3 and 87.6 g/day for women, respectively. This shows congruence between the amount of consumption and the severity of alcohol-use disorders. People with higher AUDIT scores consumed a higher amount of alcohol per day than did those with lower scores.

Drinking patterns among current drinkers by age and gender

Among current drinkers, the median value of the average daily intake was about 10 g or one standard drink for men and less than half a standard drink for women, which is considered to be quite low. However, the median drinking intensity was five standard drinks in men and 2.5 standard drinks in a drinking day among women, which is considered to be quite high. There was no substantial difference across age groups. In both men and women, drinking frequency increased by age; the rate of drinking at least three days per week was highest among men and women aged 45–65 years. Using the WHO recommended cut points (World Health Organization, 2000), more than half of Thais in all age groups could be classified as drinking at the levels associated with moderate to very high risk (Table 2).

Contexts of drinking by gender and age group

Among both male and female adolescents and young adults, the highest percentages indicated drinking at a friend's house, followed by their own home. In contrast, older adults were more likely to report drinking at their own home. Significant differences ($P < 0.05$) between males and females were seen in the context of drinking at the workplace, parties, bars and restaurants. Higher percentages of males reported drinking at the workplace and bars, while women tended to drink at parties and restaurants more often than at other locations. The percentage of drinking alone increased significantly ($P < 0.05$) with age group (Table 3).

Prevalence of drinking-related consequences

Table 4 shows percentages of drinking-related consequences among current drinkers by age group and gender. Males tended to have higher percentages of all problems than females of the same age group. The three most common problems were similar among all male and female drinkers, namely the effect of drinking on work, study or employment opportunities; finances; and feeling guilt or remorse after drinking. However, the most frequent problem among male adolescents was getting into a fight while drinking (26.1%), while for female adolescents, feeling guilty or remorse after drinking (17.5%) was the main problem. Almost all drinkers

Table 3. Context of drinking among current drinkers by gender and age group

Context (%) ^a	Men				Women			
	12–19 years	20–24 years	25–44 years	45–65 years	12–19 years	20–24 years	25–44 years	45–65 years
Usual drinking place*								
In own home	26.7	27.8	39.0	40.9	30.2	30.4	35.4	42.4
At friend's or relative's house	47.7	39.8	25.9	19.6	39.6	30.3	18.2	14.9
At workplace	4.1	3.3	6.7	4.7	0.7	0.3	2.9	2.7
At party	8.2	7.1	11.5	16.9	15.0	10.1	28.2	31.7
At pub, bar	7.5	14.4	8.9	12.8	3.8	14.0	5.4	4.6
At restaurant	4.8	7.4	7.1	4.3	8.3	12.4	8.9	2.6
Drinking company*								
Alone	1.6	2.0	11.6	19.8	1.4	1.4	5.2	14.2
Friends/relatives/party	97.7	97.6	87.5	79.2	98.3	95.7	92.9	84.6

^aBased on weighted sample of current drinkers in the specific gender and age group.

The percentages of all categories of the same variable may not total 100% because of some missing data.

* $P < 0.05$, significant differences for the comparisons of the categories between genders of the same age group or between age groups of the same gender.

had had at least one drinking-related problem in the past 12 months prior to the survey.

Determinants of hazardous–harmful drinking

Table 5 shows the prevalence of hazardous–harmful drinking or probable alcohol dependence, classified by an AUDIT score ≥ 8 and its socio-demographic correlates. After adjusting for other variables, variables significantly associated with a higher risk of being a hazardous–harmful drinker or probable alcohol dependent included male gender, age groups of 20–24 and 25–44 years, being a Buddhist, not married and living in Bangkok. Gender was the strongest predictor of being a hazardous–harmful drinker or probable alcohol dependent, with males being 12.3 times more likely to become one than females. The prevalence of hazardous–harmful drinking or probable alcohol dependence in men was 16.5%, while for women it was 1.5%. Compared to people in Bangkok, Thais who lived in other regions of the country were 1.7–10 times less likely to be hazardous–harmful drinkers. The prevalence of hazardous–harmful drinking was lowest in the provinces included from the south of Thailand.

DISCUSSION

There have been few population-based surveys on alcohol consumption in Thailand, notable exceptions being the 'Survey of Smoking and Drinking Behaviours among Thai Population', conducted every 3–4 years by the National Statistics Office (NSO) (National Statistics Office, 2007), and 'Thai National Health Examination Survey', conducted every 4–5 years, which includes some data about alcohol consumption (Porapakkham and Boonyarattapun, 2006). Although we have noted earlier surveys, our study is the most recent survey on a national scale, providing the most comprehensive data about patterns of consumption, alcohol-use disorders and alcohol-related consequences in the Thai population. As stated above, the questionnaire part on alcohol consumption in this most recent comprehensive one we report on was entirely changed from that of the 2001 and 2003 surveys, as the 2007 survey put more emphasis on patterns of alcohol consumption and related problems than what had been done before; also, the sampling frame was different. The results of this study, therefore, cannot be directly compared to those obtained from the 2001 and 2003 surveys.

Table 4. Prevalence of drinking-related problems among current drinkers by age and gender

Problems with... (%) ^a	Men				Women			
	12–19 years	20–24 years	25–44 years	45–65 years	12–19 years	20–24 years	25–44 years	45–65 years
Marriage/intimate relationship	3.6	6.2	15.6	14.6	1.7	10.9	7.7	7.3
Relationships with family and children	11.0	9.6	14.9	13.7	6.3	8.8	8.6	7.6
Friendship or social life	10.4	9.3	7.2	5.6	3.9	1.2	3.4	2.4
Fighting while drinking	26.1	23.4	15.5	6.6	8.2	9.3	5.3	2.1
Law due to drunk driving	4.3	4.9	3.9	2.0	2.7		1.2	
Work, study or employment opportunity	18.2	18.6	15.8	13.9	9.8	11.2	5.7	3.5
Housework or chores around the house	10.3	10.5	12.1	12.0	4.2	7.9	6.9	5.6
Finances	19.1	24.1	20.7	15.1	14.4	14.1	10.6	7.6
Physical health	9.2	14.6	18.3	15.8	9.3	12.4	16.4	12.9
Feelings of guilt or remorse after drinking	18.6	23.0	21.3	15.7	17.5	13.8	13.9	11.3
Law because of drinking	2.2	3.3	2.5	1.5	1.2	1.3	1.1	0.3
Lost a job or nearly lost one	1.1	2.3	2.4	2.1	0.2	0.2	0.7	0.3
Spouse threatened to leave or left	2.1	4.3	9.8	8.3	1.3	2.0	3.0	2.8
Annoyed by people criticizing drinking	11.3	13.8	13.3	9.7	11.9	11.7	7.1	8.9
Having 1–2 problems	48.4	50.9	46.9	49.7	67.6	55.2	61.9	62.2
Having ≥ 3 problems	51.0	48.5	52.2	48.5	31.6	42.3	37.6	37.0

^aBased on weighted sample of current drinkers in the specific gender and age group. The percentages of all categories of the same variable may not total 100% because of some missing data.

Table 5. Prevalence and adjusted odds ratios of hazardous–harmful drinking by socio-demographic characteristics ($n = 26,633$)

Characteristic	Prevalence ^a (%)	Adjusted odds ratio ^b (95% confidence interval)
Sex:		
Female	1.5	1 (reference)
Male	16.5	12.2 (10.58, 14.14)
Age:		
12–19 years	3.4	1 (reference)
20–24 years	10.4	2.3 (1.73, 3.08)
25–44 years	10.3	2.1 (1.54, 2.77)
45–65 years	7.4	1.4 (1.00, 1.84)
Religion:		
Buddhist	7.7	1 (reference)
Other	4.1	0.7 (0.55, 0.92)
Education:		
Less than high school	6.9	1 (reference)
High school	7.6	1.0 (0.91, 1.18)
Some college or higher	8.2	0.9 (0.83, 1.12)
Marital status:		
Married	7.8	1 (reference)
Single/separated/ widowed/divorced	6.8	1.3 (1.12, 1.43)
Occupation:		
Unemployed	7.3	1 (reference)
Student	2.8	0.4(0.28, 0.56)
Unskilled work	7.6	1.2 (0.93, 1.48)
Skilled work	7.7	1.0 (0.80, 1.28)
Office work/executive	10.9	1.1 (0.90, 1.46)
Household area:		
Municipal	8.2	1 (reference)
Non-municipal	7.0	1.1 (1.01, 1.30)
Region:		
Bangkok	13.5	1 (reference)
Central	8.0	0.5 (0.38, 0.55)
North	8.9	0.6 (0.46, 0.68)
Northeast	6.3	0.3 (0.29, 0.43)
South	2.4	0.1 (0.09, 0.17)

^aBased on weighted data of total sample.

^bAdjusted by other variables in the model.

Prevalence

The percentage of male abstainers in Thailand (40.8%) is in the middle range of those reported from other low- and middle-income countries, for example 7.5% in Argentina and 22.4% in Mexico (low end); 40% in Brazil, 41.4% in Sri Lanka and 45% in Costa Rica (middle range); and 48.2% in Uganda, 51.3% in Nigeria and 67.1% in India (high end). However, the percentage of abstinence in Thai females (81.3%) is comparable to India (89.3%), Nigeria (89.6%) and Sri Lanka (92.9%) (Wilsnack *et al.*, 2005). Compared to other western countries, these percentages are much higher, for example 9% of men and 35% of women in Russia (Bobak *et al.*, 1999), and 10.6% among women in Australia (Berry *et al.*, 2007). The highest percentage of abstainers was seen in the adolescent age group (79.7 and 90.8% in men and women, respectively), probably because many individuals in this group had not yet started drinking. However, the rate of former drinkers was highest in the 45–65-year age group, which may indicate that when Thai people get older, they tend to abstain from drinking.

Our study demonstrates that in 2007, 16.9 million Thais (28.3%) aged 12–65 years had ever drunk alcohol at some time during their lives. This is comparable to the NSO survey among the Thai population aged ≥ 15 years (14.9 million people—29.3%) (National Statistics Office, 2007). Our study and the NSO study confirm that in Thailand, as in every other

culture studied, drinking alcohol is a behavior practiced by a greater number of males than females (Assanangkornchai *et al.*, 2007; Bingham *et al.*, 2005; Bobak *et al.*, 1999; Hao *et al.*, 2004; Johnston *et al.*, 2005; Marques-Vidal and Dias, 2005; Room and Selin, 2005). The current study also illustrates the association between some socio-demographic factors (e.g. male gender, young adult age group and unmarried status) and hazardous–harmful drinking. This is in keeping with previous literature that found higher rates of alcohol use and abuse among these socio-demographic groups (Kalaydjian *et al.*, 2009; Swendsen *et al.*, 2009).

In Thailand, there is a more tolerant attitude toward drinking by men; drinking is socially more restricted for women. However, a change in the patterns of drinking in women, reflected in the socio-cultural changes seen in our study, is that younger women today are tending to drink more than women from older generations. Our study found that the prevalence of current drinking, alcohol-use disorders and drinking intensity in women was higher in young adult age groups than in the older age groups. If this pattern continues, it will lead to a higher rate of female drinkers and a smaller male-to-female drinking ratio in the future. This pattern of more modern women drinking has also been found in Russia, North America and several countries in Europe (Simons-Morton *et al.*, 2009). This situation must be observed closely because if the drinking level in women approaches that of men, then the incidence rates of alcohol-related problems are likely to be higher than among men because of females' greater physiological sensitivity to the effects of alcohol (Ely *et al.*, 1999; Graham *et al.*, 1998). Nevertheless, this pattern of higher consumption among young women than among older ones should be interpreted with caution as this is only the finding from one-point cross-sectional data. We also found that drinkers drink less when they get older. It may be that younger women have always drunk more, and the older age groups reflect this decrease.

Drinking patterns and contexts

The amount of alcohol consumed on a single drinking occasion is an important determinant of acute alcohol-related harms such as injury, violence and unsafe sex, which can lead to unplanned pregnancy, STDs and HIV (Cherpitel, 2007; Henny *et al.*, 2007; Yan *et al.*, 2007), especially when the person is engaged in activities that require skill and involve risks, such as driving. The frequency of drinking is also important because the probability of an alcohol-related injury is greater for occasionally heavy drinkers compared with regular drinkers (Gruenewald *et al.*, 1996; Treno *et al.*, 1997). Our study found that the median drinking intensity was quite high in both men and women, and >60% of all drinkers drank on a level that could be classified as at-risk drinking. More of concern, we found that this occasionally heavy drinking pattern occurred mostly in the youngest age group. Thai underage drinkers tended to drink very high amounts of alcohol on a single drinking occasion but most of them tended to drink infrequently—less than once a week. Irrespective of the reason for this pattern, it is important to control this behavior. Underage drinking is associated with several behavioral problems, including substance and prescription drug misuse/abuse, intentional injury-related behaviors, risky sexual behaviors and suicidal behaviors (Assanangkornchai *et al.*, 2009a).

Our study found differences in drinking contexts between males and females and between youth and older adults. Women tended to drink at home and parties while men more frequently drank at bars, their workplace and at a friend's house. In Thailand, bars are considered a male venue and women who visit bars would do so only in the company of men. The woman's role as a housewife is still prominent in Thailand, so they tend to spend more time at home. In Thai society, drinking is also less acceptable for women and, as a consequence, many women would only drink when they are at home with their family. Furthermore, in our study, women tended to drink only occasionally unlike the men; therefore, if women do drink, then it is likely to be in the context of a party. The legal age limit for entering a bar, pub or entertainment venue in Thailand is 18 years, and purchasing alcohol is legally prohibited for youths aged <20 years. The percentage of youths aged 12–19 years who reported usually drinking in a bar or restaurant was thus less than that of the older adults. Also, their usual drinking mostly occurred in the context of someone's home, especially at a friend's home, and possibly without parental supervision.

Other age-related patterns were the trend towards increasing percentages of drinking alone and frequency of drinking with increasing age. Drinking alone is considered a behavior of regular drinkers and was found in a previous study to be associated with alcohol dependence (Assanangkornchai *et al.*, 2000). A higher rate of drinking problems occurred in people who drink alone compared to those who drink in social contexts (Gonzalez *et al.*, 2009). Consistent with another report (Chan *et al.*, 2007), our study found that the frequency of drinking increased with increasing age. These findings may suggest that elderly Thais tend to drink by themselves regularly at home.

Implications, strengths and limitations

Our study used a nationally representative sample with a high response rate, which permitted a valid extrapolation to the general Thai population. This provided reliable data on the magnitude of the alcohol-related problems of the country as well as age- and gender-specific norms of drinking patterns of the population. This allows the construction of a population-based normative feedback information, as was done in another study (Chan *et al.*, 2007), to be used in some feedback-based interventions such as brief intervention and motivational interviewing for the Thai population. The study not only provides general statistics related to alcohol consumption of the country but also illustrates the characteristics of drinkers and the contexts of drinking. This knowledge is also very important as it provides more precise targets for selective or indicative prevention efforts. As shown in this study, teenagers drank a high amount of alcohol per occasion and they usually drank outside their own home, either at a party or their friend's house. Fighting was their common problem while drinking. Drunk driving would be the major issue of concern in this group, and the intervention goal is to reduce the incidence of alcohol-related traffic injuries and group fighting for this population. In contrast, the elderly were found to drink by themselves at home regularly, and thus prevention measures for this group might focus on keeping them on a moderate-drinking scheme to prevent domestic injuries.

In our study, the measurement of the amount of alcohol intake was done carefully using the tri-level method and pictures of containers and drink sizes, resulting in a high internal validity. Seasonality has an effect on alcohol drinking in Thailand.

About 95% of the Thai population is Buddhist and many religious holidays are observed throughout the year, which promote abstinence from alcohol consumption. However, during the international New Year's period (late December–early January) and the Thai traditional New Year's period (middle of April), many people celebrate the festive activities by drinking a considerable amount of alcohol. The data collection in this study was organized to avoid these two periods, so that drinking patterns obtained from the respondents would reflect their usual patterns in general and normal daily life situation.

In doing this study, the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement was carefully complied with by checking all applicable items that should be included in reports of cross-sectional studies (ISPM University of Bern, 2009). However, the very nature of the study and the questionnaire meant that some questions required the recall of events that had occurred in the past, such as the amount and frequency of drinking in the previous 12 months. Also, despite careful measurement of alcohol consumption, the alcoholic content and the size of the containers of some alcoholic beverages included in this study, especially home brewed ones, varied from area to area. These two factors might have had an effect on the accuracy of the calculation of the quantity of alcohol consumed, but we believe such potential discrepancies would be minimal at best.

CONCLUSION

Our study provides national data on the patterns of alcohol consumption and the magnitude of alcohol-related problems among the Thai population aged 12–65 years. The results were similar to those of other studies worldwide. Men drank more and had higher rates of alcohol-use disorders and alcohol-related problems than women. However, the study found that modern Thai women are drinking more than women in earlier times. In addition, an occasionally heavy drinking pattern was found among youths. Finally, gender and age group differences in drinking patterns and drinking consequences were illustrated. All these issues should be taken into consideration when planning preventive measures in order to achieve the most benefit to the indicated groups. Research remains an essential tool in the understanding of patterns of drinking and related problems and forms the basis for prevention policies and planning and management of the problem.

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