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ALCOHOL AND VIOLENCE-RELATED INJURIES AMONG EMERGENCY ROOM PATIENTS IN AN INTERNATIONAL PERSPECTIVE

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Abstract

While alcohol has been found to be more closely associated with violence-related injury than with injury from other causes, little data is available which documents heterogeneity in this association across countries or cultures, taking into consideration usual drinking patterns and other socio-cultural variables. Data are reported from 15 countries comprising the Emergency Room Collaborative Alcohol Analysis Project and the WHO Collaborative Study on Alcohol and Injury. Case-crossover analysis was used to analyze the risk of injury (among current drinkers) from drinking six hours prior to the event, based on frequency of usual drinking, for violence-related injuries and separately for non-violence related injuries. Relative risk (RR) for a violence-related injury was significantly greater than for injuries from other causes across all countries (pooled RR=22.22 vs. 4.33), but the magnitude of risk varied considerably (ranging from 4.68 in Spain to 942 in Canada). Pooled effect size was found to be heterogeneous across countries, and was explained, in part, by the level of detrimental drinking pattern in a country. Risk for a violence-related injury was not significantly different by age (<30 and 30+), reporting 5 or more drinks on at least one occasion during the last year, or reporting symptoms of alcohol dependence. A number of methodological concerns suggest that risk of a violence-related injury compared to injuries from other causes may be inflated, and such variables as context of drinking should be taken into consideration in establishing relative risk and alcohol attributable fraction of violence-related injury across countries and cultures.

INTRODUCTION

Alcohol is a leading risk factor in the global burden of disease, and 12% of the alcohol-related disease burden is due to intentional injuries (Rehm et al., 2003b). In the 1999 National Hospital Administration Medical Care Survey, of approximately 27 million emergency department visits for injuries among those 18 years and older in the U.S., 1.37 million were due to assaults (McCaig and Burt, 2001). A strong association has been found between alcohol use and injuries resulting from violence, and much of the literature documenting this association has come from studies conducted in hospital emergency rooms where patients admitted with violence-related injuries are significantly more likely to have a positive blood alcohol concentration (BAC) and to report drinking prior to the event than patients sustaining injuries from other causes (Cherpitel, 2007). A case-control study of ER patients in the U.S. found an odds ratio of 10 for violence-related injuries, and among the same patients using case-crossover analysis, relative risks (RRs) of 34 and 10, depending on the control time period (Vinson et al., 2003a). A case-crossover study of ER patients from Mexico found a relative risk (RR) of 2.5 for unintentional injuries compared to 9.9 for violence-related injuries (Borges et al., 2004c),

and similar findings have been reported from other studies in the U.S. and Mexico, as well as elsewhere (Borges et al., 2004a; Borges et al., 1998; Borges et al., 2008; Cherpitel, 1994; Cherpitel, 1997). A study of ERs in ten countries comprising the World Health Organization (WHO) Collaborative Study on Alcohol and Injury, using case-crossover analysis based on drinking the week prior to injury, found a relative risk of 14 for violence-related injuries compared to 5.7 for all injuries combined, with a 40% increase in risk of violence-related injury for each additional drink consumed in the six hours prior to injury (Borges et al., 2006b). Gender differences in drinking and violence-related injuries among ER patients have also been explored in 15 countries, with a significantly greater association for men compared to women in some countries, but not in all (Wells et al., 2007). In this study heavy episodic drinking was found to predict violence-related injuries for women but not men in the U.S. and the authors conclude that treatment and prevention programs may need to target both genders equally, with a particular focus on heavy drinking women in the U.S.

Attributable risk of injury to drinking has also been found to be greater for violence-related injuries than for injuries from other causes in a six-country study, with 43% of violence-related injuries due to drinking in the six hours prior to the event and 27% related to a usual heavy drinking pattern, compared to 6% of injuries from other causes for both of these risk factors (Cherpitel et al., 2005a). While association does not necessarily imply causation, a recent study undertook to evaluate epidemiological criteria of causation (Rutter, 1996) as related to the alcohol-violence link across 30 ERs in six countries, and concluded, given the temporal sequencing of drinking and violence and the significance dose-response relationship observed, that alcohol is a likely cause of violence, although other environmental factors may play a role as well (Macdonald et al., 2005).

While alcohol has been found to be more closely associated with violence-related injury than with injury from other causes, little data is available which documents heterogeneity in this association across countries or cultures, taking into consideration usual drinking patterns and other socio-cultural variables. To fill this gap in the literature, data are reported from 15 countries comprising the Emergency Room Collaborative Alcohol Analysis Project (ERCAAP) and the WHO Collaborative Study on Alcohol and Injury. Case-crossover analysis is used to analyze the risk of injury (among current drinkers) from drinking six hours prior to the event, based on frequency of usual consumption, for violence-related injuries and separately for non-violence related injuries, by age and by heavy drinking pattern at the individual and societal-level. These findings are important in light of the ongoing work on comparative risk assessment in the Global Burden of Disease and Injury, Injuries and Risk Factors Study, presently underway (Rehm et al., 2009) to establish the global burden of disease due to alcohol-related injury morbidity.

METHODS

Samples

Data were analyzed on 8,154 injured patients who were current drinkers in 15 countries comprising the Emergency Room Collaborative Alcohol Analysis Project (ERCAAP) (Cherpitel et al., 2003) and the World Health Organization (WHO) Collaborative Study on Alcohol and Injuries (WHO Collaborative Study Group, 2002).

The ERCAAP study (1984–2003) included 32 ER sites from 16 studies in seven countries, all of which used a similar methodology developed by Cherpitel (1989). Five of the studies included more than a single ER. The WHO project (2001–2002), also using the same methodology, included 12 ER sites in 12 countries. A listing of the ER studies and countries comprising both projects can be found in Cherpitel (2005b). Data in the WHO study included only those patients arriving at the ER within 6 hours of the injury event. To maintain

comparability, ERCAAP data analyzed here were selected to include only those injured patients also meeting this 6-hour criterion. Data in both projects were collected using a similar methodology and questionnaire (Cherpitel, 1989) which was translated and back translated into each language.

In both the ERCAAP and WHO projects, probability samples of patients 18 years and older were obtained by sampling consecutive arrivals to each ER in the study with equal representation of each shift for each day of the week. Studies where patients were disproportionately sampled were weighted to ensure that hours of the day and days of the week were equally represented within a study. Each patient was approached with an informed consent to participate in the study. Completion rates for the ERCAAP studies averaged 72%, while those for the WHO studies averaged 91%. Reasons for non-interviews included refusals, incapacitation, leaving prior to completing the interview, being in police custody, and language barriers. Patients who were too severely injured to be approached in the ER were followed into the hospital and interviewed once their condition had stabilized.

A cadre of interviewers trained at each site administered a 25-minute structured questionnaire that included among other items, those having to do with the cause of injury and whether violence was involved, drinking prior to the event, quantity and frequency of usual drinking including higher consumption times, symptoms of alcohol dependence, and demographic characteristics.

Measures

To obtain a measure of *drinking-in-the-event*, patients were asked if they had consumed any beverage containing alcohol (beer, wine or spirits), even one drink, within the six-hour period preceding injury.

Quantity and frequency of drinking were obtained from a series of questions used in previous U.S. National Alcohol Surveys (Clark and Hilton, 1991), as well as ED studies conducted in the U.S. and elsewhere (Cherpitel et al., 2003), and included the frequency of higher consumption times (12 or more drinks on an occasion and 5 to 11 drinks on an occasion during the last year). An *individual-level heavy drinking measure* was developed, based on these two questions, of 5 or more drinks on an occasion at least once in the last year.

A measure of *alcohol dependence* was obtained based on a series of questions regarding symptoms during the last year. In the WHO study and in six of the ERCAAP studies, alcohol dependence was based on the Rapid Alcohol Problems (RAPS4) screening instrument, developed from the optimal sub-set of items from several brief screening instruments in an ER population (Cherpitel, 1995; Cherpitel, 2000) and tested in other ER samples (Borges and Cherpitel, 2001; Cherpitel, 1998; Cherpitel and Bazargan, 2003; Cremonte and Cherpitel, 2008) where, with a cut point of one, it has been found to perform well against standard diagnostic criteria. The RAPS4 consists of the following four items: 1) During the last year have you had a feeling of guilt or remorse after drinking? (*Remorse*) 2) During the last year has a friend or family member ever told you about things you said or did while you were drinking that you could not remember? (*Amnesia*, also called blackouts) 3) During the last year have you failed to do what was normally expected from you because of drinking? (*Perform*) 4) Do you sometime take a drink in the morning when you first get up? (*Starter*, also called eye-opener). In the remaining ERCAAP studies in which only two of the RAPS4 items (*Amnesia* and *Starter*) were available, two other items thought to be related to similar diagnostic criteria for alcohol dependence were substituted: a) *hands shook a lot in the morning after drinking* and b) *stayed intoxicated for several days at a time*. In the six studies where both the RAPS4 and the two additional items were available, a similar prevalence of positive responses

(based on a positive response to any one item) was found when the two sets of items were compared (17.6% versus 16.3%, respectively).

Societal-level heavy drinking pattern was measured by the detrimental drinking pattern score, based on aggregate survey data as well as a survey of key informants selected by WHO, for each country (Rehm et al., 2001; Rehm et al., 2003a). This measure includes indicators of heavy drinking occasions, whether drinking mostly occurs with meals, and whether drinking frequently occurs in public places. Detrimental pattern scores range from 1 to 4, where the higher the score, the higher the postulated detrimental effect of the same per capita consumption of alcohol (Rehm et al., 2003a; Rehm et al., 2003b).

Data Analysis

Case-crossover analysis was used to estimate the risk of injury associated with drinking within the six hours prior to the event for violence-related and non-violence-related injuries using the usual frequency method of comparison (Maclure, 1991). Using this analytic strategy individuals serve as their own controls in studying the effect of a transient factor (alcohol consumption) on the risk of an acute event (injury), theoretically reducing confounding of the alcohol-injury relationship from stable risk factors such as gender and age, and allows for an estimate of risk over and above that associated with usual alcohol use.

The *observed* odds of exposure was derived by whether the patients had consumed alcohol within six hours prior to the injury. *Expected* exposure time (in hours) was calculated by multiplying the patients' self-reported usual frequency of drinking within the last 12 months by six hours, assuming the effect period of drinking is six hours. Expected unexposed time was then derived by subtracting the expected exposed time from the number of hours in one year less sleeping time which was set at six hours per 24-hour period (6,576 hours). The Mantel-Haenszel estimate of the relative risk was derived by dividing the sum of the total expected unexposed time of the observed exposed cases by the sum of the total expected exposed time of the unexposed cases.

After obtaining relative risk estimates for each country, meta-analysis with random effects was used to obtain a pooled RR across all countries, separately for violence-related and non-violence-related injury, and each tested for homogeneity (Sutton et al., 2000). Since pooled RR estimates were not found to be homogeneous for either violence-related injuries or injuries from other causes, meta-regression was used to examine the predictive ability of societal-level detrimental drinking pattern in explaining heterogeneity in relative risks across countries.

Variation in the magnitude of the RR across levels of fixed characteristics (age, 5+ drinks on occasion and alcohol dependence in the last year) was examined as possible effect modifiers for violence-related injury.

RESULTS

As seen in Table 1, relative risk for a violence-related injury was significantly greater than for injuries from other causes for each country, but the magnitude of difference varied considerably across countries. Relative risk estimates for violence-related injury also varied greatly from country-to-country, ranging from 4.68 in Spain to 942 in Canada (although the proportion of injuries which were violence-related in Canada was small, 7%, the vast majority, 87%, reported drinking prior to the event). Pooled RR was five times greater for violence-related injuries than for injuries from other causes (22.22 vs. 4.33), but was heterogeneous for both injury causes, and which was partly explained by the level of detrimental drinking pattern in a country. The greater the detrimental pattern level, the greater the relative risk of both violence-related

injuries and injuries from other causes associated with drinking within six hours prior to the event.

Although the difference in magnitude of violence-related injury varied greatly from country-to-country, risk was not significantly greater for those under 30 compared to those older (pooled effect size = 27.67 vs. 16.61), or for those reporting 5+ drinks on at least one occasion during the last year compared to those who did not (pooled effect size = 27.05 vs. 14.62), or for those reporting symptoms of alcohol dependence compared to those who did not (26.15 vs. 26.52).

DISCUSSION

Relative risk for a violence-related injury due to drinking prior to the event was found to be over five times greater than risk from drinking for injuries due to other causes. This is the first study examining the association of alcohol and violence-related injuries compared to injuries from other causes in the ER across a large number of countries of varying cultures, and is supported by findings from individual ER studies (Borges et al., 2004a; Borges et al., 2004c; Borges et al., 1998; Borges et al., 2008; Cherpitel, 1997; Vinson et al., 2003a) and reviews of the published literature (Cherpitel, 1994; Cherpitel, 2007). One ER study, which included 10 of the studies analyzed here, found the risk of violence-related injuries from drinking prior to the event was more than double the risk for all-cause injuries (Borges et al., 2006b). Since all-cause injuries also included violence-related injuries, however, the increased risk reported for violence-related injuries was a conservative estimate. A study of violence-related injuries in Mexico, Brazil and Argentina found a stronger dose-response relationship (higher levels of drinking associated with greater relative risk) for violence-related injuries compared to injuries from other causes (Borges et al., 2008). This suggests other mechanisms may be at play for violence-related injury, over and above those associated with impaired psycho-motor coordination. Alcohol reduces inhibitions and may lead to more aggressive behavior, and this couple with drinking in social settings, may lead to a violence-related event resulting in injury. This, however, does not necessarily explain how an individual's drinking is associated with being the victim of a violent encounter. Drinking in social situations certainly place an individual in close proximity with others who are drinking and who as a result, may perpetrate violence, and victims of violence who have been drinking may also have an impaired ability to move out of harm's way to avoid injury. Studies have generally not distinguished between perpetrators and victims of violence-related injury. Previous research has found that heavy drinkers are more likely to perpetrate violence, as well as to be the victims of violence, compared to those who do not drink, and the incidence of both violence perpetration and victimization has been found to increase as alcohol consumption increases (Norton and Morgan, 1989). Future research would benefit from this separation.

The magnitude of risk for violence-related injuries was found to vary considerably across countries, some of which was explained by the level of detrimental drinking pattern in a country. Detrimental drinking pattern reflects the extent to which alcohol is integrated in a society and the greater the pattern score, the less likely alcohol is used frequently in moderation (e.g., with meals), and the more likely it is used infrequently but heavily, such as weekend binge drinking episodes or fiesta drinking. This immoderate pattern of consumption predicted the positive association found for drinking prior to the event with both violence-related injuries and injuries from other causes.

Risk for a violence-related injury was not found to vary by age, or heavy drinking patterns. The case-crossover design is well suited to disentangle the effects of acute drinking (in the event) from chronic (usual drinking) patterns. Using this design current alcohol dependence has been found to be associated with violence-related injury elsewhere (Vinson et al., 2003a), although ED studies using the case-crossover design have reported conflicting findings across

all causes of injury, with some studies showing no elevated risk of injury for those alcohol dependent (Borges et al., 2004c), while other studies show a greater risk (Vinson et al., 2003b), and still others showing the reverse relationship, with alcohol dependence serving as a protective factor for risk of injury (Borges et al., 2004b; Borges et al., 2006b). A Swiss ER study found high volume drinkers to be at a lower risk of all-cause injury than low volume drinkers, suggesting that while all groups of drinkers were at increased risk for injury, those who usually drink little but on occasion drank heavily were at greater risk (Gmel et al., 2006), and this finding has been supported elsewhere, where those reporting 5 or more drinks on an occasion at least monthly were at lower risk of all-cause injury (Borges et al., 2006a). Tolerance to alcohol's effects may provide protection against of an alcohol-related injury, and this is an area requiring more research, especially for violence-related injury.

Although the case-crossover design reduces confounding of the alcohol-injury relationship from stable between-individual variables such as age, gender, socioeconomic status, etc., since each individual serves as his or her own control, it does not control for within-individual confounders, such as activities at the time of injury, which may be independently related to both drinking and injury and which may serve to inflated risk of injury related to violence. The specific activity in which the individual was engaged at the time of injury must be taken into account in order to identify person-time at risk of injury for determining exposure and control periods. This is particularly true for violence-related injuries which occur under circumstances involving interaction with at least one other individual, and if such interaction is, independently, correlated with alcohol use, then not controlling for this drinking-related social activity will result in an overestimate of RR of violence-related injury due to drinking. One study (Stockwell et al., 2002), specifically examined the possible confounding effect of environmental factors and activities, finding those that consumed alcohol were more likely to avoid high-injury-risk activities such as sporting and working, while settings and activities such as licensed premises and social activities were positively related to both drinking and injury. Thus, a specific cause of injury is highly related to the particular activity in which the individual is engaged at the time, and this must be taken into consideration in determining the risk of violence-related injury.

In addition to this “selection bias”, “recall bias” may also serve to overestimate the risk at which drinking places the individual for injury. Patients may be more likely to forget their drinking behavior, on a usual basis over the last year, compared to their drinking at a specific time immediately preceding a recent event resulting in an injury (which required ER treatment). Thus, recall bias results from under-reporting one's drinking for a previous period in terms of both likelihood of any drinking and the amount consumed, providing an underestimate of the likelihood of drinking prior to injury and biasing estimates of RR of a violence-related injury associated with drinking upward. A recent study found, using a 7-day follow-back measure, recall of alcohol consumption decreased with length of the recall period, a difference significant for sporadic drinkers (Gmel and Daeppen, 2007). Recall bias has also been found to be greater for lighter drinkers than for heavier drinkers (Greenfield and Kerr, 2008).

Additionally, alcohol consumption may tend to be over-reported in situations, such as violence-related injuries, in which alcohol may be used as an excuse for otherwise socially unacceptable behavior (MacAndrew and Edgerton, 1969), suggesting the need for additional research on eliciting valid self-reports across a variety of situations.

As true with all studies conducted in hospital emergency rooms, while patient samples in each country were selected to be representative of the clientele treated at the respective ER, these patients cannot be considered to be representative of those treated at other ERs in the region or country, nor are the selected ERs representative of others in the larger geographic area. These data also apply only to those injuries for which treatment was sought, and not to alcohol's

involvement in violence-related injuries which do not come to the attention of ER personnel. Lastly, differences in ER admission practices across countries affect the level of severity of injury of those admitted to the ER, and the relationship between alcohol and severity of injury is not clear and has been an issue of ongoing debate with mixed findings (Fabbri et al., 2001; Honkanen, 1993; Li et al., 1997).

According to the World Health Report (Murray and Lopez, 2002) a one-quarter reduction in alcohol use could result in approximately 15 million fewer disability-adjusted life years (DALYs) by 2010. Since injuries and especially those related to violence contribute significantly to DALYs, this reduction would have a major impact on the prevalence of alcohol-related injuries world-wide. Findings here suggest alcohol as an important risk factor in violence-related injuries among ER patients. This is especially important to consider in light of ongoing work to establish the global burden of disease due to alcohol for non-fatal injury (Rehm et al., 2009). Attributable-risk of alcohol to injury is highly important and much of this burden is avoidable. There are evidence-based interventions to reduce harm (Babor et al., 2003), consequently, many monitoring and surveillance systems include indicators of alcohol-attributable injury as core elements (World Health Organization, 2000) and efforts to improve these systems, called for by the World Health Assembly (2005). Findings here underscore the importance of these efforts globally.

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Table 1

RR of Violence and Non-Violence-Related Injury for drinking 6-hours

Countries	Violence-Related Injury					Non-Violence-Related Injury				
	Total N ^I	N	6-hr Alc	RR	p	Total N	N	6-hr Alc	RR	p
Argentina	85	49		12.06	<0.001	453	117		3.24	<0.001
Australia	66	42		19.13	<0.001	502	103		2.13	<0.001
Belarus	43	35		43.96	<0.001	359	102		8.53	<0.001
Brazil	34	16		9.39	<0.001	301	42		2.57	<0.001
Canada	31	27		942.41	0.002	416	53		2.09	<0.001
China	51	29		43.6	<0.001	158	69		25.47	<0.001
Czech Rep	16	5		6.82	0.027	408	32		0.8	0.248
India	71	60		30.22	<0.001	65	46		14.3	<0.001
Mexico	414	257		78.83	<0.001	1026	241		14.11	<0.001
Mozambique	69	31		13.19	<0.001	200	45		5.26	<0.001
Poland	49	31		16.46	0.012	360	30		1.61	0.012
South Africa	196	170		84.4	<0.001	84	61		43.19	<0.001
Spain	39	17		4.68	<0.001	798	166		1.49	<0.001
Sweden	30	18		35.81	<0.001	387	54		2.93	<0.001
US	286	156		12.7	<0.001	1157	222		2.41	<0.001
Test of homogeneity				P<0.001		P<0.001				
Pooled effect				22.22*		4.33				
				<0.001		<0.001				

Violence-related injury: lnRR predicted by DDP: B=0.50, se=0.20, p=0.014

Non-Violence-related injury: lnRR predicted by DDP: B=0.60, se=0.28, p=0.034

^I Current drinkers only

* p<.001 (t-test, comparison of pooled effect between violence-related and non-violence related injuries)

Table 2

RR of Violence for drinking 6-hours, by Age

Countries	Violence-Related Injury, Age < 30					Violence-Related Injury, Age ≥ 30				
	Total N ^I	N	6-hr Alc	RR	p	Total N	N	6-hr Alc	RR	p
Argentina	54	34		15.78	<0.001	30	14		6.9	<0.001
Australia	43	31		42.02	<0.001	23	11		7.14	<0.001
Belarus	25	20		49.46	<0.001	18	15		38.25	<0.001
Brazil	22	12		13.81	<0.001	11	4		4.93	0.024
Canada	16	15		1554	0.063	15	12		636.61	0.013
China	19	10		73.53	<0.001	32	19		34.38	<0.001
Czech Rep	9	3		12.18	0.114	7	2		4.39	0.150
India	29	24		31.02	<0.001	41	35		28.97	<0.001
Mexico	277	167		80.42	<0.001	137	90		75.9	<0.001
Mozambique	43	16		10.71	<0.001	26	15		17.42	<0.001
Poland	19	11		15.95	0.012	29	19		15.98	0.012
South Africa	120	99		80.85	<0.001	76	71		89.98	<0.001
Spain	23	12		8.77	<0.001	16	5		2.17	0.167
Sweden	11	10		1098.33	0.035	18	8		18.93	<0.001
US	157	87		17.44	<0.001	127	68		9.26	<0.001
Test of homogeneity	P<0.001									
Pooled effect	27.67 <0.001 16.61 <0.001									

^I Current drinkers only

Table 3

RR of Violence for drinking 6-hours, by Heavy drinking

Countries	Violence-Related Injury, 5+ at least once last year			Violence-Related Injury, No 5+ last year		
	Total N ^I	N 6-hr Alc	RR	Total N	N 6-hr Alc	RR
Argentina	57	40	11.97	28	9	12.45
Australia	55	37	20.12	11	5	14.06
Belarus	37	33	81.58	6	2	5.48
Brazil	19	12	13.39	14	3	3.64
Canada	25	24	2472.22	2	1	339.33
China	36	23	160.17	15	6	11.6
Czech Rep	10	4	10.59	6	1	3.37
India	44	41	36.72	27	19	21.97
Mexico	265	184	73.91	92	32	51.46
Mozambique	59	30	15.83	3	1	169.67
Poland	39	25	13.19	10	6	215.3
South Africa	164	149	85.9	32	21	75.64
Spain	10	8	12.6	29	9	2.97
Sweden	15	14	1145.42	13	2	4.38
US	192	123	12.37	86	30	16.77
Test of homogeneity			P<0.001			P<0.001
Pooled effect			27.05			14.62
			<0.001			<0.001

^I Current drinkers only

Table 4

RR of Violence for drinking 6-hours, by Alcohol Dependence

Countries	Violence-Related Injury, 1+ RAPS-4 ²			Violence-Related Injury, No RAPS-4 ²		
	Total N ¹	N 6-hr Alc	RR	Total N	N 6-hr Alc	RR
Argentina	30	19	7.63	54	29	18.35
Australia ³						
Belarus	29	26	64.59	14	9	23.81
Brazil	10	6	8.24	24	10	10.08
Canada	1	1	N.A.	0	0	N.A.
China	9	8	234.57	40	20	32.42
Czech Rep	7	5	36.5	9	0	0
India	49	43	62.23	22	17	13.35
Mexico	158	120	69.96	255	136	87.39
Mozambique	15	9	15.02	53	22	12.6
Poland	25	16	8.85	24	15	110.95
South Africa	130	120	84.36	66	50	84.48
Spain	5	5	N.A.	34	12	3.4
Sweden	17	13	47.17	13	5	22.19
US	114	81	13.16	163	71	13.56
Test of homogeneity ⁴	P<0.001			P<0.001		
Pooled effect ⁴	26.15			26.52		

¹ Current drinkers only

² 1 out of 4 Raps-4 items in WHO and 6 ERCAAP studies. For remaining ERCAAP studies, two RAPS-4 items and two substitute items are used.

³ Dependence scale was not complete

⁴ Test of homogeneity and pooled effect is based on 11 countries (excluding Australia, Canada, Czech Rep and Spain) to have comparable estimates from both dependent and non-dependent samples.