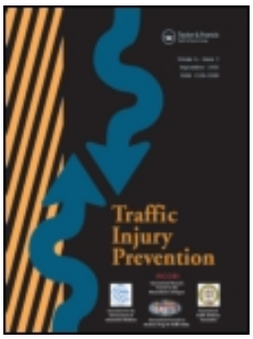

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Drinking and Driving in Vietnam: Public Knowledge, Attitudes, and Practices

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Objective: *Injuries are among the 10 leading causes of death for all ages in Vietnam, and road traffic fatalities account for approximately half of those deaths. Despite having what is considered to be one of the most stringent alcohol legislations in the region, alcohol involvement in road traffic crashes remains high. This study aims to illustrate the knowledge, attitudes, and practices around alcohol use and drinking and driving by age and sex in 3 provinces in Vietnam.*

Methods: *This study was conducted between January and February 2011, surveying randomly selected road users over the age of 17 years at gas stations in 3 provinces: Ha Nam, Ninh Binh, and Bac Giang, Vietnam. Data were collected for one week at each gas station. A knowledge, attitudes, and practices (KAPs) survey was administered in 7 time blocks of 90 min throughout the day, from 07:30 am to 9:30 pm.*

Results: *There were a total of 633 respondents almost evenly divided among the 3 provinces. Males accounted for 69.1 percent of respondents; the majority were 36 years of age or younger. Despite the belief that drinking and driving will increase the risk of a crash, a significant proportion of respondents (44.9%) reported drinking and driving; 56.7 percent admitted to drinking and driving within the last month. Drinking and driving was more common among males, with approximately 60.2 percent indicating a history of drinking and driving. This proportion was particularly high among males aged 17 to 26 (71.4%). It was found that preferred alternatives to drinking and driving when available were leaving with a nondrinker (42%), resting until "feeling conscious" (23%), and drinking less (20%).*

Conclusions: *This study shows that, in general, alcohol use and drinking and driving remain a problem in Vietnam, a major concern given that the country is rapidly motorizing and likewise increasing the likelihood of road traffic crashes in the absence of effective interventions. To target drinking and driving in Vietnam we call for a multifaceted approach, including social marketing and public education campaigns, enhanced enforcement, and programs that either limit the number of drinks to drivers or young individuals or those that provide alternatives to drinking and driving.*

Keywords Road traffic injuries; Alcohol; Road safety; Vietnam; Asia

INTRODUCTION

The global epidemic of road traffic injuries (RTIs) results in over 1.2 million fatalities and 20 to 50 million disabilities each year (World Health Organization [WHO] 2009). More than 90 percent of these occur in low- and middle-income countries (LMICs) and the vast majority of affected people are aged 15 to 44 years (WHO 2004a). Accordingly, the economic burden of RTIs is significant, representing US$518 billion globally or between 1 and 3 percent of many countries' gross national products (WHO 2009). The threat of RTIs is expected to increase; the WHO estimates that RTIs will rank as the fifth leading cause of death by 2030 (WHO 2004a).

Injuries are now among the 10 leading causes of death for all ages in Vietnam, and road traffic fatalities account for approximately half of those deaths (Ministry of Health 2009a, 2009b). The WHO estimates that RTIs are a leading cause of death and disability for those aged 15 to 29 years (WHO 2009). Over the last few years, the number of motor vehicles has rapidly increased to accommodate the demands of a growing population, as well as industrialization and urbanization. In 2009, the Vietnam Ministry of Health estimated 14,690 RTI-related deaths and a further 143,940 hospitalizations from road traffic crashes, representing a mortality rate of 18.5 per 100,000 population

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(Ministry of Health 2009a, 2009b). Annual economic losses from RTIs in Vietnam have been estimated at $US885 million, which is roughly 2.45 percent of Vietnam's gross domestic product (GDP; Asian Development Bank [ADB] 2005).

Numerous studies, including some conducted jointly by the WHO and the World Bank, implicate alcohol as a major risk factor for road traffic crashes, as well as traumatic outcomes including death or disability of individuals at a relatively young age (WHO 2004b). Substantial evidence suggests that alcohol impairs judgment and increases the possibility of engaging in other high-risk behaviors such as speeding and violating traffic rules (Cherpitel et al. 2003). It also affects vision, makes identifying risks and potentially dangerous situations in the road environment more difficult, and delays reaction time to both light and sound (Cherpitel 1993). Furthermore, in a review of 26 articles about epidemiological studies of RTIs in the context of developing countries, Odero et al. (1997) reported that nearly one fifth to one third of crashes occur at night, and the majority of the observed crashes were associated with high rates of alcohol consumption among drivers, in combination with poor visibility and greater traffic density.

Alcohol consumption in Vietnam is relatively high; a cross-country study revealed the prevalence of at-risk and moderate drinking was highest in sites in Vietnam compared to sites in Bangladesh, India, Indonesia, and Thailand (Huu Bich et al. 2009). And the country has what is considered to be one of the most stringent alcohol legislations in the region (WHO Vietnam 2011). Though Vietnam's 2001 road safety law defined the legal blood-alcohol concentration (BAC) threshold as 80 mg/dL blood, this level was reduced in 2008 to 50 mg/dL blood for motorcyclists and zero for drivers of all other vehicles (National Assembly of Vietnam 2008). Despite this, alcohol involvement in road traffic crashes continues to be a challenge. A recent study conducted in Vietnam found that over 10 percent of road traffic crashes were caused by alcohol and that alcohol was detected in the blood of over 62 percent of victims of RTIs (Lachenmeier et al. 2009). Policy implementation and prioritization will remain myopic until a more detailed picture is available at the national and local levels.

The goal of this study was to understand the knowledge, attitudes, and practices around alcohol use and drinking and driving in 3 provinces in Vietnam by age and sex. To our knowledge, this is among the first such attempts in Vietnam and will help guide the effective enforcement of existing alcohol legislation or develop more targeted social marketing and public education campaigns in the country.

METHODS

This preliminary study was conducted between January and February 2011 with the objective of capturing road users' knowledge, attitudes, and practices (KAPs) regarding road safety, alcohol use, and drinking and driving. This was done by surveying randomly selected road users over the age of 17 years at gas stations in 6 districts in the 3 study provinces—Ha Nam, Ninh Binh, and Bac Giang—all located in the north of the country.

We utilized a multistage sampling strategy with gas station as the primary sampling unit. Stage 1 entailed road selection, where all roads in a respective province were listed and categorized as national or provincial roads. Roads without gas stations were excluded because we determined that gas stations were among the safest places for interviewers to administer the survey. We then randomly selected 3 roads (2 national and one provincial) in each province from the remainder. In stage 2, we selected gas stations located on the roads listed in each province. Given that traffic volume is always higher on national roads, 2 gas stations were selected from national roads and one from provincial roads for a total of 18 sites, 6 in each province. In stage 3, road users were randomly selected for participation. One road user was selected for surveying at the beginning of each time block and every fifth road user thereafter. Informed consent and agreement to participate were obtained at the survey sites.

After giving her or his consent and agreeing to participate, each road user was asked 2 screening questions to avoid duplication. In order to capture their self-reported knowledge, attitudes, and practices regarding road safety, the effects of alcohol, and drinking and driving, study participants were asked questions about traffic laws, regulations, and their own alcohol use. A closed-ended questionnaire, developed in collaboration between the Johns Hopkins International Injury Research Unit (JHIIRU), the Hanoi School of Public Health (HSPH), and the Vietnam Country Office of the World Health Organization (WHO), was used in this survey. Items that remain in quotations reflect language appropriate to local context.

Data were collected for one week, from Monday to Sunday, at each gas station. The KAP survey was administered in 7 time blocks of 90 min each throughout the day, from 07:30 an to 9:30 pm. All data were cleaned, processed, and analyzed using Epi Data (Lauritsen 2008), SPSS (SPSS Inc. 1999), and Stata 11 (StataCorp, 2009). χ^2 statistics were calculated to assess the association between drinking and driving and committing a traffic violation, as well as the association between reported alcohol consumption and drinking and driving among drivers in Vietnam.

The study was reviewed and approved by the Institutional Review Board at the Johns Hopkins Bloomberg School of Public Health and the Hanoi School of Public Health.

RESULTS

There were a total of 633 respondents almost evenly divided among the 3 provinces (Table I). Resulting from random selection, males accounted for 69 percent of the respondents, and the majority were 36 years of age or younger (Table I). Approximately 23.2 percent of participants reported having attended college or having a higher education; 32.7 percent reported having finished their high school education, and a small proportion (4.3%) of participants reported having less than a secondary education. Only 2.4 percent of participants reported being unemployed, with 43.1 percent employed in

Table I Demographic information on study participants in Vietnam

	Male *n* (%)	Female *n* (%)	Total *n* (%)
Province			
Ha Nam	160 (74.4)	55 (25.6)	215 (34.0)
Ninh Binh	160 (76.2)	50 (23.8)	210 (33.2)
Bac Giang	117 (56.3)	91 (43.8)	208 (32.8)
Total	437 (69.0)	196 (31.0)	633 (100)
Age groups			
17–26	112 (63.6)	64 (36.4)	176 (27.8)
27–36	148 (65.8)	77 (34.2)	225 (35.5)
37–46	78 (66.1)	40 (33.9)	118 (18.6)
47–56	68 (81.9)	15 (18.1)	83 (13.1)
57+	31 (100)	0 (0.0)	31 (4.9)
Total	437 (69.0)	196 (31.0)	633 (100)
Education level			
No school	2 (50.0)	2 (50.0)	4 (.6)
Primary school or less	14 (77.7)	4 (22.2)	18 (18.0)
Secondary school	102 (76.7)	31 (23.3)	133 (21.0)
High school	148 (71.8)	58 (28.2)	206 (32.5)
Vocational education	78 (62.4)	47 (37.6)	125 (19.7)
College/university/higher	93 (63.3)	54 (36.7)	147 (23.2)
Total	437 (69.0)	196 (31.0)	633 (100)
Occupation			
Paid job	176 (64.5)	97 (35.5)	273 (43.1)
Unpaid job	139 (73.2)	51 (26.8)	190 (30.0)
Student	26 (55.3)	21 (44.7)	47 (7.4)
Housework	2 (33.3)	4 (66.7)	6 (.9)
Retired	32 (88.9)	4 (11.1)	36 (5.7)
Unemployed	12 (75.0)	4 (25.0)	16 (2.5)
Other	50 (76.9)	15 (23.1)	65 (10.3)
Total	437 (69.0)	196 (31.0)	633 (100)

paid and 30.0 percent in unpaid labor (Table I). Most of the study participants (84.0%) reported using vehicles daily. Over 93.3 percent of study participants used motorcycles or other motorized 2-wheelers, with cars, taxis, trucks, and other vehicles accounting for less than 7 percent.

A little more than 53 percent of study participants thought that road safety was the absence of "accidents." This proportion was highest in Bac Giang (90.9%) and much lower in Ha Nam (41%) and Ninh Binh (30%). When asked about the causes of traffic crashes, most of the participants (96.4%) mentioned traffic violations including speeding, drinking and driving, and lack of helmet use; about two thirds believed that more law enforcement could reduce traffic crashes.

Approximately 34 percent of study participants reported having been previously fined for a traffic violation. The proportion of traffic violations was highest in Bac Giang (almost 50%) compared to the proportions observed in Ha Nam and Ninh Binh—25.1 and 28.6 percent, respectively. As shown in Figure 1, the majority of traffic violations involved running a red light or neglecting to wear a helmet. Alcohol-related traffic violations were reported to be relatively low, just 0.9 percent (Figure 1). However, an analysis of the relationship between having been fined for a traffic violation and reported alcohol use within 2 h of driving revealed a statistically significant relationship. Individuals who reported driving or operating a vehicle within 2 h of drinking at any point in their lives were significantly more likely to have been penalized for a traffic violation ($P <$ .001; Table II). This suggests that the proportion of self-reported penalties for drinking and driving in the study provinces is likely an underestimate.

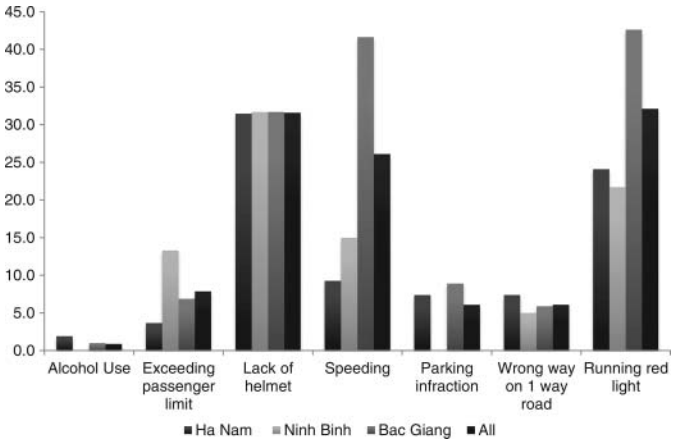

Figure 1 Distribution of traffic violations among drivers by type and province in Vietnam.

In all provinces, a majority of study participants conceded that alcohol could lead to road traffic crashes (68.3%), and the proportion was highest in Bac Giang (82.8%) compared to the other 2 provinces (Ha Nam: 61.9%; Ninh Binh: 60.5%; Figure 2). However, when asked whether they knew about drinking and driving legislation that penalizes drivers found to be under the influence of alcohol, only 30.3 percent were sure. Of those who reported knowing about the laws, 83.9 percent reported knowing that police check to see whether a driver's BAC is over the legal limit. About 50 percent of the study participants reported knowing the BAC limits, but when asked about the exact limits, only 12.6 percent were able to identify them correctly.

Of the 633 study participants, 67 percent reported that they consume alcohol; 33 percent did not admit to consuming alcohol. Study participants from the 27- to 36-year age group accounted for the largest proportion of self-reported drinkers (34%). Alcohol use was lower among study participants aged 17 to 26 (27%) and lowest among study participants aged 37 to 46 (20%).

Of the 67.2 percent of study participants who used alcohol, 87.3 percent of self-reported drinkers were male and 12.7 percent were female. The highest proportion of daily alcohol users were males aged 37 to 46 (27%) closely followed by males

Table II Relationship between reported traffic violations and alcohol consumption among drivers in Vietnam

	Have driven within 2 h of using alcohol		
Have been fined for a traffic violation	Yes *n* (%)	No *n* (%)	Total *n* (%)
Yes	141 (66)	74 (34)	215 (100)
No	138 (38)	224 (62)	362 (100)
Total	279 (48)	298 (52)	577 (100)

$\chi^2 = 40.73$. $P < 0001$.

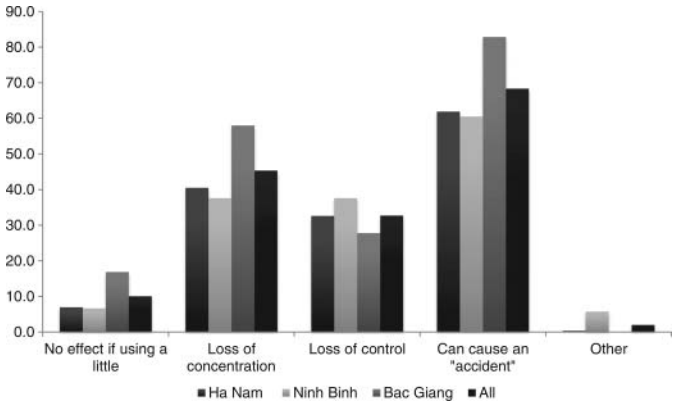

Figure 2 Knowledge on driving under the influence of alcohol among drivers in Vietnam.

aged 27 to 36 and 47 to 56 (each at approximately 24%). The majority of males reported drinking at home (47.3%), and this was true across all age groups except for males aged 17 to 26, who reported drinking in a restaurant or bar most frequently (34.7%). Females reported using alcohol in a restaurant more frequently than their homes, friends' homes, or other (57.4%), and this was true across all age groups except for women aged 47 to 56, who preferred their own homes (100%).

Despite the belief that drinking and driving will increase the risk of a crash, a significant proportion of respondents (44.9%) reported drinking and driving in the past (Figure 3). Differences between sexes emerged regarding drinking and driving practices. Just 10.7 percent of females reported driving within 2 h of using alcohol compared to 60.2 percent of males; 56.7 percent of study participants admitted to drinking and driving within the month prior to being surveyed. Among those who admitted to drinking and driving within a month of the survey, 25.5 percent reported drinking and driving within 2 h of being surveyed; 0 percent of study participants who reported engaging in this practice were female.

Approximately 29 percent of study participants reported never drinking and driving. However, many study participants tended to have the perception that limiting alcohol use to a few drinks and driving slowly afterwards is an acceptable behavior (73%), and some reported they would not have a problem drinking and driving if driving a short distance (25%). The highest proportion of self-reported drinking and driving was observed in Bac Giang (56%) followed by Ninh Binh (51.9%; Figure 3). Further analysis showed that those who reported having driven within 2 h of using alcohol at any time in their lives were more likely to have "limited their alcohol intake" beforehand as opposed to avoiding alcohol ($P < .001$; Table III). Additionally, 78 percent of study participants reported riding as a passenger in a vehicle driven by someone who had been drinking. As expected, drinking and driving was more common among males, with approximately 60.2 percent of males indicating a history of drinking and driving. This proportion was particularly high among males aged 17 to 26 (71.4%). Drinking and driving was not nearly as common among females: of those

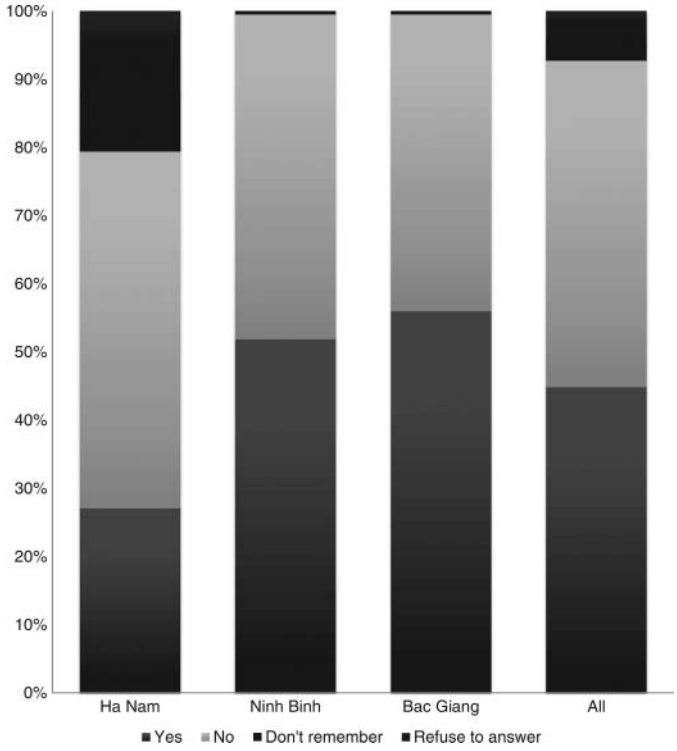

Figure 3 Self-reported drinking and driving by province.

who had admitted to the practice (22%), drinking and driving was highest among women aged 27 to 36 (52.5%).

The study also found that nearly 8 percent of study participants reported being involved in a crash after drinking alcohol. Furthermore, 13 percent of respondents reported being passengers in a drinking and driving-related crash. In Ha Nam and Ninh Binh, males were responsible for 100 percent of the self-reported alcohol-related crashes, whereas in Bac Giang, males were responsible for approximately 92.3 percent. Among them, 34 percent reported that the accident occurred in the last year, and 65 percent of this same group received no penalty.

In terms of general enforcement of the alcohol law, 41 percent of study participants reported ever being stopped by the police, of whom only 5 percent reported being checked for drinking and driving; of these, 21 percent were found to be under the influence. Among those found to be under the influence of alcohol, all reported receiving penalties for registering a BAC above the legal limit.

Table III Relationship between reported alcohol consumption and drinking and driving among drivers in Vietnam

Have driven within 2 h of using alcohol	Avoid alcohol *n* (%)	Limit alcohol use *n* (%)	Total *n* (%)
Yes	67 (24)	216 (76)	283 (100)
No	197 (66)	103 (34)	300 (100)
Total	264 (45)	319 (55)	583 (100)

$\chi^2 = 103.6358$. $P < .001$.

The study also sought to understand options available to individuals when under the influence, as well as reasons people chose to drive while intoxicated. It was found that preferred alternatives to drinking and driving, if available, were leaving with a nondrinker (42%), resting until "feeling conscious" (23%), and drinking less (20%). However, drinking and driving continues to be a problem, and the most common reasons cited for this practice were "feeling conscious" (90%); no alternative (10%); and being near home or work (9%).

Study participants were also asked to respond to a series of statements regarding potential deterrents to drinking and driving, 72.2 percent of study participants believed that enhancing anti-drinking and driving social marketing and education campaigns would effectively reduce the frequency of alcohol related crashes. Encouragingly, 88.9 percent agreed that increased enforcement of drinking and driving regulations would decrease the number of crashes. And 53 percent of study participants reported that they would not drink and drive to avoid being caught by the police.

DISCUSSION

This study shows that, in general, alcohol use, and the frequency thereof, remains reportedly high among drivers in Vietnam. Therefore, though it is clear that new strategies are necessary to address the country's drinking and driving problem, there is first a need to understand the prevailing KAPs around drinking and driving in Vietnam. To our knowledge, this is among the first studies in Vietnam that attempts to accomplish such a goal.

Our results indicate that though many people have the appropriate perceptions of alcohol consumption and its influence on driving, namely, that driving while under the influence of alcohol can cause a crash, this knowledge does not necessarily translate into safe practices. Again, only 29 percent of study participants reported that they do not drink and drive. Many study participants (65%) admitted to limiting their alcohol intake when they use alcohol prior to driving. However, they did not specify the amount they limit themselves to, which may be subjective, because we found that only 12.6 percent of the study participants were able to correctly identify the legal BAC limit. In addition, our results show that individuals who reported having driven within 2 h of drinking were more likely to have "limited" their alcohol consumption as opposed to avoiding alcohol altogether before driving (76% and 24%, respectively). Nonetheless, that approximately 24 percent of study participants reported contradictory information regarding alcohol use and their own drinking and driving practices is a major concern. Therefore, though this finding may call for additional social marketing and education campaigns that emphasize the deadly consequences of drinking and driving, these sort of campaigns alone are not enough (Noar 2006). Additionally, males, especially in the younger age groups (17–36 years), were responsible for the majority of drinking and driving episodes, as well as related crashes in all 3 provinces. This demographic is usually associated with risky behaviors (Giang et al. 2008; Pham et al. 2010), which would be unlikely to be affected by large-scale communication campaigns alone.

The problem of drinking and driving in Vietnam thus calls for an enforcement-based, multifaceted approach. Based on the results of this study, this approach may include a combination of social marketing and public education campaigns, enhanced enforcement of existing legislation, and programs that limit drivers' or young individuals' access to alcohol (Tay 2005) and provide alternatives to drinking and driving (Pinsky et al. 2005). Social marketing and public education campaigns may be used to highlight the magnitude of the problem, the impairing effects of different levels of alcohol consumption, and the alternatives to driving available to individuals who have been drinking. These campaigns ought to be targeted and include clear messages tailored for different media and audiences, with much of the effort geared toward younger individuals. The majority of study participants indicated that avoiding being caught by the police would be their main deterrent for drinking and driving. Additionally, enhanced enforcement has been shown to be an effective option for road safety in a variety of settings (Bishai and Hyder 2006) and, when used in conjunction with social marketing and public education campaigns, could reinforce behavior change in the population (Wakefield et al. 2010).

Our results indicate that, when available, people preferred to use alternative means of transportation rather than driving under the influence. For example, one of the main reasons why individuals said they drink and drive was that they had no other alternative. As such, in an environment and culture where consumption of alcohol is quite ubiquitous, programs that provide alternatives to drinking and driving may be warranted. These might include options such as friends telling friends not to drive, inexpensive taxi services, and designated driver programs (Barr and MacKinnon 1998; Ditter et el. 2005; National Highway Traffic Safety Administration [NHTSA] 2004, 2007; Rivara et al. 2007; Rothschild et al. 2006; Sarkar et al. 2005).

This preliminary study is based on self-reported data and is therefore subject to all of the limitations of such a method, including recall and reporting biases. Although study participants were selected at random, we acknowledge that females are underrepresented, which has the potential to silence women's voices regarding KAPs associated with drinking and driving; this is a major limitation. We implore researchers to situate sex and gender more centrally in further studies utilizing the theoretical frameworks introduced in the WHO report *Alcohol, Gender and Drinking Problems* to approach differences in drinking and likewise drinking and driving behavior (Obot and Room 2005). Another limitation of this study is the inability to confirm self-reported alcohol use while driving. Given that drinking and driving is a sensitive subject, and that the majority of respondents reported knowing the harmful effects of driving under the influence, it is believed that the prevalence of the practice seen in this study is an underestimate and that the true prevalence

may be higher, especially among females. This, however, only underscores the importance and urgency of addressing the issue of drinking and driving in Vietnam.

To develop appropriate and effective programs there is a need not only for a greater understanding of the prevailing KAPs around drinking and driving but for a more complete and accurate picture of alcohol involvement in RTIs in Vietnam. Then it will become possible to quantify the health and economic burdens that alcohol places on individuals and society. Therefore, as highlighted throughout the injury literature, we call for continuous, systematic, and sustainable data collection efforts on RTIs and related risk factors in Vietnam (Chandran et al. 2010; Hofman et al. 2005; Hsia et al. 2010; Lett and Kobusingye 2002; Mock et al. 2004). We are confident that more information will allow for better legislation that closes gaps on repeat offenders; targeted social marketing and public education campaigns that persuade drivers not to drink and drive; and outline consequences when they choose to do so anyway.

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DISCLAIMER

Authors include staff members of the World Health Organization. The authors alone are responsible for the views expressed in this publication and they do not necessarily represent the decisions, policy, or views of the World Health Organization or Bloomberg Philanthropies.

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