Application of 0.05 Per Cent Legal Blood Alcohol Limits to Traffic Injury Control in Bangkok

PAIBUL SURIYAWONGPAISAL, M.D., M.Sc.*,
ADISAK PLITAPOLKARNPIM, M.D.**,
ARAYA TAWONWANCHAI, M.A.***

Abstract

A substantial proportion (44%) of traffic injury cases seeking emergency services in public hospitals had a blood alcohol concentration (BAC) of 0.1 per cent or more. To reduce alcohol related traffic injuries and deaths, a law was enacted setting a criminal *per se* legal blood alcohol limit at 0.05 per cent in 1994.

However, not until 1997, was an active public education program undertaken on a national scale to raise awareness against drink driving and to support law enforcement. This includes dissemination of knowledge through multiple channels e.g., roadside posters; stickers on the back of vehicles; sporadic radio and TV programs or spots; public announcements; press reports. In 1999, highly visible sobriety check points were set up as a measure for law enforcement.

In order to systematically assess the campaign, multiple methods were used to collect relevant data. This report focused on the outcomes of the campaign based on hospital surveillance data in the emergency rooms of 4 public hospitals from March to November, 2000 on alternate months.

It was found that the campaign succeeded in raising public awareness and support for law enforcement against drink driving. However, the proportion of road victims with illegal BAC seeking emergency care did not decline after 17 months of the campaign. Limitations and weaknesses of law enforcement activities were discussed along with recommendation for future action.

Key word : Drink Driving, Evaluation, Thailand

**SURIYAWONGPAISAL P,
PLITAPOLKARNPIM A, TAWONWANCHAI A
J Med Assoc Thai 2002; 85: 496-501**

* Community Medicine Center,
** Department of Pediatrics, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok 10400,
*** National Health Foundation, Bangkok 10900, Thailand.

Traffic accidents are the leading cause of death for persons between the ages of 15 and 59 in Thailand[1]. Traffic injuries and deaths cost the nation over 213 million USD in lost economic productivity, hospital and property costs[2]. 44 per cent of traffic injury cases seeking emergency services in public hospitals had a blood alcohol concentration (BAC) of 0.1 per cent or more[3]. To reduce alcohol related traffic injuries and deaths, a law was enacted setting criminal per se legal blood alcohol limit at 0.05 per cent in 1994[4]. Penalties included a fine of up to 250 USD or a 3-month jail term or both. Apart from the legal BAC law, there are few laws restricting alcohol availability i.e., prohibition of sales 24 hours before the end of election day and closure of bars and nightclubs before 2 a.m.

However, not until 1997, was an active public education program undertaken at national scale to raise awareness against drink driving and to support law enforcement. This includes dissemination of knowledge through multiple channels e.g., roadside posters; stickers on the back of vehicles; sporadic radio and TV programs or spots; public announcements; press reports. In 1998, highly visible sobriety check points consisting of 17 police officers were set up as a measure for law enforcement on a rotating spot on the road network in Bangkok at night time from 1-4 a.m. (initially from 10 p.m. to 1 a.m.) 3 times a week. The road network covered a total area of 1,565 square kilometers of Bangkok Metropolis with 3.8 million registered motor vehicles[5]. The public education program and the law enforcement activity (considered together as drink driving campaign in this report) were a joint initiative of tripartite partners i.e., public sector, business sector and the third sector. The Ministry of Public Health (MOPH) and the Police Department represented the public sector and were responsible for implementing the activities with some support both in cash and in kind from the business sector. The Club Against Drunk Driving, an NGO headed by a medical doctor, played a pivotal role in coordinating and monitoring. While another NGO, the National Health Foundation, was responsible for outcome evaluation sponsored by the Thailand Research Fund, a quasi-governmental-research funding agency.

In order to systematically assess the campaign, multiple methods were used to collect relevant data i.e., hospital surveillance of alcohol-related injuries and deaths from traffic accidents at emergency rooms (ER) in public hospitals; surveys of attitudes, perceptions and practices pertinent to the campaign among road users. This report focused on the outcomes of the campaign based on the hospital surveillance data.

METHOD

Out of 21 public hospitals in Bangkok, 4 hospitals volunteered to take part in the study. They were among the top 5 public hospitals with the highest records of trauma cases. The total number of traffic injury cases among the 4 hospitals accounted for 44 per cent and 47 per cent of all reported cases by public hospitals in Bangkok in 1998 (45,341 injured) and 1999 (43,310 injured), respectively. Given the facts that sobriety check points have been set up at night time only and a prior report[6] of high prevalence of drink driving at night time, this study chose to monitor injury cases accordingly. All traffic injury cases seeking care at the ER's during 6 p.m. to 6 a.m. were interviewed by a nurse using a standard questionnaire and tested for BAC using a breathalyzer (Lion Alcometer SL400) after giving informed consent. A proxy interviewer was used if patients could not participate due to severe medical conditions e.g., coma, drunkenness, hypovolemic shock. A blood sample was obtained for BAC if a breathalyzer could not be used in cases with impaired consciousness or in dead cases. The interview included demographic profile, road user status (driver, pedestrian, passenger), mode of travel, time of crashes and time of arrival at ER. The medical record of each case was reviewed by a nurse to provide information about the nature of injuries and discharge status from the ER. Data collection at ER's were undertaken during the second week of each month (Monday till Sunday) on alternate months starting from March 2000 till November 2000.

Data were entered and processed using the program Epi Info, version 6.0[7]. Descriptive statistics, ANOVA test and Chi-square test were undertaken where appropriate. A statistically significant level was considered at $p<0.05$.

RESULTS

During the specified period, 696 traffic injury cases (92%) out of a total of 752 cases participated in the study. Table 1 depicts the characteristics of the traffic injury cases. The majority (80.3%) of subjects were male and were 15-44 years

Table 1. Characteristics of traffic injury cases.

Characteristic (N)	%
Male (694)	80.3
Age group (685)	
<15	7.2
15-24	29.9
25-44	52.2
45-64	8.9
>64	0.3
Types of road users (696)	
Pedestrians	12.9
Drivers	63.3
Passengers	23.7
Mode of travel (694)	
Motorcycle	64.2
Pedestrian	12.1
Motorcycle taxi	5.6
Car	4.2
Bicycle	3.7
Pickup	3.4
Three wheel taxi	2.0
Taxicab	1.6
Van	0.9
Bus	0.9
Others	1.2
Time of crashes (670)	
6-8 p.m.	25.7
9-11 p.m.	28.3
0-2 a.m.	18.4
3-5 a.m.	12.4
Before 6 p.m.	11.5
Outcome upon discharge from ER (667)	
Home	72.3
Dead	0.3
Observation room	8.2
Inpatient	13.5
Operation theatre	3.3
ICU	0.9
Referred	1.0
Don't know	0.4
BAC in % (581)	
0	50.9
0.001-0.049	5.2
0.05-0.099	6.2
0.1-0.149	10.8
0.150-0.199	6.3
>0.199	4.2

of age. 63 per cent were drivers. 64 per cent traveled on motorcycles, one of the most common modes of transportation in the city. Nearly 90 per cent had crashes at nighttime. About half of the victims had alcohol in their blood. The majority of those with blood alcohol had an alcohol level in excess of the legal limit. Table 2 shows a significant rising trend of BAC from 6 p.m. to 5 a.m. in the victims.

With regard to injury severity, most of the subjects (72%) suffered from a minor injury not requiring hospitalization (Table 1). Yet, over one fourth could be considered severely injured and 0.3 per cent lost their lives.

Table 3 demonstrates the percentage of the victims who were drivers with illegal BAC. The figure kept rising from the beginning to the end of the year 2000. Yet the difference was not statistically significant.

DISCUSSION

Reduction of injury and death related to drink driving should be considered as the final goal of the drink driving campaign. To this end, the health care system has a crucial role to play not only in terms of providing an efficient emergency care but also close monitoring and evaluation of the final goal. Regrettably, both roles have not been systematically established in the Thai health care system. As a matter of fact, an attempt has been made by the MOPH to run an injury surveillance system on a large scale but has so far failed to provide timely information for policy decision (a 5-year lag time from data collection to report). Instead of collecting data on a daily basis throughout the year as practiced in the existing MOPH system, periodic data collection has been carried out as described above. This system demands fewer man-hours, which has already been limited and overwhelmed by workload. Hence, it seems more likely to be replicated elsewhere.

Findings from this study clearly indicated that alcohol-related traffic injuries had the lion's share of traffic injury (49.1%) among ER cases in Bangkok. Yet, this claim could be biased toward a public hospital setting since private hospitals were not included. The reasons for the low participation rate of traffic injury cases seemed to lead to an under estimate of alcohol-related traffic injury. Actively working-age men were the most affected group of the population (82% of the cases whereas this age group constituted only 36.8 per cent of the general population). They were relatively under privileged. Given the fact that 43 per cent of 3.7 million registered motor vehicles in Bangkok were motorcycles[5], motorcycling disproportionately constituted the biggest mode of travel used by the victims. Nighttime traveling on Bangkok roads could be regarded as an increased risk of traffic injury since the proportion of nighttime victims in this study was

Table 2. Mean BAC by the time of arrival at ER.

Time of arrival at ER	N (mg/dl)	Mean	95 per cent confidence interval for Mean		Range (mg/dl)
			Lower Bound	Upper Bound	
1800-2000	127	8.46	1.40	15.51	0 - 317
2100-2300	153	38.33	27.51	49.15	0 - 328
0000-0200	101	74.22	58.08	90.35	0- 471
0300-0500	77	80.75	61.69	99.82	0 - 350
Total	458	45.09	38.35	51.84	0 - 471

p = 0.000

Table 3. Percentage of drivers with BAC ≥0.05 per cent during the period of study.

Month	%	N
March	30.0	70
May	35.9	78
July	30.4	69
October	43.1	72
November	44.6	83
Total	37.1	372

p = 0.202

out of proportion to the number of nighttime road users. The rising trend of BAC level from evening to dawn (Table 2) strongly suggested that the risk for alcohol-related traffic injury followed a similar trend.

After 8 months of law enforcement and over 2 years of a public information campaign against drink driving, evidence from this study (Table 3) failed to support the effectiveness of the campaign in terms of reducing alcohol-related injuries. On the other hand, it might suggest a rising trend of alcohol-related injuries.

From the deterrence theory point of view, law enforcement in combination with publicity has to reach a certain scope and intensity in order to raise driver awareness to an extent that they do not want to take the risk of being detected and penalized for drink driving[8]. In Australia and Canada, for instance, 82 per cent to 63 per cent of motorists reported having been stopped and tested for alcohol at some point and 47 per cent to 28 per cent reported having been stopped and tested three or more times [9]. During the 1980's Australia enjoyed a decline of drinking and driving by 32 per cent while the figure for Canada was 28 per cent[9].

In comparison to successful campaigns against drink driving in the West[10], the law enforcement activity in Bangkok was much more limited in scope and intensity. The sobriety checkpoints covered a tiny fraction of the road network with a very low frequency of operation (3 times weekly) hence reaching a small number of drivers. 5 months after commencement of the checkpoints, a survey of 1027 drivers, mostly (38%) motorcyclists, in 10 randomly selected gas stations revealed that only 10.4 per cent of respondents reported being stopped by the police for BAC testing during the past 2 months[11]. 1000 drivers interviewed on the telephone survey in the same month reported a similar figure (9.2%)[12]. 82 per cent and 94 per cent of subjects in the former and the latter studies, respectively, perceived a very low chance of being stopped by the police for BAC testing even though over 90 per cent accepted the benefit of law enforcement.

What is the explanation for such a limited law enforcement activity? Circumstantial evidence suggested that low policy commitment in terms of clear instructions and effective resource allocation to the police force played a key role. The first piece of evidence came from the investigators' attempt to persuade the police force to set up an independent test of BAC on drivers. This aimed at systematic feedback to the campaign in terms of changes of drink driving behavior. Regrettably, the attempt was denied by police officers of all stations in Bangkok citing the reason that there had not been any instructions and instrumental support to do so. This finding coincided with another piece of evidence from a

documentary review by the investigators. The review on the annual plan of the Police Department for the fiscal year 2000 revealed a law enforcement project against drink driving without a target or measurable objective and without a clearly specified amount of budget[13].

Personal interviews with a few police officers revealed that cumbersome prosecution procedures could also hamper apprehension and charging drinking drivers. In the Thai system, a detected drinking driver has to be transferred from the checkpoint on the road site to a police station in order to be prosecuted. Decision on penalty has to be finalized in court. These steps clearly create an additional burden on an over-burdened police force.

This report concludes that if legislative measures, a policy instrument, would be effective in road safety improvement in developing countries, there seems to be a need for strong policy commitment. This has to be translated into a workable plan of action, effective resource allocation and management. The successful movement of "Mother Against Drunk Driving" in the US exemplifies the key role of civil society in policy adoption and implementation, which has not yet reached a meaningful momentum in Thailand. The next step of policy advocacy in Thailand should shift the focus from personal responsibility to state responsibility to effectively enforcing the law. This entails revelation of those weaknesses in the law enforcement mechanism and possible remedial actions to overcome it. For instance, the prosecution procedure should be revised to minimize the unnecessary burden to the police force; an action plan should be clearly laid out with measurable objectives and concrete instrumental support. A systematic independent evaluation should be put in place to provide timely feedback to policy implementation, the role the health sector could play and influence other sectors in public health advancement.

ACKNOWLEDGEMENTS

The investigators wish to thank the National Health Foundation; Faculty of Medicine, Ramathibodi Hospital; and the Institute of Medical Services, Accident and Public Disaster for instrumental support. This study was funded by Thailand Research Fund (Grant no. RDG 32-062-2543).

(Received for publication on January 7, 2002)

REFERENCES

1. Bureau of Health Policy and Plan. Health in Thailand. 1995-1996. Bureau of Health Policy and Plan. Ministry of Public Health. War Veteran Press. Bangkok. 1997.
2. Thailand Development Research Institute. TDRI White Paper: Economic loss from road accident. Volume no. 9; July 1994. ISSN 0859-0036.
3. Lapham SC, Brown P, Suriyawongpaisal P, et al. Use of AUDIT for alcohol screening among emergency room patients in Thailand. Substance Use & Misuse 1999; 34: 1881-95.
4. Royal Gazette. Volume 111 Section 54 a December 8, 1994.
5. Department of Land Transport, Ministry of Communication and Transportation. 1997.
6. Chongsuvivatwong V, Ritsmitchai S, Suriyawongpaisal P, et al. High prevalence of alcohol driving in Thailand. Drug and Alcohol Review. 1999; 18: 293-8.
7. Dean, AG, Dean JA, Coulombier D, et al. Epi Info, version 6. A word processing, database, and statistics program for epidemioology or microcomputers, (Atlanta, GA, Center for Disease Control and Prevention). 1994.
8. Zaal D. Traffic Law Enforcement. A review of the literature. Monash University Accident Research Center. Report No. 53, 1997.
9. International Council on Alcohol, Drugs and Traffic Safety. Reporter. The Newsletter of International Council on Alcohol, Drugs and Traffic Safety. Vol. 11, No. 3. Summer 2000. ISSN 1016-0477.
10. Hingson R, Heeren T, Winter M. Effects of recent 0.08 per cent legal blood alcohol limits on fatal crash involvement. Injury Prevention 2000; 6: 109-14.
11. Suriyawongpaisal P, Prittapolkarnpim A, Thawornwanchai A. A telephone survey on drivers' opinion and perception related to drink driving campaign

in Bangkok. (Unpublished report).
12. Suriyawongpaisal P, Prittapolkarnpim A, Thaworn-wanchai A. A gas station survey on drivers' opinion and perception related to drink driving campaign in Bangkok. (Unpublished report).
13. Bureau of Planning and Budget. Traffic Management Plan. Fiscal Year 2543. National Police Office.

การประเมินผลการแก้ปัญหาการบาดเจ็บจากอุบัติเหตุจราจรที่มีสุราเกี่ยวข้องในกรุงเทพมหานคร

ไพบูลย์ สุริยะวงศ์ไพศาล, พ.บ., วท.ม.,*
*อดิศักดิ์ ผลิตผลการพิมพ์, พ.บ.**, อารยา ถาวรวันชัย, นศ.ม.****

อุบัติเหตุจราจรเป็นสาเหตุการตายอันดับต้นของคนอายุ 15–59 ปี ก่อให้เกิดภาระต่อระบบเศรษฐกิจเป็นมูลค่าถึง 213 ล้านเหรียญสหรัฐในแง่การสูญเสียผลิตภาพ ทรัพย์สินและค่าใช้จ่ายทางสุขภาพ ร้อยละ 44 ของผู้บาดเจ็บที่เข้ารับบริการห้องฉุกเฉินของโรงพยาบาลรัฐมีระดับแอลกอฮอลตั้งแต่ 0.1% ขึ้นไป เพื่อลดความสูญเสียอันเนื่องจากอุบัติเหตุจราจรที่มีสุราเกี่ยวข้อง จึงมีกฎหมายบัญญัติว่าระดับแอลกอฮอลในผู้ขับขี่ตั้งแต่ 0.05% เป็นระดับที่ผิดกฎหมายต้องโทษปรับสูงสุดถึง 10,000 บาท หรือจำคุก 3 เดือนหรือทั้งจำทั้งปรับ

แม้จะมีกฎหมาย แต่การบังคับใช้กฎหมายและการรณรงค์ทางสื่อเพื่อลดปัญหาอุบัติเหตุจราจรที่เกี่ยวข้องกับสุราไม่ปรากฏเป็นรูปธรรมจนกระทั่งปี พ.ศ. 2540 จึงได้มีการรณรงค์เมาไม่ขับเกิดขึ้นโดยมุ่งให้ความรู้แก่ประชาชนผ่านสื่อต่าง ๆ และในปี พ.ศ. 2542 จึงได้มีการใช้มาตรการทางกฎหมายด้วยการตั้งด่านตรวจจับเป็นครั้งแรกในกรุงเทพ ฯ ตั้งแต่เวลา 01.00–04.00 น. สัปดาห์ละ 3 ครั้ง

อาจกล่าวได้ว่า การรณรงค์เมาไม่ขับและตามด้วยการใช้มาตรการทางกฎหมายเป็นการดำเนินการป้องกันอุบัติเหตุจราจรในขอบเขตกว้างขวางและศึกษาที่สุดเท่าที่เคยมีมา คำถามคือ ผลที่เกิดขึ้นเป็นอย่างไร อะไรคือเงื่อนไขแห่งความสำเร็จหรืออุปสรรคสำคัญ การวิจัยนี้มุ่งหาคำตอบให้กับคำถามดังกล่าวโดยใช้วิธีเก็บข้อมูลจากหลายช่องทางได้แก่ การสำรวจพฤติกรรม ความรู้ เจตคติที่เกี่ยวข้องของประชาชนและผู้ขับขี่ผ่านทางโทรศัพท์และทางปั๊มน้ำมัน การติดตามระดับแอลกอฮอลในผู้บาดเจ็บ/เสียชีวิตที่ห้องฉุกเฉินของโรงพยาบาลใหญ่ 4 แห่งในกรุงเทพ ฯ เดือนเว้นเดือนตั้งแต่ มีนาคม ถึง พฤศจิกายน พ.ศ. 2543

การวิจัยพบว่า การรณรงค์เมาไม่ขับทำให้เกิดความตระหนักต่อปัญหาอุบัติเหตุที่เกี่ยวข้องกับสุรา และเกิดการยอมรับมาตรการบังคับใช้กฎหมายสูงถึงร้อยละ 95 ของกลุ่มตัวอย่าง อย่างไรก็ตามสัดส่วนของผู้บาดเจ็บที่มีแอลกอฮอลในเลือดสูงผิดกฎหมายไม่ได้ลดลง ผู้วิจัยได้ชี้ข้อจำกัดและอุปสรรคของการบังคับใช้กฎหมายตลอดจนข้อเสนอแนะไว้ในรายงาน

คำสำคัญ : บาดเจ็บ, แอลกอฮอล, กฎหมาย, ประเมินผล

ไพบูลย์ สุริยะวงศ์ไพศาล,
อดิศักดิ์ ผลิตผลการพิมพ์, อารยา ถาวรวันชัย
จดหมายเหตุทางแพทย์ ฯ 2545; 85: 496–501

* ศูนย์เวชศาสตร์ชุมชน,
** ภาควิชากุมารเวชศาสตร์, คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล, กรุงเทพ ฯ 10400
*** มูลนิธิสาธารณสุขแห่งชาติ, กรุงเทพ ฯ 10900