Commentary

State Liquor Laws as Enablers for Impaired Driving and Other Impaired Behaviors

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Abstract: In theory, liquor control laws are meant to promote temperance. In most states, however, a purveyor of alcoholic beverages does not have to stop serving a customer until she/he appears "intoxicated"; this means that many people continue to be served alcohol long after they have reached the legal limit for impaired driving, .10 per cent blood alcohol concentration (BAC). Objective impairment and increased injury risk substantially precede clinical signs of intoxication. State liquor control laws should be changed to establish a maximum permissible number of drinks that may be served so that patrons are unlikely to exceed a maximum BAC (.10 per cent or .15 per cent) and to adopt a BAC of .10 per cent or .15 per cent as presumptive evidence that a patron has been served too much. Currently five states have a cutoff based at least in part on BAC, while the remaining states either have cutoffs based on appearance of intoxication or no cutoff at all. (*Am J Public Health* 1986; 76:787–792.)

Introduction

It has been recognized for many centuries that alcohol is associated with injuries[1] and, since 1904, that it is a cause of motor vehicle crashes.[2] The quantitative nature of this relationship, however, has become apparent only gradually. The reason for this delay in discovery is that impairment by alcohol—objective evidence of reduced ability to function—occurs at substantially lower blood alcohol concentrations (BACs) than does the appearance of intoxication, i.e., clinical signs that a person has had too much to drink. We now know that alcohol contributes to about one-third to one-half of all injury fatalities, whether unintentional or deliberate.

Chemical and other physical tests to determine quantitative evidence of alcohol in blood, urine and breath were developed during the early 1900s.[3] As these tests were applied in laboratory experiments and to populations of persons with and without highway and nonhighway injury, several facts became apparent:

- By the time a BAC of .10 per cent by weight is reached virtually all persons, including usual heavy drinkers, are significantly impaired in performance of tasks important to driving, with relatively limited impairment among most people at BACs below .05 per cent.
- Crash risk usually begins to rise at BACs above .05 per cent; at a BAC of .10 per cent there is at least a sixfold increase in crash risk[5,6] and a lesser but still significant risk of being struck as a pedestrian when compared to the risk of persons without alcohol.[7] The lower rate of increase in crash risk for pedestrians may reflect some protection of pedestrians who are avoided by alert motorists.
- At a BAC of .15 per cent the crash risk is over 25 times that of the driver with no alcohol.[5,6] The relative risk of falling while walking increases at higher BACs at about the same rate as does the risk of crashing,[8] suggesting that the extent to which alcohol impairs ability to carry out nontraffic-related activities is similar to that for traffic. About three-fourths of injury fatalities involving alcohol have BACs of .10 per cent or higher.[6,8–10] Such fatalities include persons injured in highway crashes, in the home, in recreational and other activities, and in homicides (Table 1).
- Nonetheless, among drivers who are stopped by police officers, over 80 per cent of those with BACs of .10 per cent are able to pass a usual clinical test for intoxication; it is not until BACs of .25 per cent or higher are reached that police can identify 95 per cent or more as clinically intoxicated.[11] This inability to identify when a person has had enough to reach a BAC that is impairing or even illegal for driving has been documented for experienced bartenders as well; they were even less able to identify persons with a BAC of ≥ .10 per cent than police officers.[12] Of those persons with BACs of .10 per cent driving past a police officer, the officer will observe behavior suspicious enough to produce an arrest for impaired driving on only one occasion in 200.[13] Even at BACs of .30 per cent or higher, the arrest rate is only 5 per cent. Inability to identify a person who has consumed enough alcohol to be severely impaired occurs among physicians as well[14] and is no reflection on the competence of the observers.

As a person's frequency and quantity of alcohol consumption increases, tolerance to appearance of intoxication usually occurs to a greater extent than does tolerance to impairment. This illusion of safety is most commonly seen in heavy drinkers who, although objectively impaired, are thought to be able to "hold their liquor." This fact promotes unabated serving of alcohol to heavy drinkers in those cases where individuals or systems depend on the appearance of intoxication before initiating efforts to prevent further drinking, driving, or other hazardous activities. In Vermont, for example, the Department of Liquor Control has ruled that it was not illegal for a bartender to serve a person who had a BAC over .30 per cent because there was insufficient evidence that the individual appeared intoxicated.*

Early highway safety laws, passed when chemical tests were still in their infancy and rarely used, were also based on identifying and apprehending drivers who appeared intoxicated. As test procedures improved, however, and laboratory and epidemiologic research documented the serious risk

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TABLE 1—Distribution of Blood Alcohol Concentrations in Unintentional and Deliberate Injury Fatalities

Type of Fatality	Per Cent Blood Alcohol Concentrations				
	.00	.01–.04	.05–.09	.10–.14	≥.15
Drivers[6]	46.2	3.8	8.5	13.2	28.3
% among alcohol fatalities	—	7.0	15.8	24.6	52.6
Drivers[9]	41.9	4.0	6.0	11.7	36.3
% among alcohol fatalities	—	7.0	10.3	20.2	62.6
Pedestrians[8]	49	2	4	11	35
% among alcohol fatalities	—	4	8	21	67
Pedestrians age 15–59*[9]	44.0	0.6	4.0	7.3	44.0
% among alcohol fatalities	—	1.2	7.1	13.1	78.6
Home injury age 15–59*[10]	55	3	10	3	28
% among alcohol fatalities	—	8	23	8	61
Homicide[10]	56	7	9	8	20
% among alcohol fatalities	—	15	21	18	46
Suicide[10]	68	7	9	3	13
% among alcohol fatalities	—	21	29	10	40

*Persons age 60 or older were excluded because generally fewer than 10 per cent of their fatalities involve alcohol, the injury event commonly having been caused by medical impairment or problems related to aging.

of injury at BACs not commonly identifiable by intoxication, the laws changed. Beginning in 1939, a BAC of .15 per cent or higher was considered to be illegal for driving.[15] In 1960, the recommended cutoff was lowered to .10 per cent, and at present the highway safety laws of all states set a BAC standard of .10 per cent or less (.08 per cent in two states) as the legal limit above which a person is considered to be unacceptably under the influence of alcohol, whether or not he looks intoxicated.

In contrast to highway safety laws, however, most liquor control laws have not changed at all since the concept of not serving "intoxicated" persons was first promulgated at the close of Prohibition. Few state laws or regulations currently use BAC, impairment, or number of drinks as their measure of what is too much alcohol for the good of the individual or of the public who may be exposed to that individual. The number of drinks can be related to BAC and impairment if information is available about weight and drinking rate over time. With respect to safety, therefore, the liquor control laws represent an approach to avoiding trouble that is still dependent on prescientific information. They actually serve to enable impairment, rather than to prevent it.

The Concept of Enablement

The concept of the enabler is central to an understanding of the occurrence and continuation of alcohol abuse and alcoholism. Most alcoholism rehabilitation programs, including Alcoholics Anonymous, are built around the assumption that the problem lies not only in the alcohol abuser, but also in two way relationships with other individuals who act as enablers. These include spouses, family, friends, and employers who ignore excessive drinking, make excuses for it, offer alcohol as the only drink available or push it at parties; do not challenge the abuser with the fact and effects of his abuse or, once having challenged him, do not follow through consistently with actions that they warned would result from further abuse. Physicians also may be enablers by ignoring either the presence of alcohol or signs and symptoms of abuse, failing to confront the patient with the diagnosis, or in some cases offering addicting drugs or suggesting a "nightcap" as a means for dealing with alcoholic depression, insomnia, or other emotional problems.

Bartenders and restaurant personnel who continue to serve patrons long after they have had too much to drink are also enablers. The purposes of this paper are: to demonstrate that liquor control laws and regulations that were intended to prevent enablement by serving personnel in fact do just the opposite; to recommend an approach that has promise for correcting this problem; and to examine ethical and practical issues relevant to this approach.

Rationale of State Liquor Control Laws

The intent of state laws regulating the manufacture, distribution, sale, and use of alcoholic beverages is to prevent enablement of alcohol abuse. For example, the Vermont statute begins with the provision that its purpose is "to discourage intoxication and encourage temperance" and to promote "the protection of the public welfare, good order, health, peace, safety and morals of the people of the state, and all of its provisions shall be liberally construed for the accomplishment of the purposes set forth herein."[16]

The rationale behind such laws is that limiting the availability of alcoholic beverages or controlling other activities that may occur simultaneously with consumption is believed capable of altering the frequency or severity of alcohol abuse or of harmful effects within the population at large. Control of availability is the only factor yet identified that correlates consistently with prevention of problems associated with alcohol abuse.[17–19] A preventive effect has not generally been found with various programs to educate the public about alcohol and its effects or about how to drink responsibly.[20]

One aspect of availability involves pricing. When the price per consumption unit is raised for drugs such as alcohol or cigarettes, the consumption rate generally drops.[21] Conversely, lowering the price is associated with increased consumption, especially among younger persons, who tend to be less affluent.

Within this general context, five types of anti-enablement laws and regulations can be identified:

1. Limiting times (such as Sunday or Election Day) when alcohol is available, or limiting places (near colleges or schools) where alcohol use is likely to create social problems.
2. Limiting other socially provocative behaviors (e.g.,

nudity or obscene behavior) that might be abetted by use of alcohol in a place where alcohol is served.

3. Prohibiting sales to persons who are perceived to have some inherent greater risk of problems if they consume alcohol. All states set a minimum age for alcohol possession or consumption and some states declare it illegal to serve persons who are known alcoholics, "habitual drunkards", "of notoriously intemperate habits", or similarly inclined. My examination of beverage control statutes for all states revealed that 25 states currently have laws of this type. Such exclusions may extend to persons who are mentally retarded or otherwise mentally impaired (12 states), or who have other attributes believed likely to increase risk of trouble if they drink. Sixteen states have laws permitting prohibition of sales to persons who are in penal institutions, "spendthrifts" or persons unable to support their families, and those addicted to narcotics or who have other special problems or characteristics. Of particular relevance is a Virginia statute prohibiting sale to anyone "convicted of driving or running any automobile, car, truck, motorcycle, engine or train while intoxicated."[22]

4. Limiting size of drinks. In Vermont, for example, no pitcher of malt beverage may contain more than 64 fluid ounces, and no drink may contain more than four fluid ounces of alcoholic beverage (although this "limitation" could actually mean that a person getting four ounces of 100 proof liquor is getting an amount of alcohol equivalent to four standard drinks in a single "drink"). No more than one pitcher or one drink may be served to a person at a time.[23]

5. Prohibiting sale to persons who on any particular occasion have consumed more than is felt to be reasonable. These laws generally are worded as prohibitions against serving persons who are "intoxicated" or "drunk". Only Florida, Nevada, New Jersey, and Wyoming appear not to have laws restricting sales to intoxicated persons. No states have laws or regulations restricting sales according to maximum permissible BAC or number of drinks served.

Despite the intentions stated in these laws, many people are actively served by restaurant and bar personnel to a state of intoxication; alcoholics appear to have no difficulty in obtaining alcohol at such places; and, in some areas, practices such as happy hours are permitted that actively encourage the consumption of alcohol to excess.

A Survey of Current Practices

How are the laws being interpreted and applied? I sent a questionnaire to all state liquor authorities asking how they interpreted relevant terminology in their laws concerning intoxication and alcoholism, what courses or information programs they have for bartenders and other serving personnel, whether they have any limitations on special sales promotions such as "happy hours," the relative frequency of investigations for specific types of enabling behaviors, and the nature of penalties applied. All states completed the questionnaire either by mail or phone.

The agencies' perceptions of themselves and their mandates varied widely. At one extreme are Nevada, which has minimal laws and enforcement capability, and Wyoming, whose commission has no involvement in control of retail activities, leaving this task to local law enforcement agencies. At the other extreme is Virginia, which reports extensive interest and involvement in educational activities.

Four states have no laws limiting the amount of alcohol that a purveyor may serve to a customer, while 40 either make no attempt to define the term intoxication used in their statutes, or define it based on clinically obvious signs such as slurred speech, swaying, stumbling, labile emotions, etc. However, in Delaware, Hawaii, Kansas, Nebraska, and New York a BAC of .10 per cent or higher is reported to have been used at least on occasion as the working definition that an individual is sufficiently under the influence of alcohol and should no longer be served; Utah uses a BAC of .08 per cent. California, on the other hand, requires clinically obvious signs and specifically precludes a BAC determination as evidence of intoxication. While Maine uses the clinical intoxication definition, the person who completed the questionnaire correctly noted that "there is an inherent conflict in the statutes" which permit a licensee to serve a person who has a BAC of .10 per cent or higher and is impaired, yet shows no visible signs of intoxication.

Regarding questions about the proportions of investigations carried out for alleged sales to minors, intoxicated persons, or persons known to be alcoholics, greatest effort went into alleged sales to minors; only 1–10 per cent of investigations were for sales to intoxicated persons in most states. Existing statutes prohibiting sale to alcoholics, persons with mental illness, or other special groups are almost never enforced.

In 21 states information or training is offered by the state agency or another group about the relationship between number of drinks consumed and BAC. In some cases information is also provided about the relationship between BAC and objective impairment. Most state agencies, however, do not consider either training or licensing of serving personnel as important issues. Only eight state agencies currently license or register serving personnel, 11 would like to do so, three have such licensing as local option, and 28 see no need for such licensing.

Idaho's training manual is typical of some of the training materials available that have been produced with assistance of the alcohol beverage industry. It recommends one to two drinks in an hour for small persons, two to three for medium size persons, and three to four for large ones. Supposedly with this "3-2-2 rule of thumb" a medium size person who appears normal could be given 3 drinks the first hour, two the second hour, and two per hour after that and still maintain a target BAC between .04 per cent and .07 per cent.

The general intent of this guide certainly should not be faulted. But, according to most charts of weight and resultant BAC that assume an elimination rate of .015 per cent per hour, this rate of consumption would coincide with the stated target only for the first hour or two and would deviate from the target more and more the longer the person continued to drink. A 160 pound male, for example, drinking for five hours would have 11 drinks and a BAC of .25 per cent minus .075 per cent for metabolic clearance, or .175 per cent. Even assuming he were a very large person, or a heavy drinker with an elimination rate of as much as .025 per cent per hour, the final BAC would still be .125 per cent rather than .04–.07 per cent. Moreover, the definition of a drink is not explicit in this formula, so that it is possible to abuse the rule by serving individuals cocktails or other drinks containing considerably more than the standard drink (0.5 oz of pure alcohol) and still count each as one drink.

While no state agency specifically recommends completely stopping service to patrons who have had more than a stated number of drinks, four do suggest altering the pattern of serving drinks. New Hampshire's staff, for example, recommends that bartenders attempt to "stall" patrons after three or four drinks. Oregon and Delaware recommend

against "stacking", or the lining up of two or more drinks at the end of a "happy hour". Delaware also prohibits the serving of two or more drinks during any half hour period during happy hours, but there is no limit to how long happy hours may extend during the day. Of particular interest is the large number of states (16) that either already have laws or regulations prohibiting happy hours or other forms of sales promotions, or that have such legislation currently pending (22). Only 12 states are not considering legislation of this type.

Finally, almost half (22) of the state agencies report that if illegal service results in injury, the penalty to the purveyor is greater than if no injury results. Six of these agencies indicated that this is a requirement in the state statutes. A few agencies answered yes to this question and made reference to the existence of dram shop laws, which permit civil suit by the injured party aside from criminal sanction applied by the agency itself. It is not clear, however, whether the six state agencies that were included as having statutes were referring to criminal or civil law.

A Proposal

If state liquor control laws are to serve their intended function of promoting moderation and avoiding alcohol-related problems, they must begin to reflect the substantial conceptual and technological changes already described in the field of highway safety. Therefore, the following changes are proposed in state laws and their application.

- The current prohibition found in most state statutes against sale to persons who appear to be intoxicated should be continued because some individuals may show obvious alcohol effects before a BAC of .10 per cent is reached either because of alcohol alone or because of a combination of alcohol and some other drug. In addition to such a prohibition, however, a maximum number of drinks should be designated, based on weight-BAC-impairment relationships above which patrons would no longer be served.

As an illustrative rule of thumb, if a maximum target BAC is set at .15 per cent, persons under 140 pounds could be permitted six to seven drinks over four hours, those between 140 and 200 pounds a maximum of eight to ten drinks, and all persons above that weight no more than twelve drinks (Appendix A). A standard definition should apply for all drinks, e.g., 12 fluid ounces of beer, five ounces of nonfortified wine, three ounces of fortified wine, or 1.5 ounces of 80 proof liquor or its equivalent in higher proof liquors. A time limit could be established to permit persons drinking over a longer time period to consume somewhat more, and should be worded so that a patron would not be able simply to leave a bar, walk around the block, and then return and consume another round of drinks.

- All liquor licensees and their employees who serve alcoholic beverages should be required to learn and demonstrate knowledge of drink-weight-BAC-legal impairment relationships and of the fact that the legal limit for impairment to driving substantially precedes the point at which intoxication usually can be identified. Teaching material should assume elimination of one drink per hour, rather than two or more.
- Appropriate penalties should be established and applied for failure to meet the above requirements.
- "Happy hour" discounts, two-for-one sales, and other reduced prices for drinks should be abolished, especially the sale of unlimited numbers of drinks for a set price. If anything is to be offered as an enticement to customers it should be food, because if consumed either with or just before alcohol, it will reduce the peak BAC by one-fourth to one-third.[24]
- Some states have more severe penalties for "driving while impaired" (DWI) convictions if injury or fatality results than if less serious outcome resulted. Similarly, if licensees serve customers inappropriately and injury results this should evoke more severe penalty under state statute than if no damage occurs.
- In determining whether a purveyor has served a customer too much, a BAC exceeding a specified amount (e.g., .10 per cent or .15 per cent) should be considered presumptive evidence of excessive consumption.

Ethical Issues

The major ethical issue raised by this proposal is the extent to which the public good is to be achieved at the cost of individual liberties and vice versa. In American society both values are considered important, and they often come into conflict—for example, with the compulsory wearing of motorcycle helmets or seat belts, or the establishment of a 55 mile per hour speed limit. In each of these cases, most courts have given higher priority to the public safety.

Concerning the limitation of drinks, the argument of public need is compelling, because the person who has a BAC above .10 per cent or .15 per cent is much more likely to injure not only himself, but also other people through crashes, assault, or home fires that may wipe out occupants of an entire building. The exact BAC is less important than the fact that the chosen level should reflect the scientific knowledge that has accumulated over the past several decades and that prescientific terminology should be discarded.

With almost unlimited availability of alcohol, some drinkers will not—or, in the case of the alcoholic, currently cannot—control their amount or rate of consumption. Therefore, other approaches must be used to supplement—but not to replace—attention to the drinker. These other approaches include, on one hand, reduction of enablement and, on the other hand, environmental interventions to lessen harmful effects of deviant actions.[25]

Mäkelä and Room point out that in recent years there has been a shift toward "a de facto policy of encouraging alcohol consumption and organizing our social life around it, while stringently penalizing the individual deviant drinker. . . . Apart from the [limited] effectiveness of such a policy, it seems to us ethically unattractive for a society to assume no collective responsibility for the occurrence of drunken deviance, to treat an act such as drinking, which is essentially social and potentially habit-forming, as if it were solely a matter of time-by-time personal choices."[26]

Questions about Usefulness and Feasibility

As the data in Table 1 demonstrate, a large majority of persons with alcohol in almost all types of fatal injury events have BACs of .10 per cent or higher. Furthermore, a recent review by O'Donnell of 11 studies of location of alcohol consumption of drivers who had been drinking revealed that, on average, 53 per cent had been drinking at commercial establishments.[27] These studies involved post-crash and post-arrest surveys, and roadside surveys of drivers with BACs of .10 per cent or higher.

There are limits to what can be done about the bar hopper. Semi-quantitative BAC test tubes are available commercially for about $1.50 retail. Enabling statutes could

permit bartenders to require such testing at the patron's cost if there is any question about prior alcohol consumption. The cost to the customer is less than the price of one drink and can help offset the possible loss of income to the bar resulting from sale of fewer drinks.

Some available data concerning drinking behaviors in public establishments suggest that such a law would not create an undue financial hardship for bars and restaurants. Storm and Cutler report, for example, that about 9 per cent of men and 4 per cent of women at beer parlors in Vancouver, British Columbia consumed more than eight drinks, whereas no men or women did so at cocktail lounges.[28] Although their study was undertaken in Canada, drinking practices probably do not differ appreciably from those in much of the United States. Based on these data (Appendix B), it is estimated that in general a .15 per cent cutoff should mean a net financial loss of considerably less than 5 per cent for most establishments and perhaps up to 12 per cent for those few places that cater to a heavy drinking crowd. These are precisely the places, howver, that tend to have happy hours and other discounts, and removal of such lower prices across the board might well mean greater revenue per drink. This might balance out the fact that fewer drinks are being sold.

The ultimate question about feasibility concerns the ability to enforce such laws or regulations, because no law can be any more effective than the extent to which it is applied. The fact that a major shift toward emphasizing more responsible drinking practices appears to be occurring not only in the United States but in a country like Australia, where heavy drinking has been a norm, suggests that public support for such laws is probable.

Furthermore, in England, arrest rates for alcohol-related disturbances in a community where the police made a show of amicably visiting liquor purveyors regularly to "check things out" were considerably lower than in a similar community where such enforcement did not occur.[29] Any increase in police effort to do such checks would be more than balanced by the reduction in difficult and potentially dangerous arrests for violence and other alcohol-related crimes. Similar experience has been reported by police in Galveston, Texas in their attempts to control alcohol consumption on beaches through frequent friendly tours through the area.**

**Comments by Galveston, TX Chief of Police and other department members at Conference on Community Injury Control: The Beachfront Community, Galveston, TX Oct. 2–4, 1985.

APPENDIX A
BAC by Weight and Number of Drinks after Drinking for Four Hours at Elimination Rate of 0.015 per cent per hour

	Weight (lbs)						
# Drinks	120	140	160	180	200	220	240
6	.13	.10	.08	.07	.05	.04	.03
8	.19	.15	.13	.11	.09	.08	.07
10	.25	.21	.17	.15	.13	.11	.10
12	.31	.27	.21	.19	.17	.15	.14

Most tables such as this are based on alcohol consumption by males. Because women on average have more body fat than do men, the compartmentalization of alcohol in body fluids differs somewhat and on average they will have modestly high BACs per drink than indicated by such tables.

APPENDIX B
Estimated Number and Per Cent of Drinks above Eight per Person Consumed in Beer Parlors

# Drinks	(assumed for calculations)	X % of Males	(% of Females) =	$\bar{X}$ Drinks Males	($\bar{X}$ Drinks Females)
0–1	(.8)	15	(27)	.120	(.216)
2–3	(2.5)	33	(37)	.825	(.925)
4–5	(4.5)	23	(21)	1.035	(.945)
6–7	(6.5)	16	(8)	1.040	(.520)
8–9	(8.5)	8	(5)	.680	(.425)
10–11	(10.5)	3	(2)	.315	(.210)
≥12	(13)	2	(0)	.240	(0)
				4.255*	3.050*

For males, the estimated mean number of drinks above 8 was .895 or 21 per cent of all drinks consumed. For females, the estimate was .21, or 7 per cent of all drinks consumed. Since males were 72.3 per cent of the 473 patrons surveyed at four locations, the total estimated reduction in sales would be 15.2 per cent (or .21 × .723) plus 1.9 per cent (or .07 × .277), or 17.1 per cent, assuming that none of the men weighed more than 200 lbs and none of the patrons stayed more than four hours. A more logical figure for beer parlors would be about 10–12 per cent sales reduction within the drink-weight-time criteria described in the proposal.

*(actual $\bar{X}$ drinks in study were 4.3 and 3.3).

APPENDIX B (continued)
Estimated Number and Per Cent of Drinks above Eight per Person Consumed in Cocktail Lounges

# Drinks x	% of males	(% of females) =	$\bar{X}$ Drinks Males	($\bar{X}$ Drinks Females)
0–1	42	(45)	.336	(.360)
2–3	50	(48)	1.250	(1.200)
4–5	5	(5)	.225	(.225)
6–7	4	(3)	.260	(.195)
8–9	0.2	(0)	.017	(0)
10–11	0	(0)	0	(0)
≥12	0	(0)	0	(0)
			2.088*	1.98*

Drinks above eight were .009, or .04 per cent of all drinks among 836 patrons at four establishments.

*(actual $\bar{X}$ = 2.0 and 1.9).

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