

OUR THINKING ABOUT DRINKING

The Issues Forum

BLOOD ALCOHOL CONCENTRATION (BAC) LIMITS

DEFINITION

Blood Alcohol Concentration (BAC) is represented by the amount of ethanol in a given amount of blood. It is measured as either grams of ethanol per deciliter of blood (g/dl, commonly used in the United States), or milligrams of ethanol per milliliters of blood, (mg/ml, used in much of Europe). For the purposes of this discussion, we will refer to the g/dl measurement.

Although there are various ways to determine an individual's BAC level, the most common and inexpensive way to measure the level of alcohol is an exhaled breath sample. BAC levels are influenced by a number of factors, from the amount of alcohol consumed to the time frame in which it was consumed, as well as absorption and metabolic rates, body weight, gender, food intake, and drinking patterns.¹

In addition, for the purposes of this discussion, the phrase "repeat offenders" will be understood to mean individuals convicted twice or more of drunk driving offenses. (For similar and additional related content, see The Issues Forum entry on Drunk Driving.)

BACKGROUND & THE ISSUE

This is a particularly critical topic because of the high rates of alcohol-related traffic deaths every year around the world. From a policy perspective, issues related to BAC limits tend to focus on disparities amongst legal limits, inconsistent or ineffective enforcement of limits, and the relationship of BAC limits to harmful behaviors associated with alcohol abuse—chief among them, impaired driving and its often tragic consequences.

THE RESEARCH

BAC LEVELS, IMPAIRMENT, & FATAL TRAFFIC ACCIDENTS

Alcohol consumption is known to affect an individual's motor skills, and to slow an individual's reaction time when performing a precision activity such as driving a motor vehicle.² The impairments that result when a driver is intoxicated range from slowed reflexes to blurred vision and poor judgment of distance, speed, and possible hazards. The reaction time of a drunk driver, compared to a sober driver, can be reduced by up to 30 percent.³

It is well-documented that a driver's risk of being involved in a fatal traffic accident increases with the amount of alcohol consumed. Traffic accident statistics show a clearly escalating level of risk as BAC levels increase.

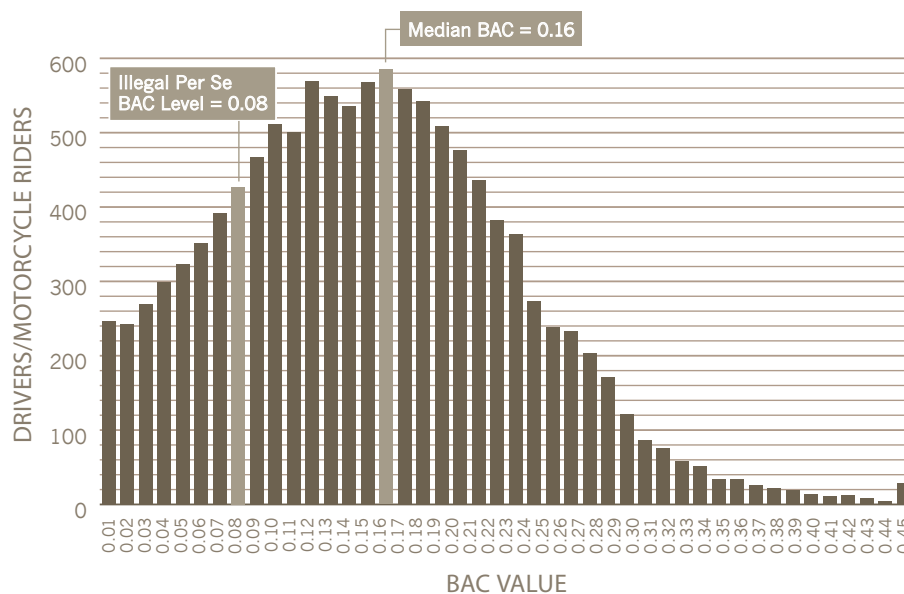
TABLE 1 EFFECTS OF BLOOD ALCOHOL CONCENTRATION (MEASURED AS G/DL)

0.02 - 0.03	Few obvious effects; slight intensification of mood.
0.05 - 0.06	Feeling of warmth, relaxation, mild sedation; exaggeration of emotion and behavior; slight decrease in reaction time and in fine-muscle coordination; impaired judgment about continued drinking.
0.07 - 0.09	More noticeable speech impairment and disturbance of balance; impaired motor coordination, hearing and vision; feeling of elation or depression; increased confidence; may not recognize impairment.
0.11 - 0.12	Coordination and balance becoming difficult; distinct impairment of mental faculties and judgment.
0.14 - 0.15	Major impairment of mental and physical control; slurred speech, blurred vision, and lack of motor skills; needs medical evaluation.
0.20	Loss of motor control; must have assistance moving about; mental confusion; needs medical assistance.
0.30	Severe intoxication; minimum conscious control of mind and body; needs hospitalization.
0.40	Unconsciousness; coma; needs hospitalization

Source: Federal Aviation Regulation (CFR) 91.17 commentary as reported at <http://www.flightphysical.com/pilot/alcohol.htm>.

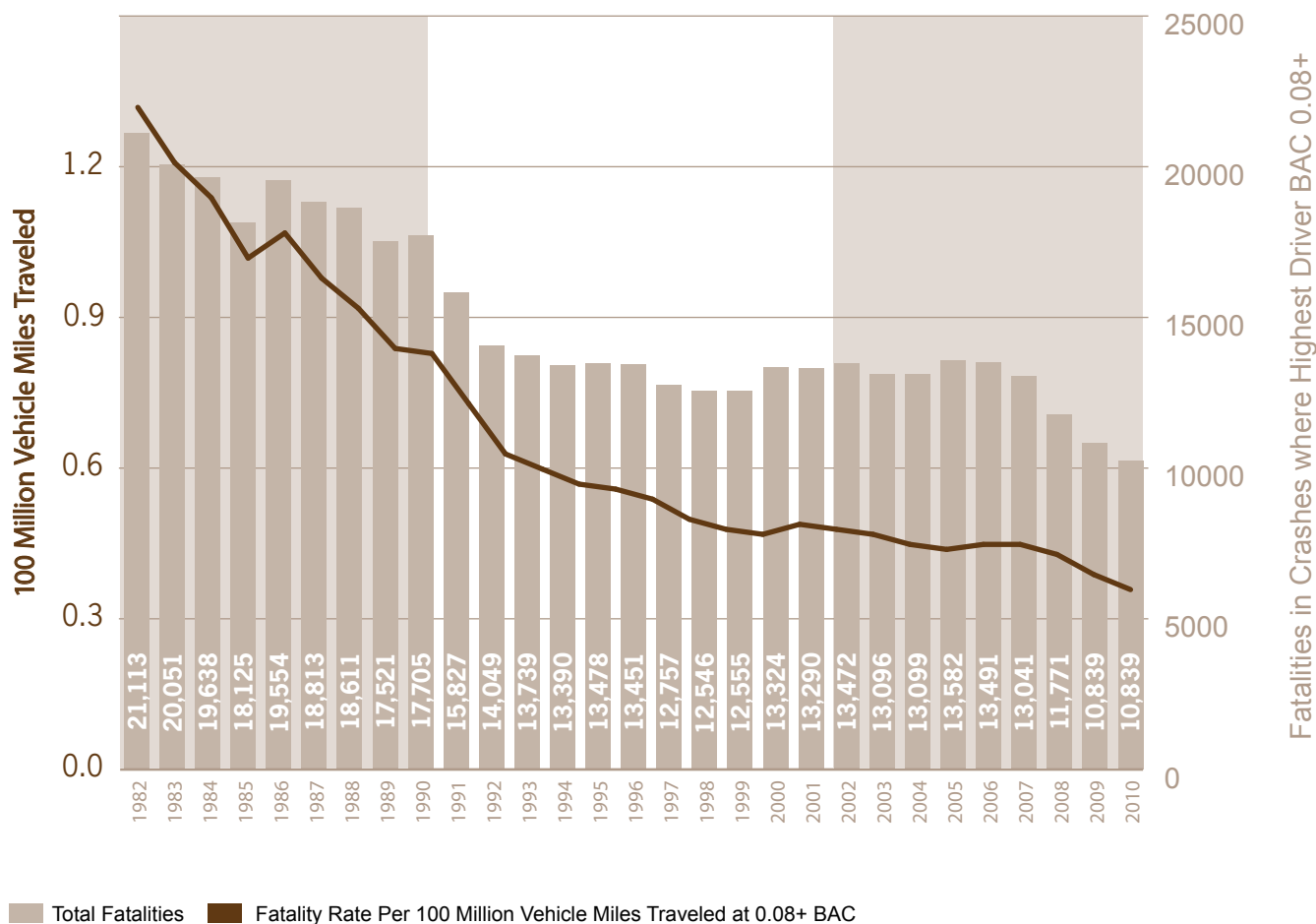
In the United States alone, alcohol-impaired traffic fatalities account for 31 percent of all traffic fatalities. Although alcohol-impaired traffic fatalities declined during the two decades spanning from 1986 to 2006 in the U.S.,ⁱⁱⁱ On average, someone is killed in an alcohol-related traffic accident approximately every 45 minutes. In 2010, 10,228 people died in alcohol-related traffic crashes in the United States.^{iv}

TABLE 2 DISTRIBUTION OF BAC VALUES AMONG DRIVERS AND MOTORCYCLE RIDERS WITH POSITIVE BAC VALUES IN FATAL CRASHES IN U.S. (NHTSA 2010)



Data Source: NHTSA/FARS/DOT HS 811 016

TABLE 3 U.S. ALCOHOL-IMPAIRED DRIVING FATALITIES AND FATALITY RATE PER 100 MILLION VMT: 1982 TO 2010



Although the losses remain too high, alcohol-impaired driving fatalities in the U.S. have declined 49 percent from 1982 to 2010. While Americans have driven more during this period, the fatality rate per vehicle mile traveled (VMT) has declined steadily as well.

BAC LEVELS WORLDWIDE

The vast majority of jurisdictions worldwide attempt to minimize the harms caused by impaired driving by setting maximum legally permissible BAC levels for drivers. These maximum legal BAC levels range from .00 g/dl to .08 g/dl. (See Appendix I for a complete listing of BAC limits worldwide.) According to a WHO survey published in 2004:

- 28 percent of countries set the legal BAC limits between 0.0 and .03 g/dl;
- 39 percent of countries set the legal BAC limits between .04 and .06 g/dl; and
- 26 percent of countries have adopted limits above .06 g/dl.⁶

In addition to variations in BAC limits from country to country—including some nations with no governmentally-imposed BAC limit—research shows that countries vary in terms of the penalties they impose for violations of legal BAC limits, and the extent to which such limits are communicated and enforced.

APPENDIX I: BLOOD ALCOHOL CONCENTRATION (BAC) LIMITS WORLDWIDE

COUNTRY	STANDARD BAC (in mg/ml)	COUNTRY	STANDARD BAC (in mg/ml)	COUNTRY	STANDARD BAC (in mg/ml)
Albania	0.01	Georgia	0.03	Norway	0.02
Algeria	0.01	Germany	0.05	Panama	0
Argentina	0.05	Greece	0.05	Paraguay	0.08
Armenia	0	Guatemala	0.08	Peru	0.05
Australia	0.05	Honduras	0.07	Philippines	0.05
Austria	0.05	Hungary	0	Poland	0.02
Azerbaijan	0	Iceland	0.05	Portugal	0.05
Belarus	0.05	India	0.03	Romania	0
Belgium	0.05	Ireland	0.08	Russia	0.03
Bolivia	0.07	Israel	0.05	Singapore	0.08
Bosnia & Herzegovina	0.05	Italy	0.05	Slovak Republic	0.02
Botswana	0.08	Japan	0.03	Slovenia	0.05
Brazil	0.0	Kenya	0.08	South Africa	0.05
Bulgaria	0.05	Kyrgyzstan	0.05	South Korea, Rep. of	0.052
Cambodia	0.05	Latvia	0.049	Spain	0.05
Canada	0.08	Lithuania	0.04	Sweden	0.02
Colombia	0	Luxembourg	0.08	Switzerland	0.05
Costa Rica	0.049	Macedonia	0.05	Thailand	0.05
China	0.05	Malaysia	0.08	Turkey	0.05
Croatia	0.05*	Malta	0.08	Turkmenistan	0.03
Czech Republic	0	Mauritius	0.05	Uganda	0.05
Denmark	0.05	Mexico	0.08	United Kingdom	0.08
Ecuador	0.07	Moldova	0.03	United States	0.08
El Salvador	0.05	Mongolia	0.02	Uruguay	0.03
Estonia	0.02	Nepal	0	Venezuela	0.05
Ethiopia	0	The Netherlands	0.05	Zimbabwe	0.08
Finland	0.05	New Zealand	0.08		
France	0.05	Nicaragua	0.08		

Source: International Center for Alcohol Policies, updated January 2009

*BAC for professional drivers and drivers under 24 years of age is .010 g/dl.

**BAC for bus and truck drivers is .00 g/dl.

***BAC for professional drivers is .02 g/dl.

SPECIAL CONSIDERATIONS

Some countries impose a lower legal BAC limit for younger or less experienced drivers. This is in part in response to research which shows that for young and less experienced drivers, smaller increases in BAC levels can raise the risk of tragic consequences such as fatal traffic accidents (more so than for older, more experienced drivers). The countries which impose lower legal BAC limits for younger or less experienced drivers include Australia, Austria, Canada, Macedonia, New Zealand, Russia, Slovenia, Spain, and the United States.⁷

More stringent BAC limits are also set by some jurisdictions for people who operate commercial vehicles, airline pilots, captains of ships, and people who drive vehicles such as taxis, trucks, and buses. In addition, in some countries, BAC limits extend beyond drivers of automobiles to operators of various types of other vehicles, including personal aircraft, snowmobiles, and even bicycles.⁸

There is a body of research which identifies repeat drunk driving offenders and “hardcore” drunk drivers as a large and disproportionate source of highway crashes. As defined by The Century Council and the National Hardcore Drunk Driver project in the United States as well as other organizations and government entities, a hardcore drunk driver is someone who (1) drives with a BAC level of .15 g/dl or above and/or (2) drives repeatedly while intoxicated (e.g., as demonstrated by having more than one arrest for doing so).⁹ For example, in the United States, each year, as many as 40 percent of fatally injured drinking drivers were previously convicted of drunk driving offenses—and out of those 40 percent, as many as 80 percent had BAC levels of .15 g/dl or more.¹⁰

Additionally, there is growing public awareness about the dangers of driving after drinking when in a so-called “buzzed” state (meaning at or just above the legal BAC limit) versus being overtly drunk. Recent advocacy campaigns addressing this phenomenon include the Ad Council’s “Buzzed Driving is Drunk Driving” campaign.¹¹

POLICY CONSIDERATIONS

Measures have been instituted by jurisdictions worldwide in an attempt to reduce the incidence of alcohol-related traf-

fic accidents and to prevent those who are intoxicated from driving. In the United States, all 50 states and the District of Columbia have passed legislation establishing that a driver with a BAC of .08 g/dl is considered legally intoxicated. In addition, 39 states and the District of Columbia have laws and penalties targeted at those who drive with elevated or “high” BAC levels, generally .15 g/dl.

In the European Union, where more than nearly 10,000 deaths are caused by drunk driving-related accidents every year, the European Commission’s recently adopted platform for reducing alcohol-related harm includes reducing injuries and deaths from alcohol-related road accidents. The effort, which seeks to reduce the number of fatal accidents by 50 percent by 2010, calls for a zero BAC limit for new drivers, as well as for professional commercial vehicle drivers and bus drivers.¹²

DUI COURTS

DUI Courts (sometimes called DWI Courts) deal with hardcore drunk driving offenders by providing long-term accountability and rehabilitation in addition to conviction. The DUI Court model was first implemented on a trial basis in the U.S. in the 1990s, and is designed to protect public safety by addressing the root causes of repeat DUI offenders/hardcore drunk drivers. This entails a cooperative approach involving all criminal justice stakeholders (prosecutors, defense attorneys, judges, probation officers, law enforcement). In addition to being convicted, offenders typically enter into court-ordered treatment, undergo frequent alcohol testing, and are under close community supervision. Recent research results show that a Wisconsin program is credited with reducing recidivism by nearly 50 percent, and that a Maryland program reported an eight percent recidivism rate after five years, compared to a 35 percent rate for other programs.¹³

ADMINISTRATIVE LICENSE REVOCATION

In addition to penalties which involve the revocation of driving privileges following a conviction for driving while intoxicated, Administrative License Revocation (ALR) involves the immediate revocation of a driver’s license when he or she is arrested for driving while intoxicated. Typically, this type of license suspension is implemented if (1) the driver refuses a BAC breath test but the law enforcement officer on

hand deems there is cause for arrest based on impairment; or (2) if a breath test is administered and reflects a BAC level above the legal limit. Advocates of ALR promote the practice as a rapid and effective response which helps to keep the roads safe for other drivers. Currently in the U.S., 41 states and the District of Columbia have laws allowing for Administrative License Revocation.¹⁴

PUBLIC EDUCATION

Although the majority of nations have established legal BAC limits, levels of public education and government enforcement vary greatly. Yet research suggests that factors such as increased education and information about BAC limits and the dangers of driving while impaired can play a key role in enhancing the effectiveness of legislation which targets drunk driving.¹⁵ Public education campaigns to promote understanding of BAC limits—whether implemented through governments, local communities, advocacy groups, and/or the beverage alcohol industry—have demonstrated positive results.¹⁶

ENFORCEMENT AND PUNISHMENT

Consistent and visible enforcement has been shown to be a powerful deterrent to impaired driving. Enforcement methods which have proven effective include breath testing (random or where impairment of a driver is suspected), sobriety checkpoints, police patrols, and officer training.¹⁷ However, 30 percent of countries do not use random breath tests to enforce BAC limits. Of the countries that report using random breath tests, only 23 percent rely on this enforcement method frequently, 32 percent use it only sometimes, and 16 percent employ it rarely.¹⁸ In addition, studies show that greater enforcement can occur effectively in hospital emergency rooms, where relatively few drivers with BAC levels testing over the legal limit are arrested or punished.¹⁹

Punishment for convicted drunk drivers also varies a great deal from country to country, and in some jurisdictions, is linked to the extent to which an offender's BAC level exceeds the legal limit. Generally speaking, the consequences for exceeding legally imposed BAC limits range from mandatory educational programs and monetary fines to more severe measures such as automatic license suspension and prison sentences.²⁰

IGNITION INTERLOCK DEVICES

Ignition Interlock devices—BAC breath testing devices linked to a vehicle's ignition system—require that a driver take a breath test before being allowed to start the vehicle's engine. The vehicle will not start unless the driver's BAC is below a pre-set level, and the interlock system tracks each attempt to start the vehicle. In addition, interlock devices can be calibrated for "rolling re-tests" which require a driver to provide breath tests at regular intervals—thus preventing drivers from circumventing the device by asking a sober friend to start the car, drinking while driving, leaving the car idling while going into a bar to drink, etc.²¹

BROWN-FORMAN COMMENTARY AND POSITIONS

Maximum legal BAC limits vary around the world, as do countries' and communities' commitments to (1) promoting public education about BAC limits, (2) consistent and effective enforcement of legal BAC limits, and (3) punishments for drivers whose BAC levels are found to be above the legal limit.

Research consistently shows that compliance with—and enforcement of—BAC limits helps to reduce the number of accidents caused by impaired drivers. For legislated BAC limits to effectively help reduce the number of accidents and injuries caused by alcohol-impaired drivers, a key factor is the commitment of governments and communities to public education, compliance, and enforcement.

In addition to education and prevention efforts, certain approaches have demonstrated sufficient levels of success for broad legislative adoption in the United States—namely, Administrative License Revocation and stiffer penalties for repeat offenders and offenders with higher BAC levels.

BASED ON THESE FINDINGS AND OBSERVATIONS, BROWN-FORMAN SUPPORTS AND ENCOURAGES A COMPREHENSIVE APPROACH TO DRUNK DRIVING PREVENTION, INCLUDING:

In all jurisdictions, the establishment of clearly defined legal BAC levels of at least .08 g/dl

Sound scientific research shows that 0.08 is the level at which virtually every driver is impaired – affecting all of the critical driving skills including braking, steering, judgment, and response time.

The establishment of zero-tolerance BAC levels for drivers who are under the legal drinking age

DUI Courts with an approach that combines conviction with court-ordered treatment, frequent alcohol testing, and close community supervision

This cooperative approach involves all criminal justice stakeholders (prosecutors, defense attorneys, judges, probation officers, law enforcement) and is designed to protect public safety by addressing the root causes of hardcore drunk driving.

Court-ordered Ignition Interlock devices for hardcore drunk drivers (repeat impaired-driving offenders and/or drivers with a BAC of .15 g/dl or higher)

More specifically, we support Ignition Interlock ordered at a judge's discretion for the first impaired driving offense, and as a mandatory consequence for second-time offenders.

For third-time offenders found guilty of driving while intoxicated, a mandatory felony trial—and felony sentencing if the offender is found guilty

In addition, for repeat offenders, we support court-ordered treatment for alcohol abuse (not as a substitute for penalties, but in addition to other sanctions).

The implementation of Administrative License Revocation (immediate revocation of a driver's license upon arrest for drunk driving)—and adoption of ALR in all jurisdictions

We endorse ALR as a swift and highly effective means of getting drunk drivers off the roads.

Consistent enforcement of BAC limits

We encourage the use of measures ranging from breath testing to testing in hospital emergency rooms following accidents in which alcohol may be involved.

We also support robust police training with regard to BAC enforcement, and the reallocation of adequate resources to effectively enforce BAC legislation.

Improved judicial training

Impaired driving offenses involve a distinct set of concerns with regard to law enforcement procedures, BAC levels, the details of BAC testing, etc. Officers of local courts should be provided with training which addresses these details.

Increased promotion of public education about BAC limits and the dangers of drunk driving

We encourage a coordination of initiatives to promote education about legal BAC limits through the engagement of a broad range of partners, including government authorities, police, the hospitality industry, advocacy groups, industry groups, community groups, and schools.

Such initiatives should address what certain BAC levels mean for individuals in terms of the number of drinks consumed, the dangers of drunk driving, and the penalties for drivers whose BAC levels exceed legal limits.

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- ⁴ See: <http://www.centurycouncil.org/learn-the-facts/drunk-driving-stats>.
- ⁵ See: <http://www.centurycouncil.org/learn-the-facts>.
- ⁶ World Health Organization (WHO). (2004). *Global status report: Alcohol policy*.
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- ⁹ See: <http://www.centurycouncil.org/fight-drunk-driving/initiatives/hardcoredrunkdriving>.
- ¹⁰ See: www.dwidata.org.
- ¹¹ See: <http://www.adcouncil.org/default.aspx?id=49>.
- ¹² Road Safety: European Parliament says more action needed; see www.europarl.europa.eu/news/expert/infopress. Call for an EU-wide zero alcohol limits for new and professional commercial drivers; see www.europarl.europa.eu/news/expert/infopress.
- ¹³ National Highway Traffic Safety Administration (NHTSA). See: <http://www.nhtsa.dot.gov/staticfiles/DOT/NHTSA/Communication%20&%20Consumer%20Information/Articles/Associated%20Files/810879.pdf>.
- ¹⁴ MADD, See: <http://www.madd.org/Professionals/Law-Enforcement/Research/View-Research.aspx?research=19>. See also: <http://www.centurycouncil.org/content/state-federal-policy-agenda-0>.
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- ²⁰ International Center for Alcohol Policies. (2002). Blood alcohol concentration limits worldwide. ICAP Report 11.
- ²¹ MADD, Alcohol Ignition Interlock Fact Sheet at www.madd.org/getattachment/f3b10778-9a12-4176-adba-3644f153ee7e/Alcohol-Ignition-Interlock-Fact-Sheet.aspx.