

## Reducing Drink Drive Accidents: A Review

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### Abstract

A strong evidence-based case is made for a reduction in the drink driving blood alcohol concentration (BAC), currently in the UK 80 mg to 50 mg per 100 ml which worldwide has been shown to decrease the number of drink driving including fatal accidents. An even lower BAC of 20 mg per 100 ml is recommended for the younger novice representing 7% of driving licence holders in the UK but involved in 20% of fatal and serious collisions. The danger of binge drinking and of combining alcohol with other drugs such as cannabis and marijuana is emphasised and the harmful influence of simple energy drinks when combined with alcohol. The review also emphasises the need for enhanced police enforcement and more public awareness campaigns which to date have indicated growing public support for reducing the drink driving limits.

**Key words:** Blood alcohol, drink driving, public awareness, cannabis/other drugs

### Introduction

According to United Kingdom Department for Transport data, 13% of road traffic accidents in the UK involve alcohol. In 2018 around 5% of all reported road traffic accidents involved at least one driver or rider over the drink legal alcohol limit and between 220 and 270 people were estimated to have been killed in drink drive accidents compared with 200 in 2015. The total number of drink-drive accidents rose by 4% to 5,900 and an estimated 8,700 people were killed or injured when at least one driver was over the drink-drive limit. This represents an increase of 1% from 8,600 in 2017[1].

### BAC levels worldwide

In the majority of countries worldwide, lowering of the Blood Alcohol Concentration (BAC) to a 50 mg per 100 ml limit has been found to be an important tool in reducing the number of drink driving accidents. A meta-analysis of studies in the USA found a 11.1% decline in fatal alcohol-related crashes on lowering the BAC from 80 mg to 50 mg per 100 ml [2]. In Austria a landmark study showed a reduction from 80 to 50 mg per 100 ml resulted in a 9.4% decrease in alcohol related crashes and in France this was shown to lower the number of deaths from 100 to 64 in the first year after introduction [3,4]. The same reduction in level in Queensland, Australia, resulted in a 18% reduction in fatal crashes and a 14% reduction in serious crashes and in New South Wales an 8% reduction in fatal cases and a 7% reduction in serious crashes [5,6,7].

Some countries have adopted even lower levels. Sweden's experience was positive in that lowering the legal limit to 20 mg per 100 ml on 1st July 1990, resulted in the 6 years following this to a 9.7% reduction in fatal and single vehicle crashes and a further study by Borschos showed a 10% decrease in fatal crashes [8, 9]. In Japan a reduction as in the BAC

limit from 50 to 30 mg per 100 ml in 2002, was accompanied by a statistically significant reduction in alcohol involved motor vehicle crashes [10]. Similarly, in Southern Taiwan a reduction from 50 to 30 mg per 100 ml in 2013 was responsible for reducing the numbers driving under the influence [11]. However, there are some exceptions including Scotland where the reduction of the BAC to 50 mg per 100 ml in December 2014 was not associated with a reduction in road traffic accidents and in New Zealand where there was an increase in the numbers of deceased drivers and motorcyclists positive for alcohol alone and in those co-using alcohol and drugs [12,13].

### Additional measures required

An analysis of Adult Drinking Habits in Great Britain showed a strong correlation in young people aged 16 – 24 years between binge drinking and driving accidents. Although this age group is less likely to drink than any other age group, when alcohol was consumed it was often at binge drinking levels [14]. This is likely to be the main reason for this age group, which represents only 7% of the UK's driving licence holders being involved in 20% of fatal and serious collisions [15]. In a study from the US, more than 1 in 4 motor vehicle crash fatalities among children, adolescents, and young adults less than 21 years old were alcohol related [16]. Most European jurisdictions have imposed a lower drink drive limit of 20 mg per 100 ml for novice drivers and adoption of this level in the US was shown to result in an average 24.4% reduction in alcohol positive drivers younger than 21 being involved in fatal crashes [17].

Reducing the alcohol-driving limit needs to be accompanied by additional coercive mechanisms to obtain maximum effect. These include raising the legal drinking age, Graduated drivers' licensing for youth, Responsible-Beverage-Service Training and Enforcement, Night-time Driving and Passenger Restrictions for Young Drivers, media and

enforcement campaigns, and Zero-Tolerance Laws for Novice Drivers[18]. How best to deal with the serial offender is a particular problem. In Ireland with a drink drive limit of 50 mg per 100 ml for specified drivers, the figure of 61,874 drink drive offences in 2008 to 2012 for those who had had at least two drink drive offences included 4,500 had two offences, 873 three, 249 four, 87 five and 65 more than six offences[19].

Furthermore, there is a misconception concerning the safety of levels even as low as 20 mg per 100 ml which can have a measurable impact with the driver feeling relaxed and with an altered mood the tendency was to make poor judgements. At levels of 50 mg per 100 ml, there can be evidence of exaggerated behaviour and some loss of the ability to focus the eyes so vision can become blurry. Visual tracking of objects becomes more difficult and there is a reduction in the ability to respond to emergency situations. At the current legal level of 80 mg per 100 there is evidence of a loss of co-ordination with impairment of balance, speech reaction times, and even hearing[20]. Two recent studies including a meta-analysis have demonstrated the extent of impairment in performance variables including accelerating and braking behaviours when drivers were under the influence of alcohol[21,22].

### Combined effect of alcohol and other stimulants

Contributing substantially to the present accident profile is the fashion currently in young age groups and those in middle life of combining alcohol with other stimulants. An assessment of individual and joint effects of alcohol and marijuana on fatal two-vehicle crashes showed an odds ratio of 6.39 for those testing positive for both agents [23]. A landmark study from Metropolitan France in 2011 of cannabis and alcohol found that the risk of causing a fatal accident was increased by 19.7 times for drivers under the influence of alcohol, this being multiplied by 3.45 for those taking cannabis as well, and by 2.2 for those under the influence of opiates [24]. The combined use of alcohol and energy drinks is particularly worrying. Users are more likely to drive whilst knowingly drunk and participate in other high risk behaviours such as heavy drinking that increase the potential for injury [25,26]. The prevalence of prescription opioid use among drivers has increased markedly in the past 2 decades. In one analysis, concurrent use of prescription opioids and alcohol was associated with adjusted ORs of 1.97 to 8.2 for the risk of crash involvement [27]. With the greater use of medicinal cannabis, driving under the influence of cannabis (DUIC) is increasingly common. A study of DUIC showed 56% of the sample driving within 2 h of use with 51% of the drivers a little 'high' and 21% driving when 'very high'[28]. Similar data has been reported from the USA with 49% of the drivers killed in crashes who tested positive for alcohol also testing positive for drugs[29].

As driving under the influence of drugs has become more prevalent, legislation has been introduced to limit this harm. Changes to the offence of drug driving came into force in England and Wales from March 2nd 2015. Regulation 2 of the Drug Driving (Specified Limits) (England and Wales) Regulations 2014 made it illegal to drive with specified blood levels of certain drugs including legal medication which mean that a driver can be guilty of an offence of drug driving even if their ability to drive apparently is not impaired. This was altered because the burden of proving driving impairment was problematic for prosecutors.

### Conclusion—Public Awareness

Finally, with respect to the UK; the RAC has reiterated its call for the government to reduce the legal blood alcohol concentration to 50 mg per 100 ml [30]. Some organisations including Brake, the road safety charity, consider that such a reduction does not go far enough in tackling current levels of drunk driving and are campaigning for a UK wide limit of 20 mg

per 100 ml. In effect the latter is a zero-tolerance policy and will need to be accompanied by enhanced police enforcement and more public awareness campaigns. Current surveys indicate growing public support for a reduction in the drink drive limit. In one, more than 78% of respondents answered that the current limit was too high and 54% of respondents thought that this should be reduced to 20 mg per 100 ml [31].

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### References

1. Reported road casualties in Great Britain: provisional estimates involving illegal alcohol levels: 2018.
2. Fell JC, Scherer M.( 2017) Estimation of the Potential Effectiveness of Lowering the Blood Alcohol Concentration (BAC) Limit for Driving from 0.08 to 0.05 Grams per Deciliter in the United States. *Alcohol Clin Exp Res.*;41(12):2128–2139.
3. Bartl G, and Esberger R. (2000) Effects of lowering the legal BAC-limit in Austria. In H Laurell and F Schlyter (Eds) Proceedings of the 15th International conference on alcohol, drugs and traffic safety. May 22-26 2000 Stockholm, Sweden: International Council on Alcohol, Drugs and Traffic Safety (ICADTS).
4. Mercier-Guyon C. (1998). Lowering the BAC limit to 0.05: results of the French experience. Paper presented at the Transportation Research Board 77th Annual Meeting, January 11–15, Washington, DC.
5. Smith DI. (1988) Effect on traffic safety of introducing a 0.05% blood alcohol level in Queensland, Australia. *Med Sci Law.* Apr;28(2):165-170.
6. Henstridge J, Homel R, Mackay P (1995) The long-term effects of random breath testing in Adelaide. In CN Kloeden, AJ McLean (eds.): Proceedings of the 13th International Conference on Alcohol, Drugs and Traffic Safety-T'95, Aug 13–18, 1995. International Council on Alcohol, Drugs and Traffic Safety (ICADTS), Adelaide, Australia.
7. Hestridge J, Homel R, and Mackay P (1997) Long-term effects of random breath testing in four Australian States: A time series analysis. Published (Canberra) Federal Office of Road Safety, Australia, 1 – 134.
8. Norström T, Laurell H (1997) Effects of the lowering of the legal BAC limit in Sweden. In: Mercier-Guyon, C. (Ed.), Alcohol, Drugs and Traffic Safety — T'97. Centre d'Etudes et de Recherche en Medicin du Traffic, Annecy, France, pp. 87–94.
9. Borschos B, (2000) An evaluation of the Swedish drunken driving legislation implemented on February 1, 1994. Paper presented at the International Conference on Alcohol, Drugs and Traffic Safety, May 22–26, Stockholm.
10. Nagata T, Setoguchi S, Hemenway D (2008) Effectiveness of a law to reduce alcohol-impaired driving in Japan. *Injury Prevention*;14:19-23.
11. Tsai YC, Wu SC, Huang JF, Kuo SCH, Rau CS, et al (2019) The effect of lowering the legal blood alcohol concentration limit on driving under the influence (DUI) in southern Taiwan: a cross-sectional retrospective analysis. *BMJ Open.* Apr 20;9(4):e026481.
12. Haghpanahan H, Lewsey J, Mackay DF, McIntosh E, Pell J et al (2019) An evaluation of the effects of lowering blood alcohol concentration limits for drivers on the rates of road traffic accidents and alcohol consumption: a natural experiment. *Lancet.* Jan 26;393(10169):321-329.

13. Hamnett HJ, Poulsen H (2018) The Effect of Lowering the Legal Drink-Drive Limit on the Toxicological Findings in Driver Fatalities: A Comparison of Two Jurisdictions. *J Forensic Sci. Sep*;63(5):1457-1465.
14. Adult Drinking Habits in Great Britain.
15. Department of Transport. Reported road casualties in Great Britain: Estimates for accidents involving illegal alcohol levels in 2016(final) GOV.UK.
16. Hadland SE, Xuan Z, Sarda V, Blanchette J, Swahn MH, et al (2017) Alcohol Policies and Alcohol-Related Motor Vehicle Crash Fatalities Among Young People in the US. *Pediatrics. Mar*;139(3). pii: e20163037.
17. Voas RB, Tippetts AS, Fell JC. (2003) Assessing the effectiveness of minimum legal drinking age and zero tolerance laws in the United States. *Accid Anal Prev. Jul*;35(4):579-87.
18. Fell JC. (2019) Approaches for Reducing Alcohol-Impaired Driving: Evidence-Based Legislation, Law Enforcement Strategies, Sanctions, and Alcohol-Control Policies. *Forensic Sci Rev. Jul*; 31(2): 161-184.
19. Road Safety Authority, Ireland, Review of Lower Drink Driving Limits, 13th December 2012.
20. Silva JBS, Cristino ED, Almeida NL, Medeiros PCB, Santos NAD. (2017) Effects of acute alcohol ingestion on eye movements and cognition: A double-blind, placebo-controlled study. *PLoS ONE, Oct*; 12(10):e0186061.
21. Yadav AK, Velaga NR. (2019) Effect of alcohol use on accelerating and braking behaviors of drivers. *Traffic Inj Prev.*;20(4):353-358.
22. Irwin C, Iudakhina E, Desbrow B, McCartney D. (2017) Effects of acute alcohol consumption on measures of simulated driving: A systematic review and meta-analysis. *Accid Anal Prev. May*;102:248-266.
23. Li G, Chihuri S, Brady JE. (2017) Role of alcohol and marijuana use in the initiation of fatal two-vehicle crashes. *Ann Epidemiol. May*;27(5):342-347.e1.
24. Martin JL, Gadegbeku B, Wu D, Viallon V, Laumon B. (2017) Cannabis, alcohol and fatal road accidents. *PLoS One. Nov* 8;12(11):e0187320.
25. Woolsey CL, Jacobson BH, Williams Jr RD, Adam EB, Davidson RT, et al (2015) A Comparison of the Combined-Use of Alcohol and Energy Drinks to Alcohol-only on High-Risk Drinking and Driving Behaviours. *Substance Use & Misuse.*: 50(1); 1-7.
26. Reid SD, Gentius J.(2018) Intensity of Energy Drink Use Plus Alcohol Predict Risky Health Behaviours among University Students in the Caribbean. *Int J Environ Res Public Health.*; 15(11):2429.
27. Chihuri S, Li G.( 2017)| Use of prescription opioids and motor vehicle crashes: A meta analysis. *Accid Anal Prev. Dec*; 109: 123-131
28. Bonar EE, Cranford JA, Arterberry BJ, Walton MA, Bohnert KM, Ilgen MA (2019) Driving under the influence of cannabis among medical cannabis patients with chronic pain. *Drug Alcohol Depend. 1*;195:193-197.
29. Drug-Impaired Driving: Marijuana and Opioids Raise Critical Issues for States. Washington DC: Governors Highway Safety Association; 2018.
30. RAC report on Motoring 2018.



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