

Impaired driving and road safety

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Impaired driving is related to considerable increases in crash risk. This report describes measures against impaired driving, based on literature reviews. Measures that were found to be potentially effective in empirical studies are DUI-enforcement (checkpoints), vehicle impoundment and alcolock. However, the effects depend on the design and implementation of the measures. For example, alcolock and vehicle suspension may be effective for some drivers, but the effects depend on the specific implementation and tend not to last beyond the period during which the vehicle is impounded or alcolock installed. For other measures, there is no evidence of any direct effects on DUI, DUI-involved crashes or future DUI-offences among convicted drivers. However, BAC-limits, random breath testing laws and sanctions are essential requirements for effective police enforcement.

This report summarizes findings from literature reviews that have been conducted as a part of the revision of the Handbook of Road Safety Measures (last published version in English: Elvik et al., 2009).

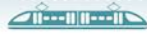
This report presents long versions of all chapters that describe measures against impaired driving, including all relevant references and descriptions of the statistical analyses. Short versions focusing on the main conclusions are published in Norwegian language on www.tshandbok.no.

The chapters in the Handbook of Road Safety Measures that are covered by this report are the following:

- 8.6 DUI legislation (chapter 3 in this report)
- 8.7 DUI enforcement (chapter 4 in this report)
- 8.8 DUI-specific sanctions (chapter 5 in this report)
- 8.9 Treatment and educational programs for DUI-convicted drivers (chapter 7 in this report)
- 8.10 Demerit point systems (chapter 8 in this report)
- 8.12 Fines and imprisonment (chapter 6 in this report).

Background

Alcohol impairs driving skills already at very low levels and the impairment increases strongly with increasing blood alcohol concentration (BAC). Drivers are generally poor in judging their actual level of impairment.



In Norway, only about 0.2% of the general driver population are impaired by alcohol, but alcohol is strongly overrepresented among crash involved drivers, especially among fatal crash involved drivers. The most common illicit drugs in Norway are stimulant drugs, followed by cannabis. The use of cannabis has increased over time, while the use of benzodiazepines has decreased.

Among impaired drivers, several other factors that are related to increased crash and injury risk, are strongly overrepresented, amongst other things: Young males, low socioeconomic status, convictions for other traffic violations, criminal history, and alcohol and addiction problems.

However, there are several differences between drunk drivers and drivers impaired by illegal or legal substances and between countries. For example, drunk driving is far less common among heavy vehicle drivers than among car drivers in Norway. In the USA, alcohol is more common among pedestrians and motorcycle riders than among car drivers.

Compared to sober drivers, alcohol impairment leads to substantial increases in crash risk, even when controlling for confounding variables such as those listed above. Relative crash risk increases about exponentially with increasing BAC, from 2.3 at BAC .05-.08 to about twenty times the risk of a sober driver at BAC above .12. The relative risk of being killed or seriously injured in a crash is about 3.6 at BAC .05-.08 and increases to more than 100 at BAC above .12.

Other substances were also found to increase crash risk. The increase is on average somewhat larger for illicit drugs, especially amphetamine, than for prescription drugs. Relative risk estimates are difficult to compare because the degree of impairment is mostly unknown for illicit and prescription drugs. Average relative risk estimates for amphetamine correspond to a BAC around .10. Average relative risk estimates for other illicit drugs correspond for the most part to a BAC between .01 and .08.

DUI legislation

This chapter describes road safety effects of legislation that aims to reduce DUI and related crashes.

BAC-limits contribute to crash reductions when combined with effective police enforcement, but are unlikely to be effective without enforcement.

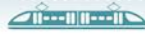
Among laws regulating the availability of alcohol, only minimum legal drinking age has been found to be related to alcohol-related crashes.

Inconsistent or no relationships with alcohol-related crashes were found for regional bans on alcohol sales, alcohol taxes and prices, outlet density, state monopoly, limited days or hours of sales, and open-container laws.

Other types of legislation for which no or inconsistent effects were found, are: Random breath testing laws (unless combined with police enforcement), implied consent, anti-plea bargaining, dram shop, social host liability, and child endangerment laws.

Although most studies fail to demonstrate the effectiveness of individual types of legislation in reducing DUI or DUI-related crashes, several types of legislation are still effective in combination with police enforcement and sanctions. Among such laws are BAC-limits, random breath testing laws, and administrative license revocation laws.

For the legalization of cannabis, highly inconsistent effects were found on cannabis-related crashes.



DUI enforcement

DUI enforcement may be conducted from checkpoints or by mobile controls (patrolling). Checkpoints were found to reduce alcohol-related crashes by 17% on average. However, this effect may be overestimated and it differs depending on the type of checkpoint program. Greater effects were found for short-term programs, programs that include paid publicity and checkpoints in Australia. Moreover, highly visible checkpoints with a high control frequency were found to increase the effectiveness.

For mobile enforcement, the results from empirical studies are highly inconsistent. On average, no crash reducing effect was found.

DUI enforcement in general, studies show that increased intensity of enforcement can be expected to improve its effectiveness. However, for individual drivers, having been arrested for DUI, has not been found to reduce the likelihood of future DUI-arrests or DUI-related crashes.

DUI-specific sanctions

DUI-specific sanctions may have different aims: To deter DUI-convicted drivers from new DUI-offences; to deter the general driver population from DUI; to remove DUI-convicted drivers from traffic or to prevent them from committing new DUI-offences.

Effects on accidents have been investigated for the following types of sanctions:

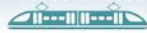
- (1) License suspension and revocation:** These were not found to have any deterrent effects, neither among the general driver population or among drivers who had their license suspended. Drivers with a suspended or revoked license have for the most part fewer accidents than other drivers (but still far more than if they had completely stopped driving).
- (2) Vehicle impoundment:** There may be a deterrent effect among drivers who have got their vehicle impounded, either for DUI or other offences (such as unlicensed driving). However, the results from empirical studies are inconsistent. Amongst other things, the measure may have little or no effect among drivers with very old cars.
- (3) Alcohol ignition interlock (alcolock):** Alcolock for DUI-convicted drivers mostly reduces DUI and DUI-related crashes as long as alcolock is installed in their cars. No effects were found on non-alcohol-related crashes and offences.

A common finding for all three types of sanctions is that both DUI-offences and DUI-related crashes return to the same level as before conviction once the restrictions have been lifted (license reinstated, vehicle returned, alcolock removed).

Treatment and educational programs for DUI-convicted drivers

Treatment and educational programs for DUI-convicted drivers (or other traffic offences) are meant to reduce either alcohol problems or driver behavior. Such programs can be either alternatives or supplements to classical sanctions (such as penalties or license suspension).

Treatment for alcohol problems has in empirical studies mostly not been found to reduce neither recidivism nor crashes. Some programs may still be effective, especially if they focus on drivers without addiction problems, criminal records, or cognitive impairments.



Educational measures are mainly targeted at drivers who have committed serious traffic offences but not alcohol- or dependency-problems. Empirical studies have found at best small and short-term effects. However, some recent studies of educational measures targeting specific types of driver behavior have found relatively large effects on recidivism and crash involvement.

Educational measures that are offered as an alternative to license suspension, were mostly found to increase reoffence rates and crash involvement among participating drivers (relative to license suspension).

For **Victim Impact Panels**, results from empirical studies are inconsistent and do not allow generalizable conclusions.

Demerit point systems

Demerit point systems are meant to reduce traffic offences that are related to crash involvement, but not in themselves sufficient for severe sanctions.

After the introduction of demerit point systems, relative large crash reductions were found in several countries, on average by about 15%. However, the effect decreases over time and long-term effects are unknown.

For those types of driver behavior that are included in demerit point systems, improvements were in several studies. However, in Norway, no effect was found in the general driver population.

Among individual drivers, a demerit point system may have a specific deterrent effect, i.e. drivers may commit fewer offences after having accumulated demerit points. On the other hand, accumulating demerit points is related to a generally risky driving style and thus, drivers with accumulated points may also be more likely to accumulate more points.

Fines and imprisonment

Fines and imprisonment are sanctions for the most serious traffic offences. In Norway, imprisonment is mainly used for DUI and the most severe speeding offences.

Empirical studies have for the most part not found any effects on total crash numbers of the introduction or increase of minimum fines or lengths of imprisonment. However, this does not mean that crash numbers would remain unchanged if fines and imprisonment were abandoned as sanctions for traffic offences.

Studies that have compared the effects of imprisonment and other sanctions among convicted drivers (mostly for DUI), did not find systematic differences. This means that imprisonment is not necessarily more effective in preventing future offences than other sanctions (such as fines, license suspension or DUI-treatment programs).