

Driving under the influence of alcohol

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Summary

In 2015, an estimated 12% - 23% of the road deaths in the Netherlands were due to drink driving. This then amounted to 75 to 140 fatalities. During the most recent measurements in 2019, 2.3% of the drivers were under the influence of alcohol during weekend nights, which is a considerable increase compared to the previous measurements in 2017. The percentage is much higher among cyclists: measurements in 2013 in the evening and at night/in the early morning (between 5 pm and 8 am) in the entertainment areas of the cities The Hague and Groningen showed that on average 42% of the tested cyclists had used more alcohol than legally allowed. About two-thirds of all severe alcohol related crashes are caused by the relatively small group of serious alcohol offenders, estimated to number between 90,000 and 125,000 offenders.

Drivers under the influence of alcohol engage in more impulsive and more adventurous driving behaviour. Furthermore, they assess traffic situations less well, perceive dangers less timely, are less capable of reacting in time, show worse vehicle control, and are less alert. Crash risk is about 1.4 times higher for a driver with a blood alcohol content (BAC) of 0.5‰ than for a sober driver. At a BAC of 1.0‰, the risk is nearly four times higher, and more than twenty times higher at 1.5‰. Also for cyclists, crash risk gets higher with increasing BAC. Deterioration in driving behaviour is more noticeable in younger drivers.

The BOB designated driver campaign has possibly contributed to a reduction in alcohol consumption by road users, but the effects of this campaign cannot be seen in isolation from intensified police enforcement of driving under the influence (DUI). The Educational Measure Alcohol (EMA) proves to have a positive effect on the risk of recidivism; for the Light Educational Measure Alcohol (LEMA) no effect could be proven. Severer penalties, or suspension or revocation of the driving licence seem to have hardly any effect on serious alcohol offenders. For this group, new more preventive measures need to be developed, taking a broader approach towards the problem underlying their alcohol offences, possibly in combination with an alcoholock or ankle tag.

1 How frequent is driving under the influence of alcohol in the Netherlands?

Cars

According to the latest measurements (in 2019) of drink driving by drivers in weekend nights, 2.3% were under the influence of alcohol [1]. They had a blood alcohol content (BAC) of 0.5‰ or higher¹; see *Figure 1*. The favourable development of alcohol use during weekend nights in 2002-2017 (from 4.1% in 2002 to 1.4% in 2017) reversed to a considerable increase in 2019: an increase of 1.4% offenders in 2017 to 2.3% in 2019. The proportion of serious offenders (BAC > 1.3‰) even increased from 0.1% in 2017 to 0.3% in 2019.

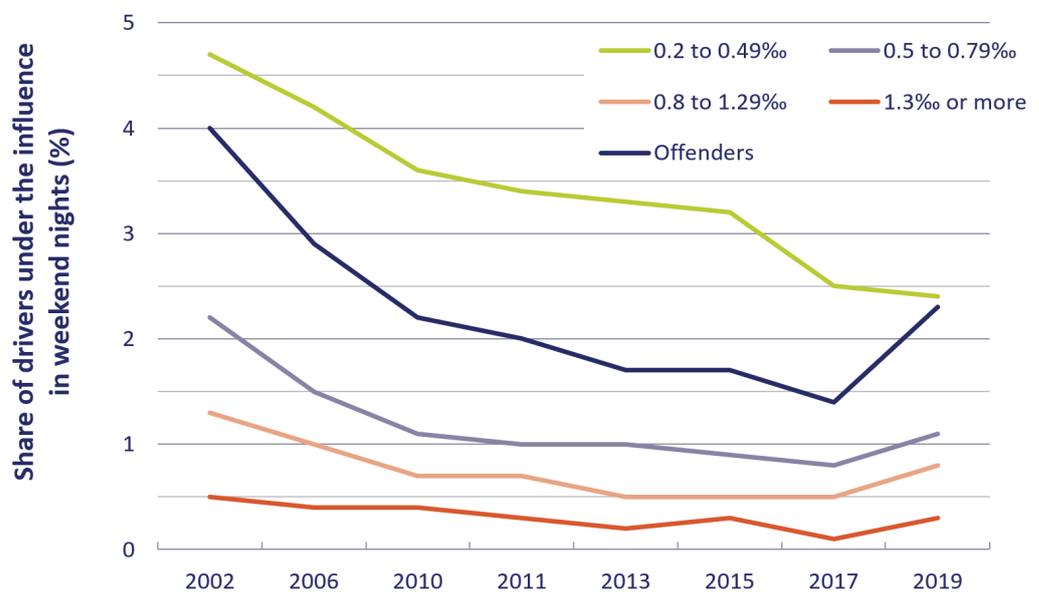


Figure 1. Development of drivers under the influence in weekend nights 2002-2019 (Source: I&O Research [1]).

The study does not explain this unexpected development. Enforcement of alcohol regulations has, however, strongly decreased in the last few years [2] [3]. In the Netherlands, the *subjective* chance of being caught – road users’ perception of the chance of an alcohol check – decreased. In 2015, 17% of Dutch drivers said to have been checked for drink driving, whereas in 2018 this percentage was reduced to 10% [4]. Conversely, in Belgium, the percentage of drivers that said to have been checked increased from 17% in 2015 to 24% in 2018 [4]. The Trimbos Instituut, the Netherlands Institute of Mental Health and Addiction, submits that the subjective chance of being caught has decreased due to a different set-up of alcohol checks: “The police have discontinued large-scale alcohol checks and have adopted a risk-based approach to alcohol checks. This appears to reduce the subjective chance of being caught for drink driving” ([5]; p. 47).

1. In this fact sheet, the legal alcohol limit is expressed in ‰ (the number of milligrams of alcohol per millilitre of blood); in the Netherlands, a different measure is also often used, the so-called µg/L, micrograms of alcohol per litre of breath.

Bicycles

Night measurements in 2013, the most recent data available, showed that on average 42% of the tested cyclists had consumed more than the legal amount of alcohol (a BAC higher than 0.5‰) [6]. These alcohol measurements were carried out among cyclists in the entertainment area of the cities The Hague and Groningen on Thursday and Saturday evenings and nights/early mornings (5.00 pm to 8.00 am). The percentage of cyclists under the influence increased as the evening/night progressed: at the beginning of the evening none of the cyclists had a BAC above the legal limit, after 1.00 am 68% of the cyclists had a BAC higher than 0.5‰ and after 5.00 am in the morning this was even the case for more than 80% of the tested cyclists.

The number of young cyclists (aged 15-29) who are hospitalised in weekend nights after a cycling crash not involving a motor vehicle, has been increasing for several decades; in 2014 alcohol played a role in half of these crashes [6].

2 What are the legal alcohol limits in the Netherlands?

For road users in the Netherlands, the legal BAC limit is 0.5‰; and 0.2‰ for novice drivers and novice (light) moped riders (see Table 1). For pedestrians there is no legal alcohol limit. However, the police can report a pedestrian for public intoxication. In such a case, the police will not take a breathalyser test or a blood test, but will assess the physical characteristics of drunkenness and the behaviour of the pedestrian. In contrast to most European countries, The Netherlands do not have a different limit for professional drivers (see Table 2). The effect of a different limit for professional drivers is unknown.

Table 1. Legal alcohol limits for different road user groups in the Netherlands.

| Mode of transport | Legal alcohol limits in the Netherlands |
|--|---|
| Driver | 0.5‰ |
| Cyclist | 0.5‰ |
| Truck driver | 0.5‰ |
| (Light) moped rider | 0.5‰ |
| Novice driver and novice (light) moped rider | 0.2‰ |

Table 2. Legal European alcohol limits in 2017 [7].

| Country | Legal alcohol limits in Europe | | |
|---|--------------------------------|----------------|-------------------------------|
| | General | Novice drivers | Professional drivers |
| Hungary, Slovakia, Romania, Czech Republic | 0.0‰ | 0.0‰ | 0.0‰ |
| Estonia, Poland, Sweden | 0.2‰ | 0.2‰ | 0.2‰ |
| Lithuania | 0.4‰ | 0.0‰ | 0.0‰ |
| Germany, Italy, Croatia, Slovenia | 0.5‰ | 0.0‰ | 0.0‰ |
| Austria, Switzerland | 0.5‰ | 0.1‰ | 0.1‰ |
| Cyprus, Greece, Ireland, Luxembourg, Portugal | 0.5‰ | 0.2‰ | 0.2‰ |
| France | 0.5‰ | 0.2‰ | 0.5‰ (bus drivers 0.2‰) |
| Latvia, the Netherlands | 0.5‰ | 0.2‰ | 0.5‰ |
| Spain | 0.5‰ | 0.3‰ | 0.3‰ |
| Belgium | 0.5‰ | 0.5‰ | 0.2‰ |
| Bulgaria, Denmark, Finland, Scotland | 0.5‰ | 0.5‰ | 0.5‰ |
| United Kingdom (excl. Scotland), Malta | 0.8‰ | 0.8‰ | 0.8‰ |

3 What is the effect of alcohol on driving behaviour?

When drink driving, the skills required for safe driving diminish [8] [9]. Drivers are more impulsive and reckless. Furthermore, they assess traffic situations less well, recognise dangers less timely, are less capable of reacting in time, show worse vehicle control and they are less alert. This deterioration in driving behaviour is more noticeable among young drivers.

Moskowitz & Fiorino [10] and Caird, Lees & Edwards [11] studied simulation research into the effects of a low dose of alcohol on reaction speed, vehicle control and driver alertness. They found the following effects:

Reaction speed:

the speed with which one perceives objects, processes the information and reacts, already starts to reduce at a blood alcohol content (BAC) of 0.3‰. It then takes longer to recognise a dangerous situation, to react to a red light, and to respond to a braking vehicle in front [11].

Vehicle control:

under normal conditions, steering skills begin to deteriorate from a BAC of 0.5‰ onwards, but in particular and/or difficult conditions (e.g. when crosswinds deflect the vehicle) problems are experienced from a BAC of 0.2‰ onwards [10].

Alertness:

drivers become less alert, from a BAC of 0.3‰ onwards [10]. When blinking, drivers keep their eyes closed for longer and the reaction to a simple stimulus is slower [11].

Dupont, Martensen & Silverans [12] summarise the effects of alcohol on driving skills as follows (p. 7): "Automated processes begin to deteriorate from a BAC of 0.5‰ onwards; the processes that require any conscious attention of the driver, are already affected from 0.2‰ onwards".

In a meta-analysis of driving simulator studies into the effect of alcohol use on driving behaviour, Irwin et al. [13] found that drinking alcohol (BAC levels ranging from 0.23 to 1.0‰) caused more swerving (variation in lane position) and more variation in speed.

4 How many casualties in the Netherlands are due to driving under the influence of alcohol?

In 2015, an estimated 12 to 23% of road deaths in the Netherlands were related to alcohol; this then amounted to 75 to 140 road deaths [14]. This estimate is based on the proportion of drivers with a blood alcohol content (BAC) above the limit on weekend nights in 2015 and on the basis of data of the risk per BAC category (see Houwing et al. [15] for the estimation methodology). The estimate does not distinguish between different modes of transport (e.g. cyclists and drivers). There are no reliable estimates about the number of road users that are seriously injured due to alcohol use in traffic.

The actual numbers of road deaths and road injuries in alcohol related crashes are not known either. The information in the police crash registration and in the hospital registration is incomplete, as alcohol tests are not always carried out. In addition, road deaths are very rarely tested for alcohol, as this is not considered useful from the perspective of criminal justice. A standard blood test after a road crash in which the probable culprit died is impossible to organise within the Dutch criminal justice framework, since it does not serve any criminal prosecution purpose [16].

5 What are the risks of driving under the influence of alcohol?

Cars and delivery vans

The risk of a crash increases with the amount of alcohol a driver has drunk. A large-scale American case control study shows that at a blood alcohol content (BAC) of 0.5‰, crash risk is approximately 1.4 times higher than when no alcohol has been consumed. At a BAC of 1.0‰, the risk is just over four times higher, and at a BAC of 1.5‰, the risk of a crash is more than twenty times higher as that for a sober driver (see *Figure 2*; [17]).

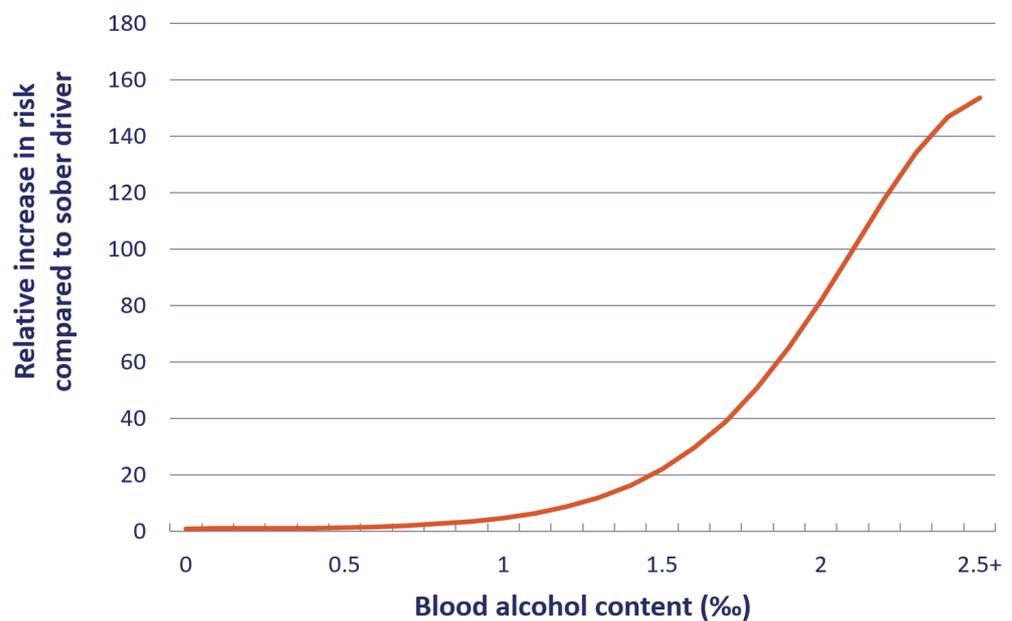


Figure 2. Relative increase in risk at increasing blood alcohol content (Blomberg et al., 2005; Table 33 [17]).

Other studies show that even at a BAC lower than 0.5‰, driving skills and crash risk are adversely affected. Compton & Berning [18] report a 1.2 risk increase for all drivers having a BAC of 0.3‰. Lower BAC levels mainly involve a risk increase for young (inexperienced) drivers. For example Peck et al. [19] report a risk increase of 1.4 for drivers under 21 at a BAC of 0.1 to 0.3‰.

Bicycles

The crash risk of cyclists increases after the use of alcohol. In Canada, Asbridge et al. [21] found that the risk (odds) of a bicycle crash was 4 times higher after alcohol consumption. The risk increase was established by different types of measurements of alcohol use: both the questionnaire measurements and the measurements via blood values gave the same risk increase. In Spain Martínez-Ruiz et al. [22] investigated the relationship between the use of alcohol or drugs and the risk of cyclists themselves causing a crash. This study found that after using alcohol or drugs, cyclists had a 4.5 times higher risk that they themselves would cause a crash with another vehicle and a twelve times higher risk of involvement in a single bicycle crash.

6 Which risk groups are distinguished in the Netherlands?

Young men

Although young drivers use less alcohol than older drivers [1], they are overrepresented in the casualty and driver groups involved in drink-driving crashes [24]. The reason is twofold: for young drivers, inexperience makes for a higher crash rate anyway, and alcohol affects driving behaviour more when drivers are young than when they are older [17] [25] [19]. Young men (aged 18-21) are overrepresented in serious road crashes involving alcohol. Although they only constituted 4% of the total number of driving licence holders, they made up 29% of the seriously injured drink drivers [26], according to the European study Driving Under the Influence of Drugs, Alcohol and Medicines DRUID). Young women were not overrepresented among seriously injured drink drivers.

Serious alcohol offenders

It is estimated that between 90,000 and 125,000 drivers in the Netherlands can be characterised as serious alcohol offenders: offenders who have been apprehended with a BAC higher than 1.3‰ at least once [27]. They are responsible for two-thirds of all severe alcohol crashes. If we relate this to the 75 to 140 road deaths in the Netherlands that were due to alcohol in 2015, approximately two-thirds, 50 to 95 road deaths, were caused by serious alcohol offenders. Traditional measures such as suspension or revocation of the driving licence and imposing fines seem to have hardly any effect on serious alcohol offenders [27]. For this group, new measures are needed, focusing on prevention with a broader approach to the problems underlying the alcohol offence, possibly in combination with an alcolock or ankle tag. See also the question [*Which other measures can be taken?*](#)

Goldenbeld, Blom & Houwing [27] characterise serious alcohol offenders as follows: they are more likely to be male, 30-40 years old, single and to be poorly educated. They have a high degree of alcohol dependence and additional psychiatric problems. Furthermore, their mindset tends to downplay the problem of driving under the influence and to avoid personal responsibility. An antisocial or anti-authoritarian attitude may also be part of this mindset. Serious alcohol offenders are also more frequently involved in criminal behaviour in fields other than traffic and they often use drugs in addition to alcohol.

7 Which criminal and administrative measures for driving under the influence are available and how effective are they?

Driving under the influence of alcohol is a traffic crime. Drivers who are apprehended for driving under the influence, are often sanctioned by one or more of the following measures: a fine, suspension of the driving licence, an educational measure, or an examination of fitness to drive.

In the Netherlands, a driver who is apprehended for drink driving often faces two procedures, each with its own measures: a criminal procedure in which a penalty is imposed by law (by the Public Prosecution Service (OM) or in court) and an administrative procedure in which the offender may face a 'notification order' (previously known as a requisition order) of CBR, the organisation responsible for driving licences in the Netherlands [27]. The main purpose of the criminal procedure is to punish the offender. The purpose of the notification order is to determine if a driver is still sufficiently capable or skilled to perform the driving task, and whether an additional measure is required to prevent him committing another alcohol offence. The notification order therefore focuses more on prevention and future behaviour.

Criminal procedure

In the *criminal procedure*, offenders with a blood alcohol content (BAC) up to and including 1.65‰ are punished by the Public Prosecution Service (OM). At a first offense the OM often issues a penalty order (fine), supplemented by suspension of the driving licence. The amount of the fine and the duration of the suspension increase as the BAC category gets higher. At a BAC of 1.66‰ or higher, in an injury crash, or in case of multiple recidivism, the alcohol offender is always brought to court. Irrespective of whether the OM or the judge impose a penalty, the alcohol offender's 'file' (formerly a criminal record) is entered into the Judicial Documentation System (JDS).

Administrative procedure

In the *administrative procedure*, the alcohol offender faces the measures that can be issued by CBR: an educational measure (Light Educational Measure Alcohol – LEMA, an Educational Measure Alcohol – EMA), or an examination of fitness to drive, and – until 2015 – an alcohollock. See also the questions [How effective are educational measures \(EMA and LEMA\) in the prevention of driving under the influence?](#); [How effective is an alcohollock in the prevention of driving under the influence? and What other measures can be taken?](#). The outcome of the examination of fitness to drive (or a more specific examination of alcohol use) may be that the driver does not meet the requirements for driving skills or fitness to drive. In that case, the driving licence will be revoked. The difference with a suspension of the driving licence is that after revocation of the licence the driver must once more prove his skills and/or fitness to drive at CBR. In this procedure, the height of the BAC, the number of years of holding a driving licence (novice driver or experienced driver), and characterisation as a multiple offender or not, are also issues that determine the type of sanction in the administrative procedure.

The CBR examination of a driver's alcohol use primarily intends to ascertain whether the offender's alcohol use can be diagnosed as problematic, and consists of a psychiatric and physical examination, and a blood test [28]. If the outcome is that the offenders are 'fit', an EMA is imposed; if the outcome is that the offenders are 'unfit', their driving licence is revoked, for the duration of at least having been demonstrably free of alcohol abuse or addiction for one year. Comparing participants of this examination to similar offenders who did not partake, shows that participation results in a statistically significant reduction of the chance of reoffending of almost 40% (from 11% to 7%). This effect has been shown for both the subgroup obliged to accept an EMA (examination declared them 'fit') and for the subgroup whose driving licence was revoked [28].

Table 3. Sanctions for experienced and novice drivers of motor vehicles in the Netherlands. The sanctions are for first offenders; higher penalties apply for multiple offenders (Sources: Staatscourant and Trimbos instituut [29]).

| Offence | Experienced drivers | Novice drivers |
|---|---|--|
| 0.22/0.54 - 0.80‰ | € 300 | € 300 Possibly: LEMA |
| 0.81 – 1.00‰ | € 425 Possibly: LEMA | € 425 + 2 months DD Possibly: EMA |
| *1.01 - 1.15‰ | € 550 Possibly: EMA | € 550 + 2 months DD Possibly: EMA |
| 1.16 - 1.30‰ | € 650 Possibly: EMA | € 650 + 4 months DD Possibly: EMA |
| 1.31 – 1.50‰ | € 650 + 4 months DD Possibly: EMA | € 650 + 6 months DD Possibly: examination fitness to drive |
| 1.51 – 1.65‰ | € 750 + 6 months DD Possibly: EMA | € 750 + 6 months DD Possibly: examination fitness to drive |
| 1.66 – 1.80‰ | € 850 + 7 months DD Possibly: EMA | € 850 + 7 months DD Possibly: examination fitness to drive |
| > 1.81‰ | Min € 950 + min 8 months DD Possibly: examination fitness to drive | Min € 950 + 8 months DD Possibly: examination fitness to drive |
| > 2.36‰ | Min 60 h. community service + min 12 months DD Possibly: examination fitness to drive | Min 60 h. community service + min 12 months DD Possibly: examination fitness to drive |
| Recidivism | In case of recidivism, fines are higher and DD is longer. According to the Recidivism Scheme Serious Offences of June 2011, the driving licence is revoked if the BAC in the second alcohol violation > 1.3‰. In this case, the driver must once more take and pass the theoretical and practical exam in order to get a driving licence. | |
| DD = Driving Disqualification (OBM in Dutch) EMA = Educational Measure Alcohol LEMA = Light Educational Measure Alcohol | | |

8 How effective is an alcolock in the prevention of driving under the influence?

An alcolock programme has proved to be effective: it leads to less recidivism than suspension or revocation of the driving licence. This effect is often only observed during the period in which the alcolock is present, but if the causes of alcohol abuse are also tackled, the measure may also have more lasting effects. A study by WODC Research and Documentation Centre shows that the recidivism rate in the Netherlands is lower than for other measures, even after removal of the alcolock [30]. An alcolock is an alcohol tester that is connected to the starting mechanism of the car. The tester works as an immobilizer. It is only possible to start the car after passing an alcohol test. An alcolock is usually part of an alcolock programme that does not only include installing an alcolock in the car, but also involves an accompanying educational or medical programme.

Various international studies in the period 1990-2020 show that the recidivism rate of users of an alcolock is 65-90% lower than that of drivers whose licences were suspended or revoked [31] [32] [33]. In the studies, no evidence was found for an effect of the alcolock after it had been removed from the vehicle [34] [35] [36] [37]. The alcolock programmes in Sweden [38] [39] and the US [40] showed that the programme did result in lasting changes, both in alcohol consumption and drink driving. According to the Swedish researchers, these lasting changes are the result of the integral character of the programme: it addresses the cause of the alcohol problem, and not just the symptoms. This outcome corresponds to the US findings: if an alcolock programme is coupled with psychological counselling to deal with an alcohol problem, reduced recidivism lasts from one to four years after removal of the alcolock [40]. For the Netherlands, WODC Research and Documentation Centre concluded that an alcolock programme is better able to prevent recidivism than other measures [30]. Participation in an alcolock programme results in a 50% reduction of drink-driving recidivism in the two years after removal of the alcolock.

In addition to a measurable effect of reduced recidivism, US studies also found proof of a direct road safety effect: in states with an alcolock measure the number of alcohol related road deaths is significantly lower than in states without such a measure [41] [42] [43] [44].

Ban on alcolock

In March 2015, the Dutch Council of State determined that CBR could no longer impose the alcolock programme. The main argument was that imposing the programme under administrative law, without the intervention of a judge, could have disproportionate effects in a substantial number of cases. In 2018, after consultation of several experts, the Minister of Justice and the Minister of Infrastructure and Water Management concluded that other measures were preferable to reintroduction of the alcolock programme (under criminal law) [45]. The ministerial arguments against the alcolock programme were that the target group eligible for the imposition of an alcolock would be small (30 – 2270 persons in the scenarios that were examined), that the costs of an alcolock are high and that the alcolock is susceptible to fraud. The ministers put forward the option to increase the penalty for drink driving and lowering the BAC for the examination of fitness to drive as alternative measures for the alcolock. See also the question [*How effective are heavier penalties?*](#)

9 How effective are educational measures (LEMA and EMA) in the prevention of driving under the influence?

A study by WODC Research and Documentation Centre on the effect of LEMA on recidivism (both general traffic offence recidivism and drink-driving recidivism were studied) found no measurable effect [46], but it did find a significant positive effect of EMA [30]. An evaluation proved EMA to be able to reduce recidivism by slightly over 20% (from 9% to 7%) compared to a criminal law sanction [30].

LEMA (Light Educational Measure Alcohol) and EMA (Educational Measure Alcohol) are educational measures that can be imposed by CBR (see also the question [*Which criminal and administrative measures for driving under the influence are available and how effective are they?*](#)). LEMA and EMA are courses about the risks of alcohol use in traffic, and on the necessity of separating alcohol consumption and traffic participation. The LEMA course takes two afternoons or two mornings, with a week in between. The two-day EMA course is spread over seven weeks. During the course, participants share their experiences and make assignments at the course location and at home. The course concludes with a one-hour personal meeting with the trainer.

10 How effective is the lower alcohol limit for novice drivers?

International research shows that lowering the alcohol limit for novice drivers results in less driving under the influence and in fewer crashes. Dutch data, however, do not show such positive effects. In the Netherlands, the reduced alcohol limit for novice (usually young) drivers was introduced in January 2006. The data on alcohol use in traffic by young people in the periods of four years before and four years after the introduction of the reduced limit (period 2002-2010), indicate that in this period the use of alcohol among young drivers did not decline more strongly than that among older drivers [47]. Nor was there a decline in the number of alcohol related road casualties among young people in the first two years after the introduction of the reduced limit [48].

International

Different reviews of mostly American and Australian studies conclude that lowering the alcohol limit for young drivers (mostly to 0 or to 0.2‰) results in less drink driving and fewer alcohol related crashes [49] [50] [51] [52].

Netherlands

In the Netherlands, the legal alcohol limit for novice drivers was lowered to 0.2‰ in January 2006. The lower limit was expected to reduce alcohol consumption by young drivers, but also to reduce combined use of alcohol and drugs. The latter mainly occurs among young men and goes hand in hand with a very high crash risk (see also the question [What are the risks of driving under the influence of alcohol?](#)). Data on alcohol use in weekend nights show that in 2002-2010 the alcohol use among young drivers did not decline more strongly than among older drivers. Whether the measures reduced combined alcohol and drug use by road users is unknown.

Weijermars & Van Schagen [48] also conclude that there is no evidence that the measure had a safety effect in the first years after its introduction. They find that the proportion of 18 to 24-year-olds among the number of fatal and severely injured alcohol related casualties did not decline in the two years after introduction of the reduced limit: in 2004/2005, on average 24.6% of the alcohol-related casualties were in the age group 18-24, in 2006/2007 the average was 24.8% and 28.4% in 2008. For novice drivers, the relatively slight chance of being apprehended possibly causes the lack of an effect.

11 How effective is the Bob campaign?

The Bob campaign (designated driver campaign) has possibly contributed to a reduction of alcohol use by both experienced and young drivers [53]. Yet, the effect of the campaign on crash rate has not been evaluated. Due to coinciding other activities (such as intensified police enforcement), the effect of the campaign is hard to determine.

In 1995, the Bob-campaign was designed by the Belgian Institute for Road Safety, currently the Vias Institute [54]. The campaign aims to get people to agree on the designated driver before drinking alcohol. Late 2001, the Bob campaign was introduced in the Netherlands. The campaign concept is renewed every so often, to safeguard the appeal of the Bob message to the target group. In 2015, the Bob concept was broadened to all drivers, including solo drivers. The Bob campaign possibly contributed to the strengthening of the social standard that one should agree on who is the Bob, the designated driver, if you go out and want to drink alcohol, and also to the reduction of alcohol use in traffic by both experienced and young drivers. The effect of Bob campaigns, however, goes hand in hand with intensified enforcement on driving under the influence, which is often aligned with the Bob campaign. In 2020, the Belgian Bob campaign was extended by giving drink drivers a key ring shaped as the name of a child killed due to drink driving. In 2021, the Ministry of Infrastructure and Water Management will assess whether this Belgian element will also be added to the Dutch Bob campaign [55].

In reviews of designated driver studies, no conclusions are drawn about the effectiveness of these programs in reducing drink driving or alcohol related crashes, since most of the studies do not present enough evidence [56]. A review of American and Canadian studies about the effectiveness of programmes for alternative transport for pub- and partygoers (including designated driver programmes) did not draw any firm conclusions either [57].

12 How effective are heavier penalties?

There is no evidence that heavier penalties for alcohol offenders have an effect on reducing offences. In the Netherlands, a considerable increase in the penalties for driving under the influence in 1992 (higher fines and more rapid suspension of the driving licence) did not lead to a decrease of drink driving [58] [59]. On the contrary, there was even a slight increase, probably partly due to the fact that the enforcement level simultaneously declined strongly. There is no international evidence of the effect of heavier penalties on drink driving either. An Australian study [60] found no relation between the penalty level and the chance that an alcohol offender would reappear in court. Nor was there any evidence that the length of the period that the suspension was revoked had an effect on this chance. Sloan et al. [61] found no relation between self-reported drink driving and perceived risks of being fined, of licence suspension, or of an ankle tag that monitors alcohol use (SCRAMM). In Chile, no proof was found that heavier penalties for drink driving resulted in fewer alcohol related road deaths [62].

Imprisonment is one of the heaviest penalties for drink driving. In different American States, the introduction of laws that prescribe imprisonment for offenders who are caught drink driving for the first time, were found to have little or no effect on drink driving [63]. Australian research [63] found no relation between imprisonment and recidivism [64]. Howard et al. [65] concluded that research clearly shows that for a deterrent to be effective, penalties should be applied swiftly, confidently and consistently, while the severity of the penalties has a smaller effect [65].

There may definitely be good reasons to impose heavier penalties for drink drivers, but ever increasing penalties should not be expected to be effective in reducing alcohol related road casualties or recidivism. Most certainly not if the *subjective* chance of being caught – the probability of an alcohol check as estimated by road users – remains low.

13 How effective is suspension or revocation of the driving licence?

Suspension or revocation of the driving licence reduces the number of offences and crash involvement and thus contributes to increased road safety [66]. Yet, these penalties are not the most effective ones from a road safety perspective, and they are often more effective in combination with other measures (rehabilitation for example) than as a standalone measure [66].

When a driver's licence is suspended, the driver is not allowed to drive a car for a certain amount of time. When the driving licence is revoked, driving skill and/or fitness to drive will have to be proved to CBR once more (see also the question [*Which criminal and administrative measures for driving under the influence are available and how effective are they?*](#)).

Suspension or revocation of the driving licence is no guarantee that these drivers do in fact no longer drive a car. Based on telephone interviews with 1000 drivers in Austria, for example, it was

estimated that more than a quarter of the drivers whose driving licence had been suspended continued to drive, and about 15% even continued to drive under the influence of alcohol [67]. American and Australian studies (described in [68]) indicate that 50-70% of the alcohol offenders continued to drive (occasionally) even after suspension or revocation of the licence. Goldenbeld, Houwing & Blom [27] conclude that traditional measures, such as fines and licence suspension, seem to have little or no effect on the group of serious alcohol offenders. At least 45% of serious alcohol offenders are persistent in their violation behaviour and continue to drink drive even after such penalties were imposed.

14 How effective are alcohol checks?

Regular alcohol checks are effective in reducing the number of alcohol related crashes. A meta-analysis on results from forty studies indicates that crashes decrease by 17% when regular alcohol checks are carried out [69]. The effects are considerably larger in Australia (22% reduction) than in the United States (12% reduction). The greater effectiveness in Australia is probably due to the fact that they use random breath testing on large numbers of drivers (around 1 in 3). In random testing every stopped driver is tested for alcohol use, irrespective of gender, age, or skin colour. In the United States, considerably fewer drivers are tested for alcohol and testing is not random. According to the law, a police officer can only carry out a breath test if a driver is suspected to be under the influence. Partly based on Dutch data, Mathijssen [58] estimated that each doubling of the number of alcohol checks results in 25% fewer alcohol offenders.

15 What other measures can be taken?

Reintroduction planned alcohol checks

Regular alcohol checks are effective in reducing the number of alcohol related crashes (see also the question [How effective are alcohol checks?](#)), but in traffic, enforcement of drink driving laws has strongly declined in the last few years. In 2016, the number of wide-scale alcohol tests at DUI checkpoints was almost half that of 2013 [3]. In 2017, fewer than 19,000 drink drivers came into contact with the criminal justice system, a 32% reduction of the 2012 number that amounted to slightly over 27,000 ([2] based on Public Prosecution Department figures). A reason for this decrease is the lack of effectiveness of the wide-scale alcohol checks or DUI checkpoints due to drivers' increasing ability to avoid them by up-to-the-minute information on social media/apps [70]. Although it is indeed harder to 'catch' offenders in this way, DUI checkpoints *can* affect the *subjective* chance of apprehension; road users' estimation of the chance of being checked. If road user groups use social media to inform one another, the one target group that is especially receptive to information about alcohol checks is the drink driver group. To achieve maximum effectiveness, large-scale alcohol tests at DUI checkpoints can be alternated with flexible alcohol checks that are of shorter duration and more often change locations.

Introduction of a 0-limit/further lowering of the limit

The European Transport Council advises a zero tolerance policy for alcohol use in traffic, which in practice entails a 0.2 ‰ alcohol limit in Europe [71]. At a BAC lower than 0.5‰, driving skills are already adversely affected (see the question [What is the effect of alcohol on driving behaviour?](#)) and crash risk increases (see the question [What are the risks of driving under the influence of alcohol?](#)). In several countries – Brazil [72] [73], Chile [74] [75], Japan [76], Uruguay [77], Taiwan [78] and Sweden [79] – proof was found that lowering the alcohol limit from 0.5 or 0.6‰ to a lower limit (0.2 or 0.3‰) positively affects road safety. The lower limits were always coupled with a significant reduction of alcohol related road crashes or road casualties. A majority of Dutch road users (65%) support a 0-limit for alcohol use in traffic; throughout Europe, 67% of road users are in favour of this measure [80].

The effectiveness of lower limits does, however, depend on the level of traffic law enforcement. Most road users will only adjust their behaviour if they think that there is a fair chance of being checked. The rather low chance of apprehension probably explains why previous lower limits for novice drivers were not effective in the Netherlands (see also the question [How effective is the lower alcohol limit for novice drivers?](#))

Public service advertising & education about alcohol use in traffic

Public service advertising, such as the Bob campaign, possibly contributes to reducing drink driving (among young people), but the effect cannot be seen in isolation from the intensified police enforcement that is often combined with such campaigns (see also the question [How effective is the Bob campaign?](#)). There is no research that shows that, by itself, public service advertising or an education programme, without further measures such as police enforcement, will reduce drink driving. See also SWOV fact sheets [Traffic education](#) and [Public service advertising and the 'alcohol interventions' overview](#).

Yet, there is evidence, mostly based on US studies, that long-term education programmes at schools and universities about the general (multiple) risks of alcohol (and other substances) can reduce alcohol consumption among young people [81] [82] [83]. These universal prevention programmes have a broader scope than just the prevention of driving under the influence. In the Netherlands, researchers of the Trimbos Institute advocate a more setting related form of public service advertising about alcohol and drug use in traffic, which should be a better fit for the current hotspot approach (targeting events, hotels/restaurants/cafes, certain areas, Friday evening work socials) to enforcement concerning alcohol and drug use [5]. Campaigns about values and standards are also advocated to make friends hold each other to account for driving under the influence of alcohol and/or drugs [5]. This calls for a careful evaluation of such campaigns on the basis of behavioural measurements, because there is no evidence that driving under the influence can be reduced by a campaign alone.

Prevention of alcohol offences and ankle tags

For a more prevention-oriented approach towards alcohol offenders in traffic, Goldenbeld, Houwing & Blom [27] distinguish three directions in which policy and measures can be further developed in the Netherlands:

1. *Better profiling* of alcohol offenders can be helpful in developing better prevention measures or providing a better referral to criminal and administrative measures (or forms of assistance).
2. *New preventive measures* should be developed targeting serious (alcohol) offenders who, as we already know, are not helped effectively by current policy.
3. Prevention should have a *broader approach* than addressing serious or repeat offenders in traffic. Not just actual alcohol offenders, but also potential or future offenders, need to be addressed by the policy and stimulated to change their behaviour.

An example of a preventive measure is regular or continuous monitoring of alcohol consumption by alcohol offenders. In the US, alcohol offenders whose alcohol consumption is measured through an ankle tag, were found to hardly reoffend when wearing the tag. Offenders who *did* reoffend were found to do so at a later time than the offenders in a control group [84]. Dutch ankle tag pilots proved to diminish alcohol consumption and delinquent behaviour, while tagged wearers were mostly positive about this means to monitor behaviour [85]. That is why the Dutch government also want to introduce ankle tags in the Netherlands [85]. How the ankle tag will affect driving under the influence is still unknown, and will mostly depend on how frequently judges will impose the measure.

The Trimbos Institute has identified several opportunities to improve the preventive approach to drink driving by better collaboration between the domains of public health and road safety [5]. Examples of better collaboration are:

- › Elaborate the theme of *driving under the influence* and add it to the treatment protocols for clients and their loved ones;
- › Link up with prevention programmes of the Dutch Addiction Association and the Dutch Addiction Probation Service;
- › Develop a strategy for calling to account road users who intend to get into their cars while under the influence of substances. To this effect, a protocol could be developed for groups of friends and professionals working at hospitality venues, at festivals and in sports canteens

Furthermore, employers and event organisers could take responsibility by preventing excessive alcohol consumption. The negative social implications of frequent and excessive alcohol consumption go beyond the scope of road safety [86]. An effective national moderation policy contributes to fewer alcohol problems and a reduction of drink driving. Particularly measures targeting the alcohol cost price and marketing are effective in reducing national alcohol consumption [86]. Campaigns only have a supportive effect: information campaigns and education do increase problem awareness, but this is insufficient to realise permanent behavioural changes [86].

Publications and sources

Below you will find the list of references that are used in this fact sheet; all sources can be consulted or retrieved. Via [Publications](#) you can find more literature on the subject of road safety.

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Colophon

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Topics:

Risks; Human behaviour in traffic

Figures:

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Reduce injuries
Save lives

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