

Lower level of drink-driving in The Netherlands coincides with increased drug-driving

Mathijssen, M.P.M.

SWOV Institute for Road Safety Research, The Netherlands

P.O. Box 1090, Leidschendam, 2260 BB, The Netherlands

Motorist; gender; age; alcohol; drugs; blood; urine; sweat; legislation; enforcement; detection; Netherlands.

Abstract

Since 1970, SWOV has carried out periodic roadside surveys into the alcohol consumption of a random sample of Dutch motorists during Autumn week-end nights. In 1997 and 1998, a random sub-sample of drivers was also urine-tested for a number of licit and illicit drugs.

Drink-driving in The Netherlands has dropped significantly since the mid-eighties. In 1983, 12% of car drivers during weekend-nights were over the legal BAC-limit of 0.5 g/l. In the first half of the 1990s, this proportion had dropped to around 4%. In the second half of the 1990s, the proportion of illegal BACs increased slightly, stabilizing around 4.5%. But, while drink-driving decreased substantially, the problem of drug-driving seemed to be growing, especially among young males. In the 1997/1998 sample, 6.4% of all urine tests turned out to be positive for one or more impairing drugs; 1% for medicaments like codeine and benzodiazepines, and 5.4% for illegal drugs. Of the illegal drugs, three quarters consisted of cannabis. The remaining quarter consisted of hard drugs, mostly cocaine in combination with cannabis. Among the drivers who tested positive for drugs, 12% had an illegal BAC. So, drug-driving correlates positively with drink-driving.

Introduction

November 1st, 1974, a legal BAC limit of 0.5 g/l was introduced in The Netherlands. From the mid-1980s on, a combination of technical developments and legislative measures enabled the police to switch gradually from selective breath testing to large-scale random breath testing. June 1st, 1996, administrative measures against drink-driving have become effective in The Netherlands, facilitating compulsory drink-driving education, medical examination, and license suspension (1).

From 1970 on, SWOV, in close co-operation with police forces all over the country, has carried out periodic roadside surveys into the alcohol consumption of motorists during Autumn week-end nights, with the intention of obtaining an insight into the patterns of drink-driving. The sample size has grown from about 3,000 tested motorists in the 1970s to nearly 25,000 in recent years.

In 1997 and 1998, a random sub-sample of 893 motorists was also urine-tested, by means of EMIT-II®, for a number of licit and illicit drugs, i.e.: (meth)amphetamines, cannabis, cocaine, opiates, methadone, benzodiazepines, barbiturates, and tricyclic antidepressants. SWOV conducted this research at the request of the Ministry of Transport, Public Works and Water Management.

Methods

In each of the twelve Dutch provinces a varying number of three to eight research areas is selected, dependent on population size. The sample of research areas is geographically spread over the province and stratified by degree of urbanisation. In each research area, a police control team, instructed and accompanied by a researcher, is visiting six different research locations, which are situated along traffic arteries inside built-up area. Research locations are geographically spread over a research area. The frequent change of location is intended to minimize the predictability of the police controls with respect to time and place.

Motorists are taken at random from moving traffic and breath-tested by means of a Dräger Alcotest 7410Plus screening device. Since random breath testing by the police is legally admitted in The Netherlands, non-response is virtually non-existent. Arrested motorists are breath- or blood-tested for evidential purposes at the police station. Police controls are equally distributed over Friday and Saturday nights, and are executed between 10 p.m. and 4 a.m.

Each test result, as well as sex and age of the motorist, is entered on a registration form with pre-printed date, time and location. In case of arrest, time of the roadside test, trip origin and evidential test result are also recorded. On each form, data of 30 motorists can be recorded.

In the end, provincial samples are put together, forming one nationwide sample. Since the number of observations per province differ less from each other than the number of inhabitants (as an indicator of traffic volume), the resulting BAC-distributions are weighted for differences in provincial population size. Data analysis is performed with the statistical program Weighted Poisson Model (2, 3).

In addition to the roadside survey, accident data is analyzed, and police co-ordinators of the control teams are interviewed on developments in police enforcement.

Development of drink-driving

After the introduction of the legal BAC-limit in 1974, the share of motorists with a BAC over 0.5 g/l dropped from 15%, in the beginning of the 1970s, to 12%, in the first half of the 1980s. From 1985 on, this share started to decrease rapidly, probably due to expanding possibilities for random breath testing (RBT) by the police. RBT was facilitated by the introduction of electronic screening devices and the subsequent introduction of evidential breath testing. The share of motorists with an illegal BAC dropped to 3.9% in 1991, raising high expectations for a further decrease in the years to come. This was prevented, however, by a reorganization of Dutch police forces, which came into effect in 1992. As a result of this reorganization, nearly all former traffic police departments were dismantled, changing traffic law enforcement from a separate specialism into an integral part of so-called basic police duties. This led to a drop in RBT. Subsequently, the share of drivers with an illegal BAC initially increased to 4.9% in 1994, more or less stabilizing at about 4.5% in the second half of the 1990s (see Figure 1).

In 1999, a start was made with the introduction of special traffic police squads in 7 out of 25 Dutch police regions. Within three years such squads should have been realized in all police regions.

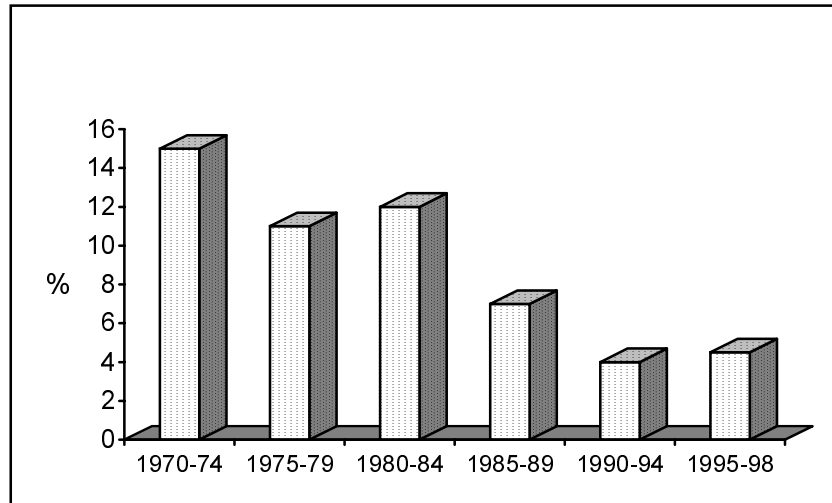


Figure 1: Development of the share of motorists with BACs > 0.5 g/l, in The Netherlands, in week-end nights, 1970-1998.

The highest share of illegal BACs was found in male motorists aged 25-49: an average of 6.1% over the period 1995-1998. The relatively highest share of alcohol-related fatalities and serious injuries, however, had males aged 18-24, namely 23% over the period 1995-1998, while forming only 5% of the Dutch population. One explanation for the marked over-representation of young males in alcohol-related traffic victims is that, even when sober, they have a higher accident risk than older males. The other explanation is that, when alcohol-intoxicated, their accident risk increases more than average (4), as is shown in Figure 2. Relative risks have been calculated by relating BAC-distributions in moving traffic to BAC-distributions in drivers who were involved in accidents (in week-end nights of 1996 and 1997).

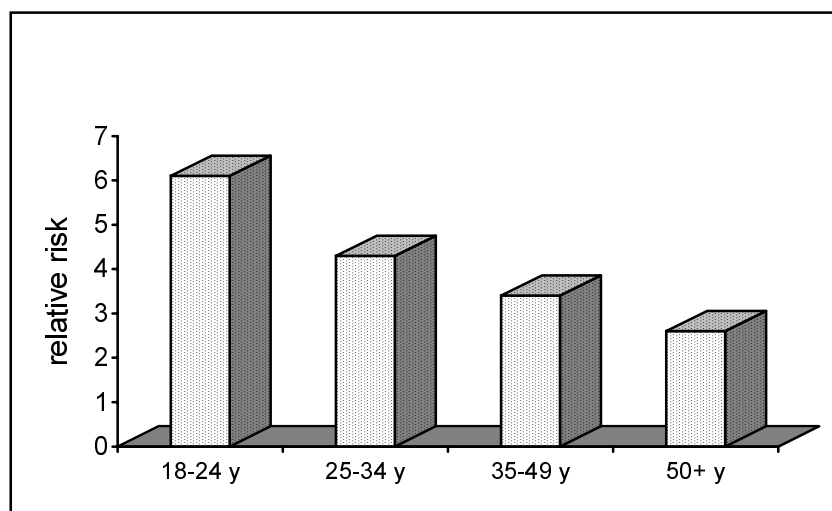


Figure 2: Relative risk of driving with an illegal BAC for male motorists of different age classes, in The Netherlands, in week-end nights, 1996-1997 (relative risk at legal BAC = 1).

In perspective of their relative risk, the development of drink-driving by young male motorists is rather disturbing. In the period 1991-1993, an average of 3.1% exceeded the legal BAC-limit; in the period 1994-1996, 3.5%; and in 1997-1998, 4.0%. In order to stop this unfavourable development, the Dutch government in 1999 has decided to lower the legal BAC-limit for novice drivers to 0.2 g/l. The new limit is intended to become effective in 2001. Positive experiences in Austria (5) and Australia (6) have played a role in the government's decision.

Drink-driving by young female motorists is at a much lower level, and even tends to decrease (see Figure 3).

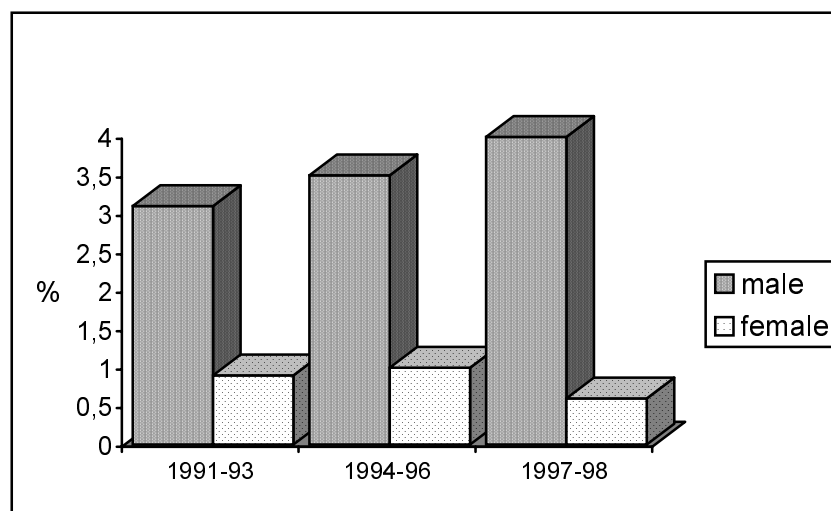


Figure 3: Development of the share of young motorists with BACs > 0.5 g/l, by sex, in The Netherlands, in week-end nights, 1991-1998.

Drug-driving in Autumn week-end nights

In the Autumn of 1997 and 1998, SWOV carried out a roadside survey investigating the drug and alcohol use of motorists in the Netherlands. This survey was conducted in a stratified sample of 26 research areas, on Friday and Saturday nights between 10 p.m. and 4 a.m. (7). The main objective of the study was to assess the incidence of drugs and alcohol in week-end nighttime motorists. The study had to provide a basis for monitoring future developments by means of follow-up studies. Motorists were stopped at random along the road, and were asked to co-operate with the drug trial on a voluntary basis. Co-operating motorists were interviewed about type and time of drug use, and they were asked to produce a urine sample for two-stage analysis in a laboratory. The first stage comprised screening by means of EMIT II7 for (meth-)amphetamines, cannabis, cocaine, opiates, methadone, benzodiazepines, barbiturates, and tricyclic antidepressants. The second stage comprised confirmation of positive screening results by means of GC-MS, or, in the case of cannabis, by means of HPLC-DAD. Furthermore, all subjects were breath-tested for alcohol by the police.

A total of 1,249 motorists were asked to participate in the study. Of them, 128 (10.2%) refused. From 228 subjects (18.3%) it was not possible to obtain a urine sample although these subjects were interviewed and underwent a sweat test for drugs. The results of urine analysis are shown in Table 1.

Sex	Illegal Drugs	Prescription drugs	Negative	Total No. of samples (column %)
Male drivers	46 (7.1%)	3 (0.5%)	596 (92.4%)	645 (72.2%)
Female drivers	2 (0.8%)	6 (2.4%)	240 (96.8%)	248 (27.8%)
All drivers	48 (5.4%)	9 (1.0%)	836 (93.6%)	893 (100%)

Table 1: Results of urine analysis for week-end nighttime motorists in The Netherlands.

Out of the 57 motorists who tested positive for drugs, 12 (21.1%) had a positive BAC (> 0.2 g/l) and 7 (12.3%) had an illegal BAC. Out of the 836 motorists who tested negative for drugs, 79 (9.4%) had a positive BAC and 37 (4.4%) had an illegal BAC. So drug-driving correlated positively with drink-driving ($Z = 2.91$; $\chi^2 = 9.57$, $df = 2$).

Especially among male drivers aged 18-24, the incidence of illegal drugs was found to be high (see Table 2); 24 out of 157 (= 15.3%) tested positive for these drugs; 18 were positive for cannabis only, one of them having a BAC between 0.5 and 0.8 g/l. Three were positive for a combination of cocaine and cannabis, one of them having a BAC over 1.3 g/l. Another one was positive for a combination of amphetamines and cannabis, also having a BAC over 1.3 g/l. Of the remaining two, one was positive for amphetamines, the other one for cocaine.

All 88 young female motorists, on the other hand, tested negative for licit and illicit drugs.

Age	Illegal drugs	Prescription drugs	Negative	Total No. of samples (column %)
18-24 y	24 (15.3%)	1 (0.6%)	132 (84.1%)	157 (24.3%)
25-34 y	13 (6.5%)	0 (0.0%)	187 (93.5%)	200 (31.0%)
35-49 y	9 (5.3%)	2 (1.2%)	159 (93.5%)	170 (26.4%)
50+ y	0 (0.0%)	0 (0.0%)	118 (100%)	118 (18.3%)
All male drivers	46 (7.1%)	3 (0.5%)	596 (93.6%)	645 (100%)

Table 2: Results of urine analysis for male motorists, by age.

When compared to the results of a pilot trauma study conducted by SWOV (8) in several Rotterdam hospitals, from April 1983 through January 1985, especially drug-driving by young males seems to have increased significantly since then.

Discussion

Although, at the turn of the millennium, drink-driving in general has stabilized at a relatively low level in The Netherlands, there still seems to be at least one major problem group, i.e. young male motorists. Not only their alcohol use is gradually increasing, but their use of illegal drugs seems to do so, too. The most worrying fact, perhaps, is that they tend to combine drug and alcohol use. Fatality studies in Australia and the USA indicate, that this combination generates the highest accident risk; approximately four times higher than the risk of drugs-only, and one and a half time higher than the risk of alcohol-only (9). The intended introduction of special traffic police squads in all Dutch police regions, together with the intended lowering of the legal BAC-limit for novice drivers, may have a favourable effect on drink- and drug-driving by young motorists in particular. That is, if random breath testing will be expanded by the introduction of those squads. On this

subject, however, there is room for some doubt, since the enforcement goals for drink-driving were formulated in terms of arrest numbers, not in terms of random testing numbers.

The favourable effects of large-scale RBT have been demonstrated clearly in Amsterdam. After the introduction in 1994, the share of motorists with an illegal BAC steadily dropped from 7.8% to 4.7%, in 1998. But from then on, unfortunately, drink-driving was no longer considered to be a major road safety problem in Amsterdam. Consequently, the enforcement level was about halved in 1999, leading to a significant increase of drink-driving. According to the results of the SWOV roadside survey in Autumn weekend-nights of 1999, the share of motorists with an illegal BAC had raised to 7.0%.

References

1. Mathijssen, M.P.M. Dutch drink-driving decreases after new policy. In: Mercier-Guyon, C. (ed.). *Alcohol, Drugs and Traffic Safety – T97*. Proceedings of the 14th International Conference on Alcohol, Drugs and Traffic Safety, Annecy, 21-26 Sept. 1997, Vol. 3, pp 1251-1258. CERMT, Annecy, 1997.
2. Leeuw, J. de & Oppe, S. Analyse van kruistabellen: loglineaire poisson modellen voor gewogen aantallen. R-97-41. SWOV, Voorburg, 1976.
3. Vogelesang, A.W. The analysis of weighted poisson data. D-96-12. SWOV, Leidschendam, 1996.
4. Mathijssen, M.P.M. Rijden onder invloed in Nederland, 1996-1997 (Driving under the influence in The Netherlands, 1996-1997). R-98-37. SWOV, Leidschendam, 1998 (In Dutch with English Summary).
5. Bartl, G., Esberger, R. & Brandstätter, C. Unfallbilanz nach fünf Jahren Führerschein auf Probe. *Zeitschr. f. Verkehrsrecht* 1997, 9: 317-321.
6. Brooks, C. & Zaal, D. Effects of a reduced alcohol limit for driving. In: Utzelmann, H.-D., Berghaus, G. & Kroj, G. (eds.). *Alcohol, Drugs and Traffic Safety – T92*; Proceedings of the 12th International Conference on Alcohol, Drugs and Traffic Safety, Cologne, 28 Sept.-2 Oct. 1992, Vol. 3, pp 1277-1288. Verlag TÜV Rheinland GmbH, Köln, 1992.
7. Mathijssen, M.P.M. Drug-, medicijn- en alcoholgebruik van automobilisten in Nederland, 1997/1998 (Drug and alcohol use by motorists in The Netherlands, 1997/1998). R-99-5. SWOV, Leidschendam, 1999 (In Dutch with English Summary).
8. Vis, A. Use of alcohol and drugs among road accident victims. In: Noordzij, P.C. & Roszbach, R. (eds.). *Alcohol, Drugs and Traffic Safety – T86*; Proceedings of the 10th International Conference on Alcohol, Drugs and Traffic Safety, Amsterdam, 9-12 Sept. 1986, pp 289-292. Elsevier Science Publishers, Amsterdam, 1986.
9. Parliament of Victoria. Final Report of the Road Safety Committee into the Effects of Drugs (Other than Alcohol) on Road Safety in Victoria, Volume 1. Victorian Government Printer, 1996.