

# Trends

## Investigation of alcohol levels in road accidents with personal injury, and alcoholisation indicators

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*Update on  
the most recent  
research*

*The report, Investigation of alcohol levels in road accidents with personal injury and alcoholisation indicators (2000 edition), presents a study carried out by INRETS with the support of OFDT. This study falls within the cross-departmental quantitative approach to alcoholisation undertaken for several years in France by the IDA (alcoholisation indicators) Group.*

When a road traffic accident involves personal injury, the police are required to examine the scene for evidence and make a report to be used in any subsequent legal action. In parallel with this procedure, which frequently takes more than a month, a faster one supplies electronic data to the ministries. This is the Analysis form of road traffic accidents with personal injury (BAAC), completed within six days from the accident. There are thus two main sources of information on accidents at the national level: the body of police reports and the BAAC files.

Surveys of reports on accidents with personal injury have been built up over a number of years. They have been started by ONSER (the national road safety organisation) and continued by its successor, INRETS, building a detailed body of data available on accidents that have occurred in France (INRETS, Tools and methods, No. 9). In the mid-nineties, the Department of evaluation and accident research (DERA) of INRETS undertook, on behalf of the national centre for monitoring road safety (ONISR), an analysis of alcohol levels of the drivers involved in accidents leading to injury, making use of 1 in 50 of police accident reports. This work allowed for the calculation of the proportions of accidents with injury and fatal accidents in the period 1988 to 1996 that involved alcohol in the sense that alcohol levels above the legal limit was detected for at least one of the drivers involved (INRETS synthesis No. 35; Fontaine and Gourlet, 1998).

In parallel, these results were published (*L'alcool à chiffres ouverts*, 1997) and discussed within the framework of the IDA group that was set up on the initiative of Claude Got and Jacques Weill to work on a quantitative approach to the effects of alcohol consumption. One of the objectives of the group is a concerted effort to maintain up-to-date information on the consumption of alcohol and its effects.

For some years, the ONISR offered no systematic use in its annual reports of the data regarding alcohol in the BAAC files. These reports tended to concentrate on the judicial aspects rather than on accident analysis. The latest reports, however (ONISR reports 2001 and 2002), provide an analysis of accidents involving alcohol on the basis of the BAAC files, which, to some extent, updates data that has been missing since 1996.

The starting point of the present study, launched by the end of 2001 by INRETS with the assistance of the OFDT, is also the production of up-to-date data on the implication of alcohol in road accidents. It also aims to analyse the operation of the system for gathering information on alcohol levels of road users involved in accidents in order to improve it. It thus has two purposes:

- ⇒ to take a detailed look at the state of affairs regarding both practices in obtaining alcohol levels data from those involved in accidents and the results of these tests with emphasis on "IDA" criteria sex, age and department,
- ⇒ to develop new mutual uses of the information available in the BAAC files and the police accident reports to contribute to potential improvement in the indicators of the implication of alcohol in road accidents.

The body of descriptive data produced now provides an analytical ground that can serve as a reference for 2000, a key year between one decade and the next one.

### A document in eight chapters

The first chapter of this INRETS report No. 252 describes the respective data systems based on the police accident reports and the BAAC files. It also presents the methodology applied to correlate the information extracted from these two sources. The second chapter defines the indicators devised to describe the implication of alcohol in road accidents: frequencies of alcohol levels whether illegal or indeterminate, absolute or as a proportion of known cases. The following chapters present the relatively exhaustive use of data from the BAAC files drawn up on the 227,062 drivers and pedestrians involved in accidents with injury during 2000. The variations in alcohol testing practices amongst the accident victim populations are described in chapter 3; this is an important aspect of the

question but it is often missing from studies. The frequencies of legal, illegal and indeterminate alcohol levels and the values of alcohol levels are examined in chapters 4 and 5 respectively. The results are categorised by sex of victim, age of victim, place, day and time. Chapter 6 examines the development of the implication of alcohol in accidents during the decade. The end of the chapter addresses the question of correcting for missing alcohol levels, proposes some hypotheses on which such correction might be based and applies them to the data. Chapter 7 deals with mapping the variations between the departments. The last chapter (chapter 8) compares the common information contained in the BAAC files and the police reports for a sample of 1,185 drivers and pedestrians figuring in both information sources. The intention of this report is to use the descriptive study of the system of collecting alcohol levels data from road users and its results to offer an informed use of the alcohol related data in the BAAC files, making use of the tool developed here to correlate BAAC and police report data. While analyses carried out confirm some already reached conclusions, such as the large proportion of young people under the influence of alcohol involved in accidents at night during the weekend, they also give a clearer view than hitherto. In particular, the underestimation of alcoholisation on the road and possible means of correcting this are demonstrated.

### Indeterminate alcohol levels remain numerous

The national files on traffic accidents in France, drawn up from the BAAC files, is a tool for monitoring and evaluating the effects of road safety policy and, in particular, the policies directed against drinking and driving. This information collection system is, in theory, exhaustive but, although the alcohol levels information gathering system has improved over the years, much data remains missing: for 15% of drivers or pedestrians involved in accidents with personal injury, the alcohol levels are unknown (a figure that reaches 26% for fatal accidents). These proportions are high, given the prevalence of illegal alcohol levels.

There are two causes: the cases where, for various reasons, the road user is not tested for alcohol (12.5% of cases) and the cases where, although the test was carried out, the result is not shown in the BAAC (2.3% of cases). The resulting 14.8% of cases in which alcohol levels remain unknown obviously have an effect on estimations of the implication of alcohol in accidents.

### The figures that quantify the implication of alcohol are many

The proportion of accident-involved drivers or pedestrians with personal injury who are “over the limit” is found to be 5.5%, a figure which seems, after all, fairly small. If, however, we concentrate only on fatal accidents, this proportion is found to be 16.8%, which rises to 25.4% if we confine ourselves to those considered responsible for fatal accidents. If we now consider the proportion of alcohol-related accidents (i.e. at least one of the drivers or pedestrians involved is “over the limit”), the figures are doubled: 11% of accidents with personal injury and 35% of fatal accidents involve an alcohol infringement. Specifying rather more closely the type of accident, it can be calculated that, on weekend nights, 34% of

accidents with personal injury and 65% of fatal accidents involve someone with an illegal alcohol level...

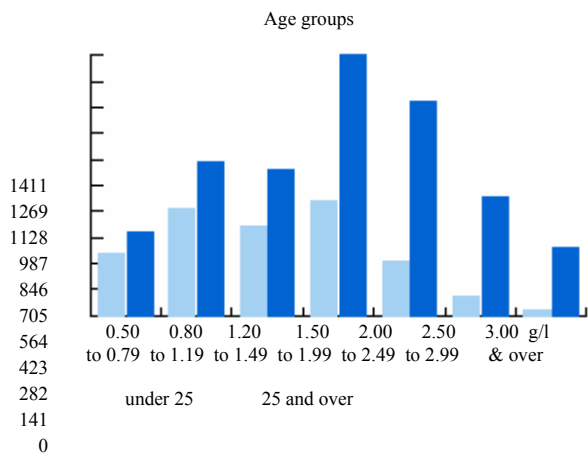
Thus, by specifying the accident population more and more precisely, extremely high proportions involving illegal alcohol levels can be made to appear. To avoid clouding the issue, it is useful to relate these proportions to the sizes of the populations for which they are calculated, i.e. to relate every proportion to the corresponding sum of accident victims or accidents.

### It is not only the young drivers who are found to be under the influence of alcohol when involved in an accident

With regard to preventive measures in the field of alcohol and road accidents, it is customary to focus particularly on young drivers, these being the high-risk group. However, analysing alcohol levels in various age groups shows proportions of accident victims “over the limit” that are almost the same for all age groups between 18 and 50 (6 to 7 %) with a fall-off only above 50 and, more noticeably, above 60. Furthermore, illegal alcohol levels, in absolute figures, are particularly prevalent amongst the over-25s and with higher alcohol levels than in the under-25s.

Putting it another way, being over the limit is, to a large extent, an offence committed by drivers other than the young

### Distribution of illegal alcohol levels (<25, >25 years of age)



and, in insisting on the “alcohol factor” amongst the young, we sometimes forget how widespread and sometimes ingrained it is amongst other age groups. There is body of data tending to show that, for drivers aged over 40, driving under the influence of illegal amounts of alcohol and, all the more, involvement in an accident under the influence of alcohol should be considered as a sign of a drinking problem and possible alcohol dependency (Facy et al, 2002).

### These accidents follow the patterns of social alcohol consumption

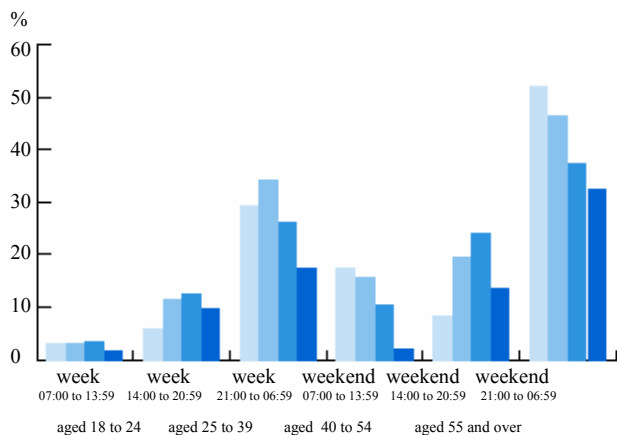
Matching the social patterns of alcohol consumption with the severity of the accident highlights the particular nature of this type of accident, often described in earlier studies, with a concentration on weekend nights and open country roads and a strong connection with recreational journeys. We thus see that 50% of accident victims, both young (18 to 24) and not so young (25 to 39), involved in fatal accidents on weekend nights are over the legal alcohol limit.

This notable specificity of alcohol-related accidents has remained stable over recent years and enables preventive blood testing strategies to be effectively targeted. From the epidemiological point of view, it facilitates the indirect study of the part played by alcohol in the occurrence of accidents: it is sufficient to use the series made up of these specific targets. If there is a significant fall in fatal accidents during weekend nights, there is no doubt that this is due to a reduction in driving under the influence of alcohol.

**Accidents with alcohol implicated are serious accidents; the departments are not equally affected**

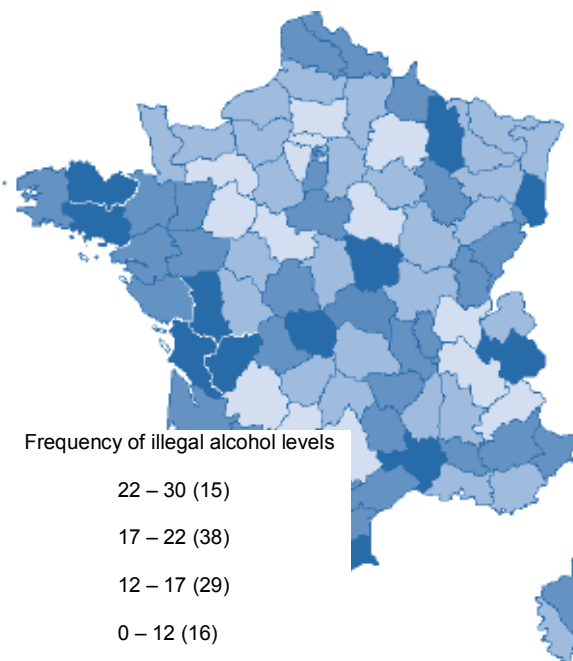
Alcohol is indisputably a factor in the seriousness of the accident, as is shown by many results. The more seriously the victim is injured, the higher the probability that he or she was over the legal limit at the time of the accident and the higher his alcohol level. The departmental geographical repartition of the implication of alcohol in accidents is very similar to that of the severity of accidents.

**Proportions of drivers with illegal alcohol levels in fatal accidents (by age, time of day, week/weekend)**



Furthermore, some of the departmental and regional differences are shown in work on mapping alcohol consumption and morbidity in the departments. The cartographic analysis started in this study would benefit from greater emphasis. The comparison of local accident data with local data on preventive alcohol testing should offer further possibilities for evaluating local policies to combat drink-driving.

**Frequency of illegal alcohol levels (%) in drivers and pedestrians involved in fatal accidents**

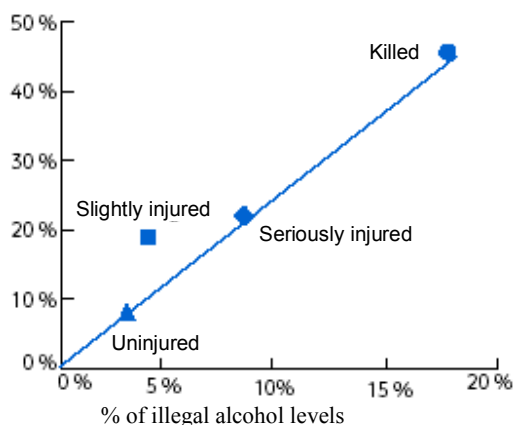


**A correction of the data can improve the assessments**

The impact of missing data on the evaluation of involvement under the influence of alcohol is all the greater as the uncertainty relatively frequently affects those involved who are likely to be above the legal limit. In fact, it seems that one of the variables most closely correlated with both the likelihood that the alcohol level is known and the probability of drink-driving is the state of the person involved: uninjured, slightly injured, seriously injured or killed. Applying corrections based on this hypothesis and using the state of the injured person as an intermediate variable, the frequencies of drivers or pedestrians above the legal limit are significantly increased: the estimated proportions rise, for all accidents with personal injury, from 5.5% to 6.7%, for all fatal accidents, from 16.8% to 21.7% and for those drivers supposed to be responsible for fatal accidents from 25.4% to 31.7%. This shows the under-estimation of the fatal accident phenomenon by the official figures based only on known alcohol results (from 20% up to 30%, depending on the population considered). Other variables accounting for this data not being available have been identified: the type of road user, the body making the test, the region etc.

The correction of the data on alcohol levels in accidents by the methods proposed reduces the under-estimation resulting from missing data. The results are, however, still under-estimated. Two other sources of under-estimation have been identified: the delay between the occurrence of the accident and the alcohol test, which can be from one to two hours, and the fact that some results, from breathalyser tests, are not reported in the BAAC but attributed the default value of zero. The suggested corrections must be developed to continue improving the indicators and assist the public authorities in their tasks of evaluation and action.

**Frequency of illegal alcohol levels and rates of undetermined alcohol levels as a function of the state of the road user**



### Developments during the decade show the benefit of the preventive policy of random testing

The policy of intensive preventive testing (more than 8 million tests per year) contributed to the containment of the problem. The proportion of accidents in which alcohol was implicated did not increase during the decade; rather, there was an overall decrease. Over the last three years (1999 – 2001) the figures from the BAAC files are remarkably stable:

- ⊃ between 5% and 6 % of drivers involved in accidents with personal injury were above the legal alcohol limit, with this proportion rising to 16 % to 17 % for fatal accidents,
- ⊃ around 10% of accidents with personal injury involve a driver over the legal limit; for fatal accidents this proportion stands around 30%.

The pattern of accidents and accident victims where alcohol is implicated are remarkably consistent and specific. They appear to relate to social habits that are particularly firmly anchored in male populations between the ages of 18 and 55. The accidents are serious and show a combination of some of the following characteristics: accident by night, at the weekend, on a departmental or national road, without collision (involving only one car), outside built-up areas, frequently on a bend, with vehicles over 8 years old.

Only new and innovative preventive measures might break this pattern.

The study presented is a contribution to progress in the evaluation of the part played by alcohol in road accidents. The decision-makers responsible for managing road safety need reliable indicators. While we now observe a notable and continuous decrease in the numbers of deaths on roads since the second half of 2002, the method and results presented make it possible from now on to carry out a rigorous analysis of the part played by alcohol.

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INRETS (National Institute for Transport and Safety Research) is a public research institute placed under the joint supervision of the french Ministries in charge of Research and Transport. Its major priority missions are:

- ⊃ to organize, execute and assess research characterised by a comprehensive approach to transport systems,
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