

**Summary:**

# **Safety Performance Indicator for Alcohol in the SafetyNet Project**

## **- Data quality in selected countries and comparison with other alcohol indicators**

**The European SafetyNet project has developed a safety performance indicator (SPI) for fatalities in alcohol related road accidents, in order to facilitate indication and comparison of road safety performance in different countries and for different years. However, the data used for calculation of the SPI are not reliable for all countries. Until the data quality are improved, comparison across countries should be made with caution.**

### **Is the indicator correct?**

In the European SafetyNet project, safety performance indicators (SPIs) have been developed for seven areas, including the use of alcohol in road traffic. SPIs are used to indicate and compare road safety performance in different countries, to understand the process leading to accidents, and to help decide on the measures to reduce them. The alcohol SPI is defined as the percentage of fatalities resulting from accidents involving at least one driver impaired by alcohol.

A calculation of the alcohol SPI for 26 countries shows that the SPI varies from 4.4 % in Bulgaria to 72.2 % in Italy. Figure S.1 shows the SPI for all countries included.

The large variation between the very low and very high indicators raises the question if the alcohol SPI results can be trusted for comparison as intended. The following questions are examined:

1. Do the SPI results reflect the real situation in the different countries?
2. Is there a methodological explanation to the differences, such as incomplete and unreliable data or different ways of collecting data or calculating the SPI?

To answer these questions three different studies have been formed:

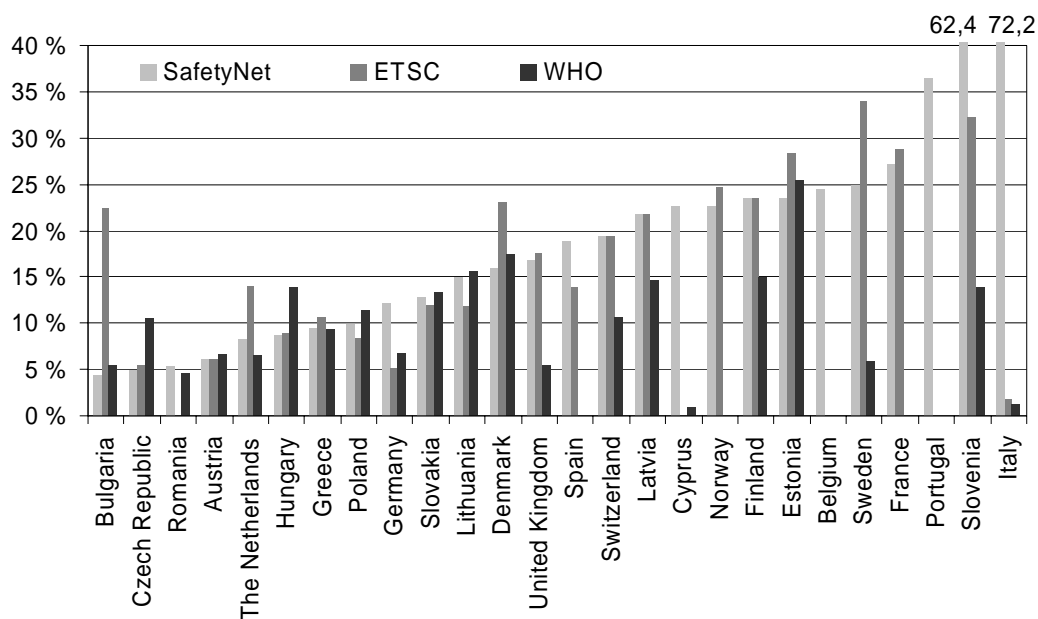
1. Comparison with other alcohol SPI calculations
2. In-depth studies of data quality in five selected countries
3. Study of correlations between the SPI and possible influencing factors.

### Three systems of SPIs with differing results

Figure S.1 compares the alcohol SPI for SafetyNet 2005 to SPIs from the European Transport Safety Council (ETSC) and the World Health Organization (WHO), which have also developed different sets of SPIs for road accidents.

The ETSC SPI focuses on annual changes. However, it is also possible to calculate an SPI similar to the SafetyNet SPI. The WHO SPI is defined as accidents involving alcohol per accident with injury and cannot be compared directly to the SafetyNet SPI. However, the two rankings should correlate if data for the two rankings are correct.

The comparison between SafetyNet and ETSC reveals some interesting similarities and differences. Italy has an extremely high SafetyNet SPI value, 72.2 % and an extremely low ETSC value, 1.8 %. In other words Italy is ranked as the worst country in SafetyNet and as the best country in ETSC. There are also large differences for Slovenia, Germany, Spain, Sweden, Norway, Denmark, the Netherlands, and Estonia. These differences are between 5 and 26 percentage points. This means that only half the countries have a good accordance between the two systems of safety performance indicators.



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Figure S.1. Alcohol safety performance indicator for SafetyNet 2005, ETSC 2005 and WHO 2005 for 26 European countries. The countries are ranked by SPI for SafetyNet 2005. All countries are not included in all three rankings. Numbers for SafetyNet 2007 are used for Bulgaria, Romania and Slovenia. WHO SPI cannot be compared directly to the other SPIs because it is based on accidents rather than fatalities.

The comparison between SafetyNet and WHO are done by comparing the country ranks. The correlation between the two ranks is calculated to 0.07, i.e. the comparison shows no correlation. The largest negative differences, calculated as the rank for SPI minus the rank for WHO, are found for Hungary, the Czech Republic, Lithuania and Denmark. This means that these countries have a low or medium SafetyNet SPI and a high WHO SPI. The largest positive differences are

found for Italy, Sweden and Cyprus, which also had the largest positive differences in the comparison between SafetyNet and ETSC.

A WHO SPI calculated as accidents involving alcohol per 100,000 persons has also been compared to the SafetyNet alcohol SPI. This correlation is -0.11, an even more unexpected result.

These three comparisons indicate clearly that at least one or two of the data sources are unreliable for several countries.

## Unreliable data for four out of five selected countries

Studies of the quality of the data provided for the calculation of the SPI have been carried out for the Czech Republic, Austria, Norway, Sweden and France. The Czech Republic and Austria were chosen because they had the lowest and second lowest SPI in SafetyNet 2005. France was chosen because it had the second highest alcohol SPI in SafetyNet 2005 and because it was impossible to make a reasonable study for Italy. Sweden and Norway also had high SPI results, but not the most extreme. However, they have a high SPI even though they have very low alcohol consumption and are among the safest countries in Europe.

The results of the studies are summarized in table S.1. For France it is concluded that the SPI is likely to have the right level. For Austria and the Czech Republic the conclusions are that the SPIs provided are too low, but it is difficult to make exact estimates of the SPI. For both Austria and the Czech Republic the SPIs are estimated to be about 18-19 %. For Sweden and Norway the new estimates made are considerably lower than the ones provided to SafetyNet.

Table S.1. Alcohol SPI from SafetyNet 2005 and the in-depth studies for five countries.

	The Czech Rep.	Austria	Norway	Sweden	France
<b>SPI</b>	4.8 % → (18.8 %)	5.9 % → (18.0 %)	22.2 % → 11.1 %	25.0 % → 16.0 %	27.2 %

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Of a total of five countries studied, the data quality is considered good enough for only one. Consequently, there may be reason to believe that more countries have incomplete data as bases for the calculation of their alcohol SPI.

There are several reasons found in the study that could explain why the data sets are incomplete:

- The costs of autopsy of killed drivers are perceived as too high when there is no reason to check for alcohol as the killed drivers cannot be prosecuted.
- Testing people killed in accidents may be legally prohibited unless there is a strong suspicion.
- Privacy. Even if autopsies including alcohol analysis are carried out, the results are not reported back to the police for reasons of privacy.
- Time-consuming routines. The police may have to make formal requests to the hospitals to get the results of the autopsy.
- When the person dies several days after the accident it is too late to check the BAC.
- Data needed are collected, but no statistics are compiled or the statistics are published in a way that makes the SPI calculation impossible.

## No correlation with possible influencing factors

Apart from methodological reasons, variation in the alcohol SPI could to some extent be explained by and be expected to correlate with all or some of the factors:

1. Legal BAC limits
2. Drink-driving prevalence
3. Alcohol consumption
4. Motorisation
5. Self-reported behaviour
6. Demographic factors
7. Norms and culture
8. Enforcement
9. Information campaigns
10. Driver training.

In this project the correlations between the SPI and the legal BAC limit, drink-driving prevalence, alcohol consumption, motorisation, and self-reported behaviour are studied. These factors have been chosen because existing relevant data for these factors can be used in an analysis.

Table S.2 summarizes the results. Surprisingly there is no correlation or only a very small correlation between the rank for SPI and the rank for possible influencing factors. The largest correlation is found for self-reported behaviour, where car drivers are asked how many times they have been drinking and driving last week. The second largest correlation is found for motorisation. The correlations for alcohol prevalence and alcohol consumption are only 0.15 and 0.17.

*Table S.2. Correlation between country ranking for the SafetyNet Alcohol SPI 2005 and country ranking for possible influencing factors.*

	BAC limit	Prevalence	Consump- tion	Motor- isation	Self-reported behaviour		Controls
					Drink and drive last week	Accident cause	
<b>Correlation</b>	0.10 (R <sup>2</sup> )	0.15	0.17	0.32	0.36	-0.26	-0.12

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Two overall explanations for the missing correlation are possible. Either 1) some of the data for the SPIs or the possible influencing factors may be incorrect, biased or not representative or 2) the assumed correlation between SPI and the other indicators does not exist because the SPI to a greater extent correlate with factors not included in this study, such as demographic factors, norms and culture, or information campaigns and driver training.

Only further research can decide whether this lack of correlation is due to poor quality of the SPI data or to substantive reasons, but this lack of correlation is an indication that there may be problems with the quality of the SPI data.

## Improved data quality

The three studies show clearly that there is a need to improve the quality of the data on the basis of which the alcohol SPI is calculated. The following information should be reported:

- The total number of drivers involved in fatal accidents
- The number tested for alcohol and the number not tested
- The number of alcohol positive and negative drivers among those tested.

When these figures are made available, adjusted SPI results can be estimated. Until these improvements are made, it is advisable to exercise great caution when comparing alcohol SPI results across countries.