

Alcohol and Drug Consumption by Québec Truck Drivers

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Keywords

Alcohol, drugs, truck driver, survey

Abstract

The Société de l'assurance automobile du Québec conducted a roadside survey in June 2001 on truck drivers to assess their use of alcohol and/or drugs. SAAQ motor carrier enforcement officers intercepted a total of 2,803 truckers who were asked to take part in the survey, of whom 2,679 (96%) eligible drivers agreed to participate. Of that number, 2,172 (81%) gave a urine sample, 2,541(95%) a saliva sample and 2,629 (98%) a breath sample.

Chemists at the Centre de toxicologie du Québec were entrusted with analysis of the biological samples. The roadside collection of samples required elaborate planning. Achieving optimal participation was kept in mind in setting up the survey, which was considered in that light under all its aspects. Only two truck drivers (0.03 %) had a BAC above 0.08, while another 6 (0.2 %) had a BAC between 0.02 and 0.08. According to the toxicological analysis of urine samples, drugs were found in the following proportions: cannabis (4,8 %) , amphetamines (2,9%), cocaine (1,4 %), opiates (0,6%) and benzodiazepines (0,3%)

INTRODUCTION

This investigative study was conducted among truck drivers as part of an epidemiological study to establish the extent of alcohol and drug use by Quebec drivers. The study on alcohol and drug use by truck drivers was conducted to ascertain prevalence among this population group in Québec. The substances screened include drugs such as cannabis, amphetamines, cocaine, opiates and benzodiazepines. Total expenses linked to the study amounted to \$235,000, nearly one-half of which (\$131,600) was devoted to the analysis of biological specimens. Quebec's automobile insurance corporation, known as the SAAQ, funded the study, which was also supported by a \$50,000 grant from Transport Canada.

METHODOLOGY

The population segment targetted by this survey was Québec truck drivers (vehicles weighing 3,000 kg or more). The sampling plan devised for the roadside survey for use in the study was

based on the number of sites in the region proportionate to the number of holders of a driver's licence granting the authorization to operate vehicles of more than 4,500 kg for the purpose of hauling goods (Class 1 and 3 licences).

The sites to conduct the roadside survey were selected according to one main criterion among a set list of criteria: they primarily had to be safe locations for all concerned. In all, 81 sites were selected along Québec's road network: along streets in urban settings, along main thoroughfares and along highways. These allowed for a fair degree of representation of all truck drivers, as they included routes taken for both short and long hauls.

Observation periods

Observation periods were established based on the enumeration of trucks. Days were grouped as follows -- Saturday and Sunday as one period, and the rest of the days of the week as another. Time periods were divided in terms of the classes represented in the table opposite.

Our plan included conducting 120 survey periods, executed between May 27 and June 23, 2001.

Table 1: Itemized account of trucks according to time of day and week

Time period	Week	Weekend
Day: 6:00 a.m. to 5:59 p.m.	56 %	10 %
Evening: 6:00 p.m. to 11:59 p.m.	18 %	4 %
Night: 12:00 a.m. to 5:59 a.m.	10 %	2 %

Interview procedure

Motor carrier transport enforcement officers intercepted trucks in random fashion, as follows: when an investigator was available to conduct an interview, an officer would intercept the next heavy vehicle to come along. The investigators were in fact mostly female students studying in the field of nursing techniques. For each truck driver intercepted, they conducted an interview and recorded the information gathered onto a questionnaire. The information sought included the following: driver characteristics (i.e. gender, age, region of residence, number of kilometres travelled per year) and their habitual consumption of alcohol, medications and drugs (including stimulant drugs).

After filling out a questionnaire, the investigator would request a sample of the driver's breath, urine and saliva. If the driver agreed to provide a urine sample, he was awarded with a cap at the end of the interview. Based on pilot project, the increase in survey participation by the incentive of giving a cap to urine donors was estimated at between 7 and 10 percentage points.

Samples

The first sample, the breath sample, was obtained using an alcohol-screening device (ALCO-SENSOR IV). The second sample requested of a driver was for urine. Finally, the investigator would ask the truck driver for a saliva sample. The material used to collect the urine and saliva samples were provided by the Starstedt Company. All biological specimens (i.e. urine and saliva) were, right from the observation period, kept cool with ice packs until shipping time.

Toxicological analyses

All urine and saliva samples were tested at the Laboratoire du Centre de Toxicologie du Québec (the forensic laboratory of Québec's public safety department), and frozen upon arrival for subsequent screening. The second stage was the confirmation of positive findings through

chromatography in the phase termed gaseous / mass spectrometry (GC / MS) or by liquid phase chromatography / mass spectrometry (LC / Tandem MS).

Immunological and confirmation analyses were conducted directly from the urine and saliva samples according to the cut-off values stipulated by SAMSHA (Substance Abuse and Mental Health Services Administration). The mass spectrometry method was used to confirm the values in the samples. Samples whose immunological findings proved lower than those values were not extracted to confirm the presence of the analyte.

Estimation method

The estimation method used for the results is a stratified sampling procedure proportionate to the region of residence of drivers with an irregular probability of being selected. That probability is determined by the period of the day, the week and the proportion load capacity of the truck for such features.

The estimation formula for the proportions is as follows:

$$p = \frac{\sum W_r \sum W_t p_{tr}}{\sum W_r \sum W_t}$$

where the variables

W_r represents the weight associated with the driver of region r

W_t represent the weight associated with the count of trucks over time t

p_{tr} represents the proportion of a given feature x over time t within region r

and where the indices:

t : represents the time period (combination of the period in the day and of the week)

r : regions of residence, from 1 to 17

Non-respondents

Despite all the measures taken to minimize the likeliness of refusal to provide a urine sample, it was inevitable that certain individuals would refuse. To attenuate the impact of this situation, the investigators did insist that the individuals questioned give a saliva sample. This was done to prove the following hypothesis:

The real reason for refusing to provide a urine sample after having provided a saliva sample is not to conceal drug or medication consumption since, had respondents wanted to “hide” their use, they would simply have refused to provide any sample whatsoever.

According to our results, it is possible that this assumption is right, since nearly 3 %, among those which refused to give urine and which gave saliva, had a positive sample for at least one of drugs. Therefore, when saliva is given and urine is refused the gift is not to hide its consumption.

FINDINGS

Features of sample

The findings presented in this section are raw figures. In all, there were:

- 2,801 drivers intercepted by motor carrier enforcement officers
- 2,666 drivers agreed to participate, representing 95% of drivers intercepted

- 2,629 provided a breath sample (99% of participants, or 94% of drivers intercepted)
- 2,167 gave a urine sample (81% of participants, or 77% of drivers intercepted)
- 2,328 gave a saliva sample (87% of participants, or 83% of drivers intercepted)
- 2,499 provided both urine and saliva samples (94% of participants, or 89% of drivers intercepted)

Driver participation in the various stages of the roadside survey was similar for all age groups. Of the participants, only 28 drivers were women, hence there were only 1% of female drivers in our sample.

Estimated findings

Of the drivers interviewed, 82.9% were between age 25 and 54 years and only 1% of drivers were between 65 and 74 years of age.

Alcohol consumption

A little more than half the truckers (61.0%) drink between zero and 2 alcoholic beverages per week, and 25.6% have between 3 and 6 beverages per week. Only 1.7% are heavy drinkers: 15 or more drinks per week. Only 27 truck drivers admitted to having consumed alcohol during the day of the survey, which represents 0.9% of the trucking population. While the survey was being conducted, two truck drivers had a blood-alcohol level higher than the legal limit, accounting for 0.03% of this population group. Furthermore, six truckers had traces of alcohol in their blood, but below the limit (between 20 and 80 mg), making up 0.2% of the population.

Consumption of drugs

All findings that indicate the prevalence of a drug emanate from the analysis of urine samples at the laboratory of Centre de toxicologie du Québec as mentioned earlier. It should be pointed out that a prevalence of drugs in the urine samples merely indicates that a certain substance was present in the urine, and not that the truck driver was under the influence of that drug at the time of the survey.

The table below shows the proportion of truckers who had consumed drugs as well as the proportion who admitted to such consumption in the week or the year under way.

Table 2 : Proportion of truck drivers who used drugs according to the type of drug and age, and the proportion of consumers who admitted to such use

Age of drug user	Proportion of consumers of:					
	Amphetamines	Cannabis	Cocaine	Opiates	Benzodiazepines	
Missing data	0%	0%	0%	0%	0%	
18-24 yrs.	2.0% (2.4%)	14.5% (7.8%)	2.1% (2.8%)	1.6% (2.9%)	0%	
25-34 yrs.	3.4% (1.9%)	7.0% (2.6%)	2.0% (1.5%)	0.4% (0.6%)	0%	
35-44 yrs.	2.8% (1.3%)	5.5% (1.9%)	1.7% (0.9%)	0.3% (0.4%)	4.9% (0.8%)	
45-54 yrs.	2.4% (1.5%)	2.3% (1.4%)	1.1% (1.2%)	0.9% (0.9%)	0.2% (0.3%)	
55-64 yrs.	3.4% (2.2%)	0.3% (0.5%)	0%	0.3% (0.5%)	0.5% (0.9%)	
65-74 yrs.	5.3% (10.1%)	0%	0%	0%	0%	
Total	2.9% (0.8%)	4.8% (1.0%)	1.4% (0.6%)	0.6% (0.3%)	0.3% (0.3%)	
Users who admitted their consumption						
	2.1% (3.9%)	43.5% (10.9%)	6.7% (8.7%)	16.0% (19.8%)	73.8% (29.1%)	

A figure in parentheses accompanying the estimates represents the margin of error.

Cannabis

Of the 2,163 urine donors, 4.8% showed traces of a cannabis metabolite (THC-COOH) in their urine.

Of the group, 14.5% of the 18-24-age group had consumed cannabis, that is, there were traces of cannabis in their urine.

Given the greater number of users of cannabis compared to other drugs, an estimate of the proportion of consumers according to the period of the day or week was computed. Taking into account the margin of error, there was no significant difference with regard to either period.

Table 3 : Proportion of cannabis users according to period of week or period in day

	Proportion	Margin of error
Period of the week		
Monday to Friday	7.3%	(4.7%)
Saturday and Sunday	4.5%	(1.0%)
Period of the day		
6:00 a.m. – 5:59 p.m.	4.9%	(1.2%)
6:00 p.m. – 11:59 p.m.	3.0%	(3.0%)
0:00 a.m. – 5:59 a.m.	5.2%	(2.8%)

Amphetamines

When screening for amphetamines in the urine samples, the following metabolites: ephedrine, pseudo-ephedrine, methamphetamine, were detected among 2.9% of the truckers. During the survey, the investigators questioned the participants on their consumption of stimulants other than a medication or an illicit drug. When we examine the non-weighted results, we see that of the 76 answers, 57 participants had responded they had had coffee (tea, or caffeine pills). Other answers of interest are mainly the following: “wake-up” pills (6), speed (1), ephedrine (1) and cocaine (1). The results broken down into the different age groups show no significant difference.

Cocaine

Cocaine showed up in 1.4% of the truckers’ urine samples in the form of benzoylecgonine. Of those 29 consumers, only two (6.7%) admitted to having taken cocaine or a stimulant resembling “coke” in the preceding week or year. In the truck-driver population, the proportion of those who had consumed cocaine was the same, regardless of the age group.

Opiates

The metabolites discovered in the urine samples were: codeine, hydrocodone, and morphine. Among the urine samples given during the survey, 0.6% had traces of opiates in their urine, and of those, 16.0% admitted to having taken narcotic analgesics or opiates in the preceding week or year. Since there were only a few consumers of opiates, it was difficult to detect a difference according to user age when taking into account the margin of error.

Benzodiazepines

Benzodiazepines are medications in the same category as sleeping pills (sedatives), anti-anxiety tablets, antidepressants, antipsychotics, convulsant antidote and antiparkinsonians. There was 0.3% of urine samples with traces of temazepam or oxazepam of which 73.8% of truckers admitted to have taken benzodiazepines.

CONCLUSION AND DISCUSSION

The survey's participation rate was high, as 83% of those intercepted agreed to answer the questions and provide a saliva sample. In a comparable survey carried out in Australia¹, the response rate was 58%. The presence of non-respondents is likely to pose a bias to the estimates. However, if the people who refused to take part were people who feared the detection of drugs and/or alcohol in their systems, this would imply that the basis of the findings would be proportionately underestimated. Examining participation based on age, weather conditions and so on, provides little support to the existence of a bias.

The percentage of truckers in an inebriated state on the road network is very low, with merely 0.03% exceeding the legal limit. It thus appears that the problem of drunk driving is not as prevalent among truck drivers as among the operators of passenger vehicles (2%). These findings concerning truckers is comparable to other results obtained in similar surveys: Tennessee (1985)², less than 1%; Virginia (1997)³, 0.2%.

Among the population of truck drivers, 9.0% (1.4%) had traces of at least one of the following drugs: cannabis, amphetamines, cocaine, opiates, benzodiazepines, and close to half of whom had consumed cannabis. The presence of a drug in an individual's urine does not imply that he or she was under the influence of that drug at the time of the survey.

A more elaborate study on the nature and quantity of the metabolites found could eventually help us determine a level of disability. Additional analyses on the metabolites of the samples containing amphetamines showed that most of the positive cases to the amphetamines were the pseudo-ephedrine, that finds in many products on free sale.

The findings obtained on the prevalence of drugs, along with those on occurrences of admitting drug consumption show that a voluntary confession, unchecked by analyses, would probably lead to an underestimation in the number of users. In the case of drugs such as opiates (16.0%), cocaine (6.7%) and amphetamines (2.1%), the predicament is all the more acute.

References

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