Survey Guidelines to Assess Driver Alcohol & Drug Use

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ABSTRACT

Context: Roadside surveys of alcohol use among drivers have been used for many years to measure the prevalence of alcohol use among drivers. The technique involves randomly selecting drivers from the traffic flow and asking them to provide a sample of breath. Whereas other measures of the drinking-driving problem rely on official reports of events that have come to attention of police (i.e., crashes and arrests), roadside surveys provide an estimate of the extent to which drivers in the general population have been drinking. Over time this method has been modified to include the collection of drug use from drivers as well as examining the collection of data during daytime hours.

Objectives: A standard protocol for these surveys is required to compare results across jurisdictions and/or over time. The objective of this project was to describe a standard protocol for conducting a roadside survey to determine the prevalence of alcohol and drug use among nighttime drivers. In addition, the document addresses many of the issues and questions that arise when a roadside survey is being considered and provides an overview of many of the steps required to help ensure a successful project.

Key Outcomes: A roadside survey is a major effort that requires considerable forethought, planning, negotiations with key stakeholders and partners, and the development of a detailed protocol for the survey. It is an intensive effort that requires a tremendous amount of preparation. The key to a successful project is careful planning and a standard protocol will provide guidance in this process.

Discussion and conclusions: This protocol has been developed over time and modified to add drug collection and examine the use of daytime sites. These procedures have been tested and improved in multiple surveys conducted in Canada over past decades. The result is a protocol that addresses key issues and concerns and provides valid measurements of general alcohol and drug use on a jurisdiction’s roads which can be monitored overtime or used as a before and after measurement system.

BACKGROUND

One of the first reported roadside breath testing surveys was conducted in Evanston Illinois over 70 years ago (Holcomb, 1938). The first roadside breath testing survey in Canada was conducted in Toronto in 1951-52 (Lucas et al, 1955). Perhaps the most often cited survey of this type was conducted in Grand Rapids, Michigan as part of a case-control study during the early 1960s by Dr. Robert Borkenstein and colleagues (Borkenstein et al, 1964). This study was instrumental in establishing the increased risks associated with driving with elevated blood alcohol concentrations (BACs) and in setting per se limits for the legal BAC threshold.
By 1971, a total of 19 roadside surveys had been conducted in eight countries. The results of this research served to underscore the importance of this type of survey for determining the magnitude of the drinking-driving problem and for the evaluation of countermeasure strategies and programs. However, the use of different methodologies and analytic techniques rendered it difficult to compare the results among countries.

In 1972, under the auspices of the Organization for Economic Cooperation and Development (OECD), an international group of scientists chaired by Dr. Carl Stroh of Canada was charged with the responsibility of developing a research protocol for the conduct of roadside breath testing surveys (Stroh, 1974). The standard methodology was first used in a pilot roadside survey project conducted by Transport Canada in Alberta and New Brunswick. The success of the pilot project led to the 1974 National Roadside Survey of the BACs of the driving population (Smith et al, 1976). Since that time a number of surveys have been conducted in a few Canadian jurisdictions.

In the United States, roadside surveys have been conducted periodically to monitor the prevalence and extent of alcohol use by drivers. The first national roadside survey in the United States was conducted in 1973 (Wolfe, 1974). National surveys in the United States were also completed in 1986 (Lund & Wolfe, 1991) and 1996. Most recently, a national alcohol and drug roadside survey was conducted in 2007 (Lacy et al, 2009). At least two states (Minnesota, North Carolina) have undertaken independent state-wide roadside surveys (Foss et al, 1997).

Roadside surveys have also been conducted for many years in several parts of Europe (Germany, Sweden, Belgium, Netherlands, Finland, and the United Kingdom). Australia (Perth, New South Wales), and Africa (Kenya, South Africa) (Jackson, 2008). Although the general approach is similar to surveys conducted in North America, variations in procedures are common – e.g., days of the week, time of day, site selection, conducted at night. In countries where random breath test laws (e.g., Australia) require drivers to provide a breath test when requested by a police officer, it is common for the survey to be conducted by enforcement personnel. As might be expected in this situation where refusal to provide a sample can have legal ramifications, response rates are very high.

**SURVEY METHOD**

The purpose of a roadside survey is to obtain an estimate of the prevalence of alcohol and drug use among a random sample of drivers on the road. Collecting these data from drivers at randomly selected locations throughout the targeted communities ensures a valid and reliable estimate of the overall prevalence of alcohol and drug use. This goal can often be different than impaired driving enforcement activities such as police impaired driving check stops. Quite often the enforcement activity is not done at a random location, for a specified period of time and is more selective in which vehicles/drivers are selected for assessment. The situation is different in jurisdictions with random breath test legislation, as drivers can be compelled to provide a breath sample.

The roadside survey method used throughout North America has evolved from the original research protocol developed and approved by the OECD in 1972. The sampling procedures remain the same but the survey methods have been streamlined and updated to take advantage of advancements in breath test technology.
There are a number of significant partners to be considered when developing a roadside survey. Police services in the regions where the survey will take place are key partners to manage traffic on the road and redirect vehicles into the study area. The use of off duty officers can provide more control over their involvement in the study and it is important that officers understand their contribution is to direct traffic into the site safely and count the passing vehicles for weighting purposes.

Other sponsors of the survey can be useful to provide a small incentive for drivers to participate. Such an incentive tends to increase the response rates in these surveys and can offer some profile for the sponsoring organization.

The selection of the sites is key to the validity of conclusions drawn from the results and should be done through random assignment. Site selection requires the survey region to be specified in advance, (i.e. the boundary of a city). A numbered grid is then applied to a map of the region. The grids to be surveyed are randomly selected and all possible survey sites within the grid form the population and the survey sites are selected, without replacement. All selected sites should be visited to ensure they comply with the site operational and safety requirements.

The survey is conducted by a team of interviewers who have been specially trained in survey operations, interview techniques, and the use of the breath alcohol test and oral fluid collection equipment. In addition to four to five interviewers, a survey team should include a crew chief to supervise the site and address challenges, a police officer to stop and direct traffic into the site and count passing vehicles, and a traffic coordinator to direct traffic into the survey bays.

Often these types of surveys take place during the evening and early morning periods of selected days. Multiple teams can be utilized in a specific geographic location in one evening. Restricting the time at each site allows for greater geographic representation and prevents drivers from either avoiding the site or repeatedly driving past the site in an attempt to be selected to obtain incentives.

Survey sites are usually set up in an area off the travelled roadway such as in a parking lot. The sites must be selected in advance to ensure sufficient travel flow past the site during the survey times, the appropriateness of the site in terms of lighting and ingress and egress for vehicles and to seek advance approval and permission from the property owner to use the site and potentially leave a few vehicles on the site until the next day. This affords a greater degree of safety for the survey team and drivers than would be the case if interviews were conducted on the side of the road. This approach also permits several interviews to be conducted simultaneously.

When an interviewer is ready to begin an interview, the traffic coordinator signals the police officer to select the very next eligible vehicle (i.e., non-commercial light duty vehicle) from the traffic flow and direct it into the survey site. It is essential that the police officer select the next vehicle that can be stopped safely to ensure a pseudo-random selection of vehicles from the traffic stream.

The traffic coordinator then directs the driver to an empty bay and the interviewer first greets the driver, outlines the general nature of the survey and hands the driver a card that explains the details
of the survey. After the driver has agreed to participate, the interviewer ensures that the driver understands that the interview is voluntary and confidential. The interview typically includes a short series of questions concerning attitudes, opinions, and knowledge about drinking and driving. The purpose of the questions is not only to gather pertinent information about drivers and their opinions about impaired driving issues but also to provide a brief opportunity for the driver to become comfortable with the interviewer, to allow the driver to feel that they are contributing, and to facilitate the transition to providing a breath sample.

The interview concludes with the driver voluntarily providing a breath sample into a small, hand-held breath testing device approved for use. Some drivers may attempt to provide an incomplete sample and interviewers must be taught how to recognize and address this issue.

Drivers who are below the jurisdictional administrative or legal limit are thanked and directed off the site. Drivers with a BAC in excess of the administrative or legal limit for the jurisdiction are asked to speak with the Crew Chief who engages the driver in a conversation for a few minutes prior to administering a second breath test with a different device. This interval helps to ensure that any mouth alcohol that might possibly have contaminated the first reading will have dissipated. The purpose of the second breath test is to confirm the result of the first test and to demonstrate to the individual that they should not be driving. Alternative transportation home should be provided possibly by taxi or volunteers. The vehicle can be left at the site if no non-impaired passenger is able to take over behind the wheel. No person with a BAC over the limit for that driver’s status is allowed to drive away from the survey site.

A PROTOCOL FOR DRUG TESTING

At one level, expanding a roadside alcohol survey to include drugs merely involves the addition of a drug test into the protocol. However, in reality it is not quite so simple. There are numerous issues to be considered. Firstly, the issue of sample medium must be decided. Whereas breath has been the sample medium of choice for alcohol testing in surveys and enforcement, breath cannot be used to assess drug use among drivers. The choices are urine, blood, and oral fluid. Each has its strengths and limitations.

Urine has long been used as a medium for drug testing. Although not generally considered to be as intrusive as blood sampling, participants require a private and sanitary place to provide the sample and many people are reluctant to volunteer. The major drawback of urine as a sample medium, however, is that levels of substances detected in urine do not necessarily represent levels of active drugs and, in some cases, may reflect inactive drug metabolites that have no effect on driver behaviour. Of particular interest in this context are cannabis metabolites, which can be detected in urine up to several weeks after use.

Blood is the medium of choice for detecting and measuring drug levels. Drug levels in blood reflect pharmacologically active substances most likely associated with observed levels of behavioural and cognitive impairment. The major limitation is the intrusiveness involved in obtaining a blood sample. A qualified phlebotomist must be employed to collect samples in a safe and healthy manner. Besides issues of liability surrounding the drawing of the blood sample, drivers are often reluctant to provide a sample of blood, especially at the side of the road.
Laboratory testing of blood samples is expensive but generally provides the most valid evidence of drug use.

Oral fluid is becoming the medium of choice for quick, unobtrusive, and accurate screening and testing of psychoactive substances. Oral fluid can be collected while the driver remains in the vehicle by means of an absorbent pad attached to a plastic stick placed under the tongue or between the teeth and cheek for a few minutes. Drugs detected in oral fluid are better correlated with active drug levels in the blood than is the case with urine. The major limitation of oral fluid is limited transfer of some drugs to oral fluid – e.g., benzodiazepines do not transfer well. The amount of fluid collected can also be a limiting factor. Some people have difficulty producing a sufficient volume of oral fluid in a brief period of time. A minimum of 1ml of fluid is required for testing. Rather than relying on the passage of a set period of time to gather an oral fluid sample, some collection devices provide a visual display that indicates when sufficient fluid has been collected.

Adding the collection of oral fluid samples to the procedure increases the amount of time required to complete each interview. Hence, rather than the three to four minutes required for alcohol surveys, interviews that seek to obtain samples to test for both alcohol and drugs will require an average of seven to eight minutes. This will reduce the number of interviews that can be collected in the allotted time at each site and reduce the overall sample size.

Typically the oral fluid samples will have to be sent by courier to a certified lab for analysis for commonly found drugs of interest. Samples are initially screened in the lab for cannabis, cocaine, opiates, amphetamines, methamphetamine, and benzodiazepines using enzyme immunoassay technology. Samples with a positive screen are confirmed by gas chromatography/mass spectrometry (GC/MS) at an pre-approved detection level.

The analysis of these types of data are somewhat complex. The data need to weighted by the total number of passing vehicles to reflect the relative contributions of each site. This is the data element the police officer collects at the time of the survey. All regions being surveyed are not the same in terms of driver and population density, gender breakdowns and perhaps other important factors. In order to make the data the most representative for the entire jurisdiction it is important the sites and vehicles be randomly selected and the data be weighted appropriately. The selection of the weighing methodology is very important in terms of the validity of the results. Monitoring the refusal rates for both drug and alcohol measurement is very important in terms of interpreting the results of the survey.

CONCLUSIONS

Roadside alcohol and drug surveys provide a wealth of information about the prevalence of alcohol and drug use among the general population of drivers who have not come to the attention of police through crash involvement or arrest. Surveys of this nature offer an opportunity to examine the extent of this risky behaviour, the circumstances under which it occurs, and the characteristics of those who are involved. The information is of tremendous value in the development and implementation of prevention, intervention, and enforcement programs. In addition, roadside surveys can be utilized to help evaluate the impact of countermeasure programs.
A roadside survey is a major effort that requires considerable forethought, planning, negotiations with key stakeholders and partners, and the development of a detailed protocol for the survey. It is an intensive effort that requires a tremendous amount of preparation. The key to a successful survey is planning and several months are required to ensure all the various elements are in place before a single driver is interviewed. These surveys have been done by researchers, governments and community groups with an interest in rates of impaired driving in their community.

REFERENCES


