The Road Safety Monitor 2004

Drowsy Driving

TRAFFIC INJURY RESEARCH FOUNDATION

A DRIVING FORCE FOR SAFETY

The Traffic Injury Research Foundation

The mission of the Traffic Injury Research Foundation (TIRF) is to reduce traffic-related deaths and injuries.

TIRF is a national, independent, charitable road safety institute. Since its inception in 1964, TIRF has become internationally recognized for its accomplishments in a wide range of subject areas related to identifying the causes of road crashes and developing programs and policies to address them effectively.

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Drowsy Driving

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Executive Summary

- The Road Safety Monitor is an annual public opinion survey by the Traffic Injury Research Foundation (TIRF) that takes the pulse of the nation on key road safety issues by means of a comprehensive telephone survey of a random, representative sample of Canadian drivers.
- The results from the fourth edition of the Road Safety Monitor have been released in a series of reports that cover several key issues – the present report focuses on drowsy driving.
- 57% of Canadian drivers believe drowsy driving is a serious or very serious problem.
- Over half of them report driving when tired or fatigued, at least occasionally.
- More importantly, one in five Canadian drivers -- an estimated 4.1 million -- said they have nodded off or fallen asleep at least once while driving in the past 12 months.
- Falling asleep at the wheel varies as a function of age – 35% of drivers aged 20-24 reported that they had done so.
- Male drivers are more likely than female drivers to report having nodded off at the wheel.
- Falling asleep at the wheel most commonly occurs late at night and during the afternoon.
- Drivers who report nodding off while driving are also more likely to report getting less than 8 hours sleep per night, to rate the quality of their sleep as “poor”, and to experience greater daytime sleepiness.
- The most commonly reported action to help drivers remain alert was “pulling over to take a break or have a nap”. Other tactics included: open a window; drink coffee; turn the radio on loud; and change drivers.

The Road Safety Monitor

The Road Safety Monitor is an annual public opinion survey developed by the Traffic Injury Research Foundation (TIRF) to take the pulse of the nation on key road safety issues.

The survey examines:

- what Canadians see as priority road safety issues and how concerned they are about them;
- their views about how to deal with these problems;
- how they behave on the highways; and
- what they know and don't know about safe driving practices.

Rationale

Information on public knowledge about road safety issues is valuable for determining the specific areas where awareness needs to be heightened and knowledge improved. Information on public attitudes toward road safety and information about driving habits and safety practices is valuable for guiding program development and policy decisions.

Annual monitoring in these areas permits an assessment of changes in knowledge and awareness as well as changes in safety practices and in the level of concern about persisting problems; it also helps identify new and emerging issues.

Structure

The TIRF Road Safety Monitor is designed to assess public opinion, awareness, knowledge, and practices on a broad range of important traffic safety issues. It includes a core set of questions that are asked each year to provide information on trends in

attitudes, opinions and behaviours. This is supplemented by a set of questions that probe more deeply into special, topical, and emerging issues.

Reports from the 2001, 2002, and 2003 editions of the Road Safety Monitor can be accessed at: www.trafficinjuryresearch.com/publications/publications.cfm. This, the fourth edition of the TIRF Road Safety Monitor, was released in a series of reports: the first (Beirness et al. 2004a) dealt with *Young Drivers;* the second focused on *Drinking and Driving* (Beirness et al. 2004b); and, the present report examines attitudes, perceptions, and practices related to driving while drowsy or fatigued.

Method

This fourth edition of the TIRF Road Safety Monitor contained 102 items designed to probe the knowledge, attitudes, and concerns of Canadians with respect to a range of road safety issues and to obtain information on their driving practices. The survey required an average of approximately 20 minutes to complete.

The survey was administered by telephone to a random sample of Canadian drivers. Opinion Search Inc. conducted the interviews in May, 2004. Among the 5,666 households contacted in which a person was asked to participate, 3,735 (65%) refused, 68 (1.2%) terminated early, and 642 (11.3%) were not qualified.

A total of 1,209 drivers completed the interview. The data were weighted to ensure the results were representative of the national population. Based on a sample of this size, the results can be considered accurate within 2.8%, 19 times out of 20 (most conservative estimate).

Drowsy Driving

Background

Driving is a complex task that requires the coordination of a variety of physical, psychomotor and cognitive skills (Mayhew and Simpson 1995; McKnight and Hundt 1971; Shinar 1978). Safe driving also requires a high degree of attention and concentration. It is well known that anything that distracts or competes with a driver's attention to the task of operating a vehicle can have serious implications for road safety.

For most experienced motorists, however, driving is an overlearned skill that does not always require 100% of their attentional capacity. In fact, many driving situations are very routine -- some are even monotonous and boring -- which can lead to fatigue, drowsiness, and even sleep.

The danger of falling asleep at the wheel is clear. Less apparent and not as well recognized are the hazards associated with fatigue and drowsiness. Fatigue and drowsiness can impair various elements of performance that are essential to the safe operation of a motor vehicle, including slower reaction time, reduced vigilance (delayed responding, longer periods of non-response to stimuli) and deficits in the speed and accuracy with which information is processed (e.g., Dinges,1995).

In the United States, the National Highway Traffic Safety Administration estimates that drowsy driving is responsible for 100,000 crashes, 40,000 injuries, and 1,550 deaths annually (NHTSA 2000). In Canada, fatigue is listed as a causal or contributing factor for over 2,000 drivers involved in fatal or injury crashes.[1] This represents about 1% of all drivers involved in serious collisions. However, given the lack of a simple, readily available means to assess the extent of driver fatigue or drowsiness and the inconsistency in reporting practices within and among jurisdictions, these estimates are

[1] TIRF Injury Database. Excludes Quebec.

generally believed to be conservative. The actual number of crashes attributable to fatigue and/or sleepiness may be much larger but is unknown.

Studies of crashes involving drivers who fell asleep find commonalities among the situations, circumstances, and characteristics of the drivers involved. For example, a detailed investigation of such crashes found that most involved a single vehicle (78%), occurred on roadways with higher speeds (62% over 55 mph) and involved the vehicle leaving the road (79%). Three-quarters of the drivers involved were male and the median age was 23 years. The most common time period for these crashes was in the late night/early morning hours (midnight to 7 a.m.) with a secondary peak occurring in the mid-afternoon. Among drivers up to the age of 45, these crashes are most common at night; among older drivers, the peak time for drowsy driving crashes is mid-afternoon (Pack et al. 1995).

Another recent study compared drivers involved in crashes who had fallen asleep with other drivers who had not fallen asleep but who were involved in a collision. The study identified several risk factors associated with sleep-related crashes, including: holding multiple jobs; working night shift; getting less than 6 hours sleep per night; greater use of sleep medications; and longer duration of driving periods (Stutts et al. 2003). Many of these same factors were identified in a study of long-distance truck drivers who reported having fallen asleep at the wheel (McCartt et al. 2000).

What Causes Drowsy Driving and Fatigued Driving?

Technically, drowsiness and fatigue are distinct and separate concepts although in common usage, the terms are often used interchangeably. Drowsiness, also referred to as sleepiness, refers to the urge to fall sleep. It is the result of a biological need to sleep that can be irresistible. Fatigue refers to the reluctance to continue a task as a result of physical or mental exertion or a prolonged period of performing the same task. Drowsiness and fatigue are often closely related and for most individuals, the distinction between the two is often subtle and of little importance. Both can compromise the ability to operate a vehicle safely.

Drowsiness -- or sleepiness -- increases with the length of time a person has been awake. People who get inadequate sleep or experience poor quality sleep, either as a result of lifestyle (e.g., shift work, late night socializing) or as the consequence of a sleep disorder (e.g., insomnia or sleep apnea syndrome), may experience acute or chronic sleepiness. Sleep loss can increase drowsiness and the risk of crash involvement.

Humans have a natural sleep-wake cycle that follows a daily or circadian pattern. For most people, there are two predicable periods in a day when they are most sleepy -- the most prominent one occurs at night, and a less pronounced one occurs during the afternoon. Driving during these times can increase the risk of crash involvement. Also, people whose schedule is out of sync with this natural cycle (e.g., shift workers) can experience increased sleepiness during their waking hours.

Alcohol and some other medications are known to enhance drowsiness. More importantly, the use of alcohol can exacerbate the performance deficits associated with drowsiness creating a level of risk greater than either factor alone.

Performing a repetitive, uninteresting task over an extended period of time -- such as driving for long periods of time -- can lead to boredom and fatigue. Highway driving for hours at a time, especially during the circadian periods associated with greater sleepiness can lead to fatigue and drowsiness, thereby increasing the risk of crash involvement. In this context, young drivers (who, as a group, are more likely to drive late at night) and truck drivers (who often spend long hours driving) are considered to be particularly susceptible to impairment as a result of driving while drowsy or fatigued.

Purpose of the Report

Road safety experts have only recently recognized the potential significance of drowsy driving as a road safety issue. As we learn more about the problem, it becomes increasingly important to understand the extent of knowledge and concern among Canadians about drowsy driving.

This was a primary purpose of this edition of the Road Safety Monitor, which was designed to assess:

- the level of public concern about drowsy driving;
- the extent of Canadians' experience with drowsy driving and the behaviours associated with it; and,
- what drivers do to combat drowsy driving.

PUBLIC CONCERN

Although not considered the most serious road safety issues, drowsy and fatigued driving are viewed by a majority of Canadian drivers as a serious problem. Figure 1 shows the percent of participants in the Road Safety Monitor who rated a number of road safety issues as serious or extremely serious. As can be seen, drowsy driving is rated as a serious or extremely serious problem by 57% of respondents. This is certainly well below the perceived seriousness of several other road safety issues such as drinking and driving and running red lights but nonetheless regarded as important by well over half of the Canadians surveyed.

Figure 1: Perceived Seriousness of Traffic Safety Issues

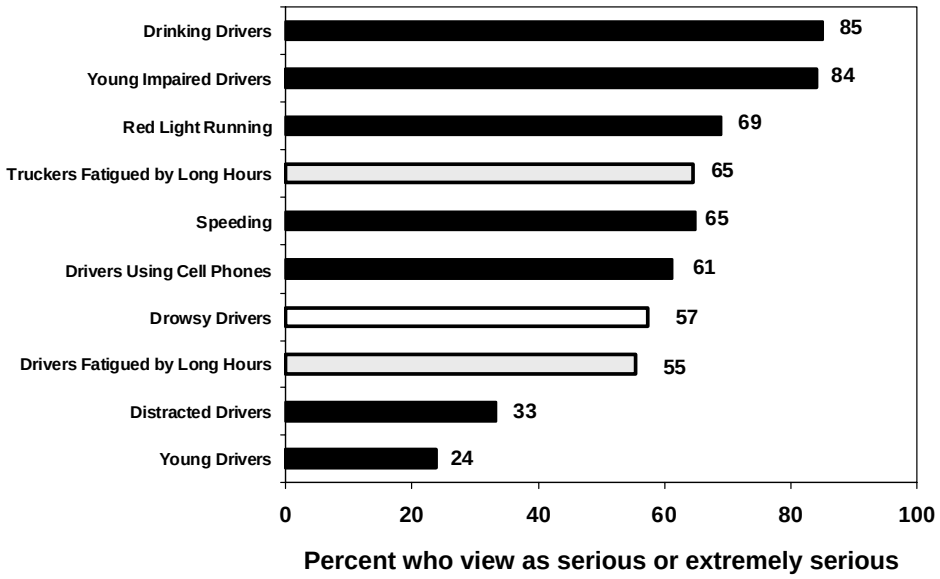


Figure 1 also shows that truck drivers who are fatigued by long hours of driving are perceived to be a more serious problem than other drivers who are fatigued. Whereas 65% of respondents view truckers who are fatigued by long hours of driving as a serious or extremely serious problem, only 55% expressed the same level of concern about

other drivers who are fatigued by long hours of driving. To some extent this apparent discrepancy may be attributable to the perceived amount of time commercial operators spend on the road and the potential for serious consequences should a problem occur with an operator of a large vehicle.

EXPERIENCE WITH DROWSY DRIVING

How many Canadians have fallen asleep while driving?

The potential dangers associated with falling asleep behind the wheel are obvious. Nevertheless, 20% of Canadian drivers surveyed reported that they have "nodded off" or "fallen asleep" at least once in the past twelve months when they were driving. A recent survey of American drivers conducted by the National Sleep Foundation (2002) reported a similar finding.

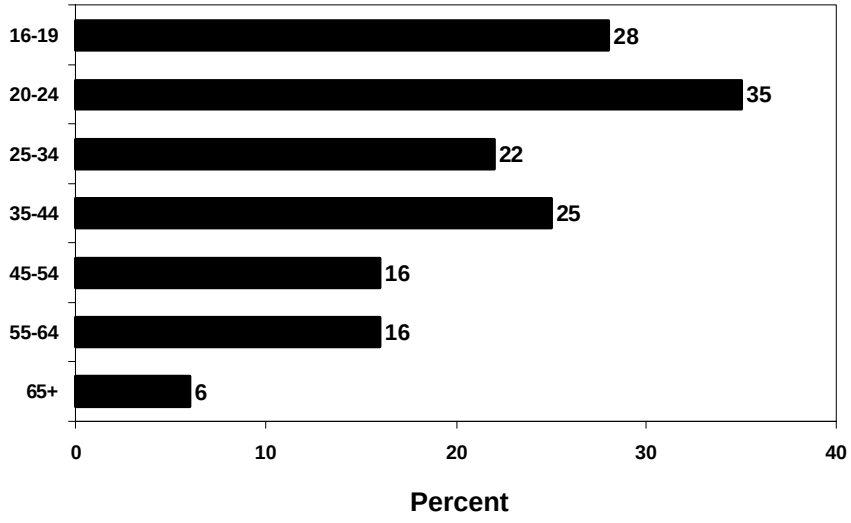
This translates into a problem that is anything but inconsequential. When applied to the entire population of licensed drivers, it indicates that an estimated *4.1 million Canadians have fallen asleep or nodded off at least momentarily while driving within the past twelve months.*

1 in 5 Canadians fell asleep at the wheel in the past 12 months.

Falling asleep at the wheel is more commonly reported by males than females. Whereas 28% of male drivers report having nodded off while driving in the past year, only 13% of females report having done so.

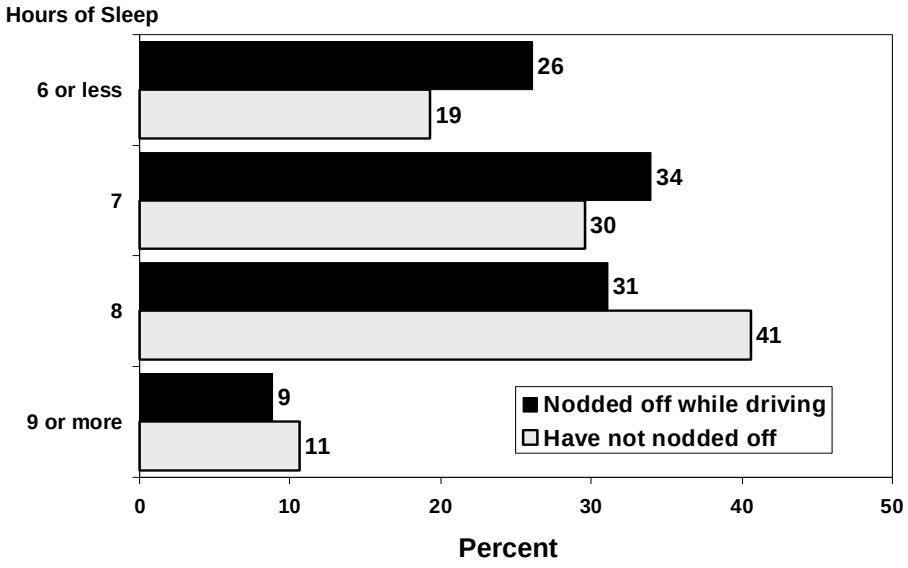
Falling asleep at the wheel also differs as a function of age, as shown in Figure 2. Indeed, over 1/3 (35%) of the drivers between the ages of 20 and 24 report nodding off or falling asleep while driving in the past year. Among drivers aged 16 to 19, 28% reported that they had nodded off or fallen asleep at the wheel. Only 6% of drivers 65 years of age and over report having nodded off or fallen asleep while driving in the past year.

Figure 2: Percent of Drivers who have "Nodded off or fallen asleep while driving" According to Age



The typical amount of sleep a person gets each night can have a profound effect on feelings of tiredness and performance during the day. Figure 3 shows the typical number of hours of sleep reported by drivers who report having fallen asleep at the wheel or nodded off while driving, compared to those who have not done so in the past year. As might be expected, those who have nodded off while driving are more likely than others to report getting 7 or less hours of sleep each night.

Figure 3: Usual Amount of Sleep for Drivers who Have and Have not Nodded off While Driving



Less sleep each night is related to lower ratings of the quality of sleep and more frequent feelings of drowsiness during the day. Not surprisingly, drivers who report having fallen asleep at the wheel or nodded off while driving not only report fewer hours of sleep but are also more likely to rate the quality of their sleep as “poor“ and to report more frequent drowsiness during the day.

Among those who reported falling asleep while driving, the amount of time spent driving when this happened need not have been long. In fact, 44% of respondents indicated they had only been driving for an hour when they nodded off. About 25% said they had been driving for 2 to 3 hours and 30% had been driving for 4 or more hours before they fell asleep.

The most commonly reported time of day for falling asleep at the wheel was in the afternoon (i.e., between noon and 6 p.m.) -- 32% of all respondents who said they had nodded off while driving did so at this time. About one-quarter said they had done so late at night, between midnight and 6 a.m. These two peaks in reported falling asleep at the wheel correspond with the known circadian cycle of sleepiness.

Drowsy driving is most common during the afternoon and after midnight.

The tendency to nod off during the afternoon increased with age. The opposite pattern was apparent for the period after midnight -- younger drivers were more likely to report nodding off during late night hours than older drivers. Interestingly, teenage drivers were also most likely to report nodding off while driving in the morning (i.e., between 6 a.m. and noon).

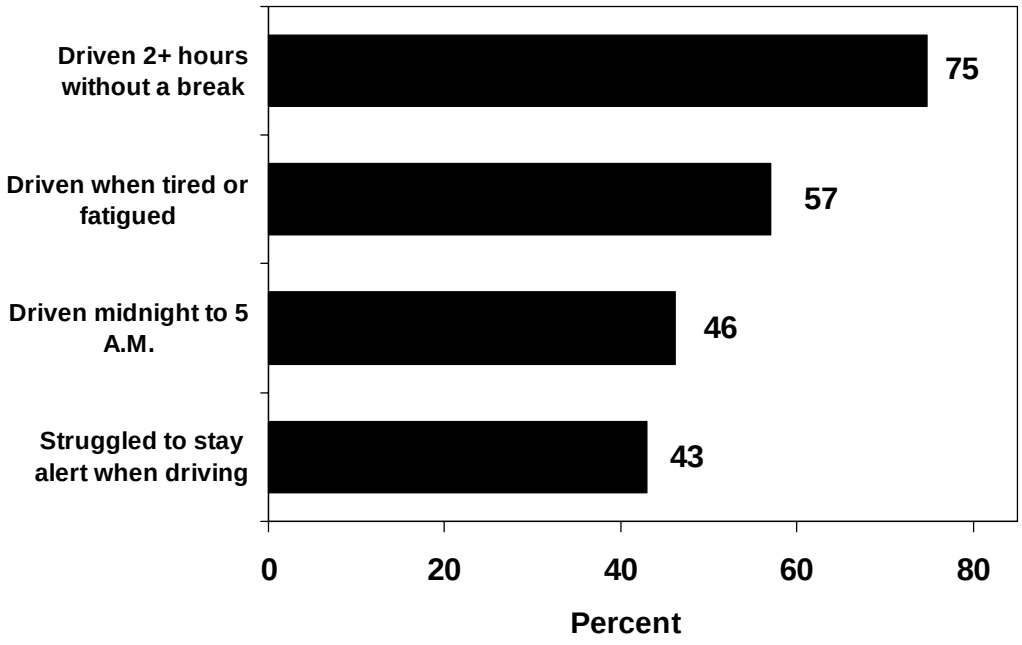
High risk behaviours associated with drowsy driving

Respondents were also asked how often they engaged in behaviours typically associated with drowsy or fatigued driving and the risk of crash involvement. Figure 4 shows the percent of drivers who reported each of four behaviours “at least occasionally” -- driving for more than 2 hours without taking a break, driving when tired or fatigued, driving between midnight and 5 a.m., and struggling to stay alert when driving. Three-quarters of drivers said they have driven for 2 hours or more without taking a break and

over half (57%) reported having driven when they were tired or fatigued. Driving between midnight and 5 a.m. was reported by 46% of respondents and 43% said they at least occasionally struggled to stay alert while driving.[2] Males, and those under 25 years of age were most likely to report these high risk behaviours.

57% report having driven when drowsy in the past year.

Figure 4: Percent Who Report High Risk Behaviours "At Least Occasionally"



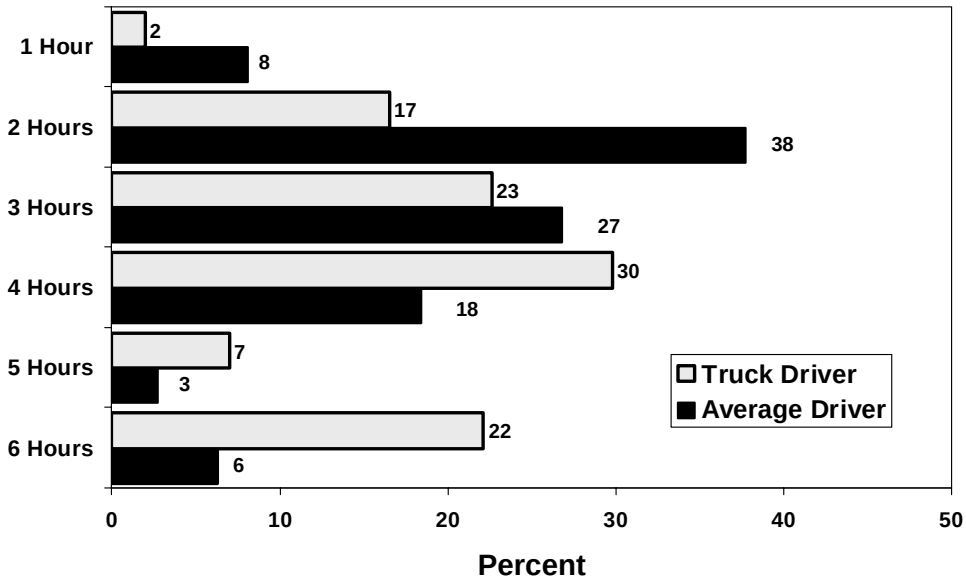
Actions to avoid drowsy driving

Survey respondents were asked to report up to three actions they took to help them remain alert while driving. Among the wide variety of responses, the most frequent response -- reported by almost half of drivers (48%) -- was "pullover to take a break or have a nap". Other common responses were: open a window; drink coffee or other caffeinated beverage; turn on the radio loud(er); change drivers; take a walk; and eat something.

[2] The translation of this latter item could have been misinterpreted. Hence, the percentage reported excludes responses from interviews conducted in French.

Respondents were also asked two questions concerning the maximum number of hours respondents believe a person should drive before taking a break -- one for average drivers and another for truck drivers. The results are shown in Figure 5. Clearly, there is a difference in the perceived length of time truckers could drive before taking a break compared to other drivers. Whereas the most commonly reported maximum period of continuous driving considered appropriate for the average driver was 2 hours (38% of respondents), the highest proportion of respondents (30%) thought truck drivers could drive for a period of 4 hours before taking a break. Almost one-quarter indicated truck drivers could drive for 6 or more hours without taking a break. To some extent, the difference in the perceived period of continuous driving between truckers and other drivers may reflect the public's perception of the skill and experience of truck drivers.

Figure 5: Number of Hours Driving Before Taking a Break



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