

CCMTA

IMPAIRED DRIVING DATA WORKSHOP

PROCEEDINGS

October 2003

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Medical Data: Julian Martalog, Canadian Institute for Health Information

Fatality Database: Dan Mayhew, Traffic Injury Research Foundation

Collision Data: Bill Mercer, University of British Columbia

International Data: Dan Mayhew, Traffic Injury Research Foundation

Police Perspective: Maurice Pilon, Canadian Association for Chiefs of Police

EXECUTIVE SUMMARY

In October 2002 the Canadian Council of Motor Transport Administrators (CCMTA) hosted a one-day workshop on Impaired Driving Data in Ottawa, Ontario. It was organized by the CCMTA in conjunction with other road safety organizations and received sponsorship from Transport Canada and MADD Canada.

In 2001 and 2002, a number of newspaper articles and news releases from several road safety organizations underscored the existence of some confusion regarding the interpretation of impaired driving statistics, which reflects, among other things, the complexity of the impaired driving problem in Canada. Moreover, it is a challenge to relay this complex issue in a simple and straightforward way through public awareness and educational materials.

The objective of the workshop was to examine data collection, methodology, reporting issues and outcome data of impaired driving. A facilitated discussion was initiated following presentation of material on the following six categories: justice statistics, medical data, fatality data, collision data, international data and a police perspective. An additional important aspect of the workshop was to discuss and seek a common understanding of definitions related to impaired driving statistics and their use in public awareness campaigns.

Two background documents were provided to participants prior to the workshop on:

- a) "The Alcohol-Crash Problem in Canada: 1999" produced by the Traffic Injury Research Foundation (TIRF) and,
- b) "The Real Facts on Alcohol Use, Injuries and Death," produced by MADD Canada.

These documents were circulated to participants for their information and to help stimulate discussions on the subject matter.

This report presents the results, key findings and recommendations of the workshop. It identifies opportunities/weaknesses related to the use of fatal, injury and property-damage only (PDO) impaired driving data, enhancements, data linkages and partnerships, and the communication of information on impaired driving by way of public education campaigns. Time did not allow any prioritization of the recommendations at the workshop. The views presented in this report are those of the workshop participants and are not necessarily the views of the CCMTA or sponsoring agencies.

CCMTA and the STRID 2010 Task Force will review the key findings and recommendations to assist in the effort to reduce impaired driving and clearly communicate the results of these efforts to the public and other road safety organizations.

ACKNOWLEDGMENTS

Thanks to our sponsors for contributing to the success of the workshop:

Transport Canada
MADD Canada

Members of the Impaired Driving Data Workshop Steering Committee

Paul Boase - Transport Canada
Borden Graham - Ontario Provincial Police
Dan Mayhew - Traffic Injury Research Foundation
Andrew Murie - MADD Canada
Hal Pruden - Justice Canada
Kwei Quaye - Saskatchewan Government Insurance, Chair STRID
Valerie Todd - CCMTA Secretariat
Lyne Vézina - Société de l'assurance automobile du Québec

1. INTRODUCTION

1.1 Background

The Canadian Council of Motor Transport Administrators (CCMTA) is a non-profit organization established by the provincial, territorial and federal ministries of transportation and acts as the official coordinating body in all matters dealing with the administration, regulation and control of motor vehicle transportation and highway safety in Canada. CCMTA's areas of responsibility include: motor vehicle registration, driver licensing, motor carrier regulatory issues and compliance activities for commercial vehicles and drivers, and road safety programs.

CCMTA carries out its mandate and business through a board of directors and three standing committees. Development work is usually carried out by an array of project groups and task forces appointed by the Board and standing committees to execute certain tasks in their respective fields of expertise. The Standing Committee on Road Safety Research and Policies is responsible for coordination of federal, provincial and territorial road safety efforts, recommendations in support of road safety programs, and development of overall expertise and strategies to prevent road collisions and reduce their consequences. As such, matters concerning impaired driving fall under its responsibility.

Although strategies to reduce impaired driving have been the subject of intense efforts by all levels of government, stakeholders, public interest groups and the police community, impaired driving remains the leading criminal cause of death in Canada. While some progress has been made with respect to the impaired driving issue, it remains a significant social problem in Canada.

In 1990, CCMTA established the Strategy to Reduce Impaired Driving (STRID) to reduce by 20% the percentage of fatalities involving a drinking driver by 1995. The strategy was renewed in 1995, with a revised target of a 20% decrease in the percentage of fatalities and serious injuries by 2001. The STRID 2001 Task Force managed the strategy on an ongoing basis. While there was a significant improvement in the alcohol crash problem by 2001, the reductions fell short of the 20% target. Subsequent to an October 2000 workshop entitled: "*Eliminating Impaired Driving: The Road Ahead,*" the Task Force, together with other stakeholders, renewed and updated its efforts to manage the impaired driving problem. A new STRID 2010 strategy was developed in support of Canada's Road Safety Vision 2010. The Vision 2010 has an overall goal of a 30% reduction in the number of people killed or seriously injured on Canadian roads and STRID 2010 has a new goal of a 40% reduction in the proportion of fatal and serious injuries resulting from drinking drivers by 2010.

In the fall 2002, CCMTA, in conjunction with other road safety organizations and professionals, took responsibility for organizing an Impaired Driving Data Workshop. The purpose of the workshop was to address some confusion regarding the interpretation and use of impaired driving statistics.

1.2 Objectives of Workshop

The challenge for public awareness and education of impaired driving issues lies in the attempt to communicate a complex phenomenon in a simple way. This desire creates room for some degree of confusion.

The principal objective of the workshop was to explore what data types and sources are available on impaired driving, to find out who collects the data, the reason the data is collected and the strengths and weaknesses of each data set. The following aspects of the identified data were then examined:

- strengths
- weaknesses
- linkages
- enhancements
- partnerships
- public communication

In addition, a number of other issues related to the public dissemination of impaired driving information that must be acknowledged and perhaps addressed at future workshops were also explored. These include areas such as:

1. Which vehicle types should be included in assessing and defining impaired driving?
2. What types of road users should be included?
3. Who collects, analyses and reports the data?
4. What are appropriate measures of the impaired driving problem or program effectiveness?
5. What are the key messages that public awareness efforts should focus on, given improvements over the past 20 years and the continuing size of the problem?
6. What is the true economic cost of impaired driving collisions?

1.3 Process

The workshop was attended by some 25 participants from across the country representing areas such as justice, health, research, enforcement, road safety and nationally based community groups. It provided an open forum for discussion and networking. The following key areas pertaining to

impaired driving data were examined: charge and conviction data, medical and trauma data, collision data, the STRID Fatality Database, international comparisons of impaired driving data, and an enforcement perspective on the issue of impaired driving data collection and use.

The program consisted of a number of presentations related to key areas of impaired driving data in the morning, followed by a facilitated group discussion of these issues in the afternoon.

Introduction and welcoming remarks were made by Dr. Kwei Quaye, Chair of the CCMTA Strategy to Reduce Impaired Driving (STRID) 2010 Task Force, which was followed by presentations from the following speakers:

- Justice Statistics: Derek Janhevich, Canadian Centre for Justice Statistics
- Medical Data: Julian Martalog, Canadian Institute for Health Information
- Fatality Database: Dan Mayhew, Traffic Injury Research Foundation
- Collision Data: Bill Mercer, University of British Columbia
- International Data: Dan Mayhew, Traffic Injury Research Foundation
- Police Perspective: Maurice Pilon, Canadian Association for Chiefs of Police

These presentations were followed by a group-facilitated session that was used to generate discussion on the above noted issues to identify strengths, weaknesses and opportunities associated with the use of these data. A summary of these findings is recorded in these proceedings. The actual raw material emanating from the workshop facilitation session is available electronically, but is not included in the proceedings. This information is available on request from the CCMTA Secretariat.

Readers should be aware that the post-workshop summaries are based on the work generated from the facilitated session. The discussion of the data sets and the associated strengths, weaknesses and opportunities represent information from the presentations, which are included in an appendix, and the subsequent group discussion. Some of the comments and recommendations may seem contradictory or vague. What is reported here represents the work of the participants and not necessarily the position of the authors or CCMTA. Participants noted the issues discussed were complex with limited time available for discussion and consequently this material represents the basis for ongoing discussion of these impaired driving issues.

1.4 Program

Workshop on Impaired Driving Data

October 26, 2002

Lord Elgin Hotel

Quebec Room

FINAL PROGRAM

8:30 am Introduction/Welcoming Remarks
Dr. Kwei Quaye, Chair, Strategy to Reduce Impaired Driving 2010 Task Force

Presentation of Discussion Topics

8:45 am - *Justice Statistics*: Derek Janhevich, Canadian Centre for Justice Statistics

9:10 am - *Medical Data*: Julian Martalog, Canadian Institute for Health Information

9:35 am - *Fatality Database*: Dan Mayhew, Traffic Injury Research Foundation

10:00 am Coffee Break

10:15 am - *Collision Data*: Bill Mercer, University of British Columbia

10:40 am - *International Data*: Dan Mayhew, Traffic Injury Research Foundation

11:05 am - *Police Perspective*: Maurice Pilon, Canadian Association of Chiefs of Police

11:30 am Roundtable Discussion

12:00 pm Working Lunch Sponsored by MADD Canada and Transport Canada

13:00 pm Continuation of Roundtable Discussion

15:00 pm Coffee Break

15:15 pm Continuation of Roundtable Discussion

16:15 pm Next Steps/Future Plans

17:00 pm Adjournment

2. DATA ISSUES

2.1 Charge/Conviction Data

Mr. Derek Janhevich representing the Canadian Centre for Justice Statistics (CCJS) gave a presentation on examples of impaired driving criminal justice statistics.

Types of Data

The following types of impaired driving data are analysed and reported by the CCJS:

- Information on *Criminal Code* related incidents only
- Incident-based and charge-based data (accused, victim and incidents)
- Victim rates per incident
- Sentences as a result of *Criminal Code* charges

Sources of Data

- Uniform Crime Reporting (UCR) survey and Incident Based UCR-2 survey

This survey measures and publishes annual data on the nature and incidence of crime and traffic enforcement in Canada. Aggregate data (UCR) on police-reported crime have been collected since 1962 through the UCR Survey. In 1984 development of the micro data Revised UCR Survey (UCR2) began, with the first respondent reporting incident-based data in 1988. The revised survey collects much more detailed offence and accused information and collects victim characteristics in cases of violent offences (and some traffic violations).

As of December 2001, 154 police forces/detachments were providing incident-based crime data, representing approximately 59% of the national volume of crime.

Provincial coverage on UCR2 is currently greatest in Quebec (99%), Ontario (73%), Manitoba (56%), Alberta (53%) and Saskatchewan (52%). National coverage is expected to remain around 60% until such time as the RCMP (28% of national volume of crime) are capable of providing data. (Statistics Canada website, 2003)

- Adult Criminal Court Survey (ACCS)

The objective of the ACCS is to develop and maintain a national adult criminal court database of statistical information on appearances, charges, and cases in adult criminal courts. The survey is intended to be a census of federal statute charges heard in provincial and superior criminal courts in Canada. It includes information on the age and sex of the accused, case decision patterns, sentencing information regarding the length of prison and probation, and amount of fine, as well as case-processing data such as case elapsed time and number of appearances per charge. This data on federal statute charges disposed of in the reference period are collected by the Canadian Centre for Justice Statistics (CCJS) in collaboration with provincial and territorial government departments responsible for adult criminal courts. The data is collected to respond to the needs of the provincial/territorial and federal departments of justice and attorneys-general, researchers and policy analysts, academics and the media, as well as to inform the public on how adults are dealt with by adult provincial/territorial criminal courts in Canada.

Data assessment activities are undertaken by both the provinces/territories and the ACCS to monitor data quality and to provide direction for any modifications where data quality problems are identified. The data is subjected to year-to-year comparisons. Comparisons are made between the survey data and figures contained in the provincial/territorial reports of court operational or case management systems. The results of the data assessment process permit the identification of most types of errors occurring at all stages of data flow.

- Adult Correctional Services Survey (ACS)

The Adult Correctional Services Survey collects the following information on those admitted to custody: sentence disposition/length; age and sex of the offender; ethnicity of the offender (i.e., Aboriginal/Non-Aboriginal), and, offence for which the offender was convicted.

The following strengths and weaknesses were identified for the CCJS's impaired driving data:

Strengths of Data

- The data provides an indication of the magnitude of the incidence of *Criminal Code* impaired driving incidents charges and cases dealt with otherwise.
- Linkage to other data sources allow for an analysis of the incidence of these charges by factors such as:
 - Geography -- provincial, census level analysis
 - Gender and age
 - Temporal analysis
 - Injury severity

-- Other criminal offences

Weaknesses of Data

- The CCJS data does not have any direct linkage to the level of enforcement or enforcement practices (other than contextual information provided by police). It is therefore difficult to attribute any changes in the incidence statistics to changes in the magnitude of the impaired driving problem or changes in the level of enforcement activity.
- The data does not specifically capture drinking and driving charges that arise out of provincial administrative sanctions and therefore does not present a complete picture of charges associated with impaired driving activity.

2.2 Medical Outcome Data

Mr. Julian Martalog representing the Canadian Institute for Health Information (CIHI) provided a presentation on impaired driving data from CIHI trauma registries.

Data Type

Medical outcome data is a critical, but as yet, underutilized data source in the area of impaired driving. These data types are important in accessing physical and mental capabilities of drivers and pedestrians at the time of the collision and in more fully assessing the human consequences and costs related to motor vehicle collisions.

The personal medical data collected by police and reported to the provincial transportation departments is minimal. Injury outcome data, by person, is collected at a minimal level, often differentiating fatal, major, minor and minimal injury of each person involved in the collision. Not all provinces collect these data in the same fashion and using the same definition. Some jurisdictions do not collect even this minimal level of information and the definitions for each level of injury may change across provinces.

When injured persons are transported to hospital, detailed medical data is collected as a part of the medical treatment. Data is collected in emergency and in hospital, as well as by the Coroner/Medical Examiner when death occurs. The Canadian Institute for Health Information manages a National Trauma Registry that is comprised of data from provincial trauma registries and participating trauma facilities.

The National Trauma Registry was developed to facilitate provincial and international data comparisons by utilizing standardized coding methods such as the International Classification of Diseases 9 or 10 (ICD-9 or 10). In addition, the objective is to examine national injury epidemiology to monitor injury as a public health issue and to try to raise the profile in planning, resource allocations and on the public's consciousness. These data are also used to facilitate injury prevention research and assist in the development and evaluation of injury prevention programs.

Data Sources

The data collected by CIHI comes from a number of data collection sources, which impacts the threshold for inclusion in the data set and what level of detail is collected in each data set. This information is reported to CIHI by the hospitals involved, often by a data clerk who is funded in part to collect, check and report the data. These data are usually not collected at the time of treatment but are collected from the patients record at a later date. The data index is related to admissions and discharges (excluding the coroner's data), not an individual or a specific event.

The Minimal Data Set (MDS) has a lower threshold of entry at the national and Ontario level, however, with less specific information collected. This data set includes all acute care hospitalizations due to injury in Canada from 1994/95 and specific to Ontario beginning from 1989/90. The injury selection is based on the External Cause of Injury Code (E-code) and is based on the fiscal year of discharge. Not all provinces report in the same fashion. E-code information includes mode of transport involved, i.e.: motor vehicle, marine vehicle or air as well the person's position such as driver, passenger, pedestrian or cyclist. Other information includes demographic, geographic, length of stay and medical procedures. Alcohol use information is available but its collection is not mandatory.

Some limitations include:

- ❖ an inability to link individuals to a specific event that prevents linking all people in the same vehicle or collision,
- ❖ no specific code to identify impaired driver related events. Only the most severe alcohol abuse situations are identified, and
- ❖ the data index is discharges and thus the system does not count people but events.

This data set includes all acute care hospitalizations in Canada that are based on internationally accepted codes. Future enhancements to ICD-10-CA will elaborate more alcohol involvement information.

The Comprehensive Data Set (CDS) contains injury data on patients hospitalized with a major injury from 1996/97 nationally and 1991/92 in Ontario. The data threshold is an Injury Severity Score (ISS) of greater than 12, which would usually require multiple severe injury modalities. Data is collected from participating provincial trauma registries and trauma facilities and is collected using specialized software called Collector.

Data elements collected include the basic MDS data such as the E-code data, and the blood alcohol concentration (BAC) measured in mmol/L as assessed by blood analysis not breath. Other information available includes clinical assessment scales.

Limitations to the data set include provincial differences in the systematic collection of BAC, some jurisdictions limit the facilities which report, including two provinces with only 1 facility reporting per jurisdiction. Information is based on a discharge not unique persons and the data is unable to link different cases from the same incident.

Strengths are that all major injury discharges are collected with a high level of BAC information (68% at lead trauma hospitals) where the injured person is over 10 years old and the person is admitted within 12 hours of the incident.

Death Data Sets

This component is under development and will report all injury deaths, both at the scene, and subsequently in hospital. Currently, provinces and territories have separate systems using either Medical Examiners or Coroners. These are two different systems, which affect how the data is collected, stored and made available. The initiative to develop a national death data system is a joint effort among CIHI, Statistics Canada and Provincial/Territorial Coroners/Medical Examiners. CIHI will manage the data set. Currently in Ontario there exists a Coroner's Data Set. Alcohol information is limited to those cases where the police report or coroner or medical examiner mentions alcohol as a possible contributing factor. Although BAC levels are not available, alcohol involvement is captured through applicable involvement codes used by the Coroner.

The use of data collected from medical sources for impaired driving research will provide access to some data that the police collected collision data does not provide. Hopefully this type will increase the quality and quantity of information. A number of strengths and weaknesses were identified during the discussions.

Strengths of Medical Data

- The medical definitions using a standardized internationally accepted coding system should increase the reliability and comparability of the data. Data linkage with existing systems, where possible, should enhance available information.
- The impact of drugs and driving, medicinal, illicit and over-the-counter, is a growing concern. The existing system of collecting medical information should also include drug involvement information that could help in research involving this evolving topic.
- Future improvements involving ICD-10-CA and computerizing of the data sets should improve the quality of the data and the technical access to the information.

Weaknesses of Medical Data

- Injury definition and method of data collection can vary across provincial and territorial jurisdictions. How these differences may affect data quality or the resulting conclusions as they relate to impaired driving research is not clear.
- The database is counting discharges rather than people. This can make it difficult to link the data back to other data sources. The lack of a personal identification number connection to data sources such as CIHI records, hospital/coroner records and emergency response records, and the provincial collision data system make it difficult to link the various data bases to maximize the amount and quality of the data. This is compounded by the fact that collision data is reported by calendar year while CIHI data is report by fiscal year, which is not the same in each province/territory.
- A serious consideration relates to data access. Many jurisdictions now have freedom of information legislation that may hinder use of the data by qualified researchers. In addition, there is a national protection of privacy concern and legislation. This problem becomes more of an issue when personal medical information is involved. A related issue of concern is the cost of data retrieval for research projects or annual reports.
- The inability to link multiple patients to a single event or an impaired driver is a significant limitation. The ability to identify multiple persons from one event may be facilitated by linking databases from the medical and police systems.

Summary

Medically collected information is an underutilized, but important type of information for impaired driving research. This data provides a different view of the issue, one with more personal medical outcome information. This could be useful in elaborating the true human or economic impact of impaired driving collisions.

A better understanding of the medical information collected in the different medical data sets and how to link them with other relevant data sets should be a priority for impaired driving researchers. Currently, the only medical data sets used extensively are the death data sets in the provincial and territorial jurisdictions. This information is currently collected on behalf of STRID and stored in the Fatality Data Base administered by TIRF. Better linkage could make this type of data sharing easier, cheaper and more reliable for all injury levels in many different types of collision.

2.3 STRID Fatality Database

Mr. Dan Mayhew representing the Traffic Research Injury Foundation (TIRF) provided an overview of the STRID Fatality Database and estimates of the alcohol-fatal crash problem in Canada.

Data Type

The Traffic Injury Research Foundation (TIRF) has been collecting information on drivers fatally injured in motor vehicle collisions in selected provinces since 1973. Beginning in 1987, data has been collected for all provinces/territories. Since 1990, this data has been collected and reported annually in two reports, the STRID Monitoring report and the Alcohol-Crash Problem in Canada report (formally called "Alcohol Involvement Among Persons Seriously and Fatally Injured in Motor Vehicle Accidents; Canada").

A motor vehicle fatality is defined, for the purpose of the report, as any person dying within 12 months as a result of injuries sustained in a collision involving a motor vehicle. Victims include drivers/riders of varied types of motor vehicles, passengers and pedestrians.

It is important to note that this system is a census data system rather than a sampling system as is used in other jurisdictions. A base level of information is collected on fatally injured persons in motor vehicle collisions and is reported in the annual report.

Data Sources

Data on fatalities is collected in each province and territory under legislation that enables the collection of post mortem specimens (body fluids and tissues) for determining the presence of alcohol and other drugs. Specimens are collected by doctors or pathologists and are tested at laboratories/hospitals. The test results are retained in a coroners' case file in toxicological reports/judgments of inquiry/investigation statements. In some jurisdictions it is necessary to review the coroners' records manually in order to collect the data. This is a slow and time-consuming process that requires a review of the full file. Other jurisdictions provide the data directly to TIRF. In the former case, it is a slow manual process, but there is an element of control over when the data are collected after the close of the end of the year. In the latter case, the data are collected more easily but with no control of when the data is received.

Data elements from the coroners' data files include basic demographics, time of death, type of specimen and chemical test results. The uniform and rigorous testing procedures are conducted on objective, toxicological data concerning alcohol. Although testing rates are not uniform across the country, they are consistently high in each jurisdiction. Reasons for not testing of a sample include no sample available due to fire or excessive loss of blood, blood transfusions or death occurs a long time after the collision.

Data collected from the coroner's files are merged with police collected crash data. Reports are prepared by police officers subsequent to the collision and are forwarded to the responsible agency. These data are transferred either electronically or by hardcopy to TIRF. Data elements include report number, victim demographics and basic crash data, involved person and vehicle information.

Strengths

- The testing rates across the jurisdictions are very high, and the toxicology samples are subjected to standardized tests. This produces uniform test results that can be compared across time or jurisdictions.
- Historical data exists beginning in the 1970s and becoming complete for all provinces and territories in the 1980s. Such a consistent data system allows for historical tracking of changes and trends in the alcohol-fatal crash problem in Canada.
- This data system is a historically valid merging of fatal collision data and medical outcome data.

Weaknesses

- The focus on the alcohol data collected is on fatally injured drivers because few surviving drivers are tested for alcohol. This means that objective alcohol data are not available for collisions in which the driver was not the fatality. This is an issue for multiple vehicle collisions where the alcohol impaired driver was not killed, but there were other fatalities, in the impaired driver's car, or in another vehicle. To address this issue, supplemental information is collected from police reports and coroner/medical examiners files on any evidence that the surviving driver had been drinking or that alcohol was involved in the fatal crash.
- There is also a lack of objective alcohol data on drivers involved in injury-producing and property damage collisions as well as a lower testing rates for drugs other than alcohol.
- There is lack of uniformity in how police report alcohol involvement from jurisdiction to jurisdiction. Also an issue is what types of collisions are reported and how they vary by jurisdiction. This makes comparisons across jurisdictions very difficult.
- There is lack of timeliness in reporting the data after the end of a calendar year. This includes finalizing medical records, entry into the data system and jurisdictions reporting data for the fatality database.
- There is a discrepancy between the number of fatalities reported in the fatality database and the official fatality numbers for some provincial/territorial jurisdictions. This results from a different definition of a fatality. The fatality database includes people killed within 12 months of the collision, while most jurisdictions use the definition recommended by the World Health Organization of 30 days.
- In addition, there are other differences between the fatality database and the official jurisdictional reports. These include vehicle and collision types included in the data system. Such discrepancies are often difficult for non-researchers to understand and explain. Sometimes it may appear that different expert groups are disagreeing or are presenting different data representing the same events. This affects the credibility of the data and confuses the public on this important issue.
- Care needs to be exercised by the reporting agencies to clearly specify the source of the data, what it includes and excludes and how it relates to other representations of similar data.
- The data collection and storage systems make retrieval time consuming and expensive. The static nature of these systems makes them difficult to adapt to changing data needs and emerging issues.

Discussion

The fatality database and the resulting annual reports are valuable documents in terms of the state of impaired driving in Canada and the state of effective countermeasures. However, in many cases the data is incomplete or acts as a surrogate for other important data elements. The data provides valid and reliable estimates over the years in changes in the percentage of fatally injured drivers who had been drinking or were legally impaired. However, estimates regarding the total number of people killed in collisions involving a drinking driver consist of estimates based on positive BAC test results for fatally injured drivers, supplemented by any other evidence of alcohol involvement from coroner reports or police collision reports. The estimates of the actual number of people killed in a collision involving a drinking driver could be improved if the surviving drivers in fatal crashes were routinely tested for the presence of alcohol.

The complexity of this data system fosters confusion in terms of published results and what are actual results, what are estimates and what is included or excluded from various numbers or percentages. As noted above, this confusion reduces the credibility of the data source and may blur the issue.

The data set is primarily used to produce the annual reports and other important public education materials. It is for the most part a fatality database which is produced by linking police collected collision information and coroner/medical examiner data on the presence of alcohol. The database does not link with other medically collected health data. If and/or when such links are possible and routine, the scope of the data will improve dramatically and the richness of available data will be vastly improved.

Drugs are an emerging issue in the area of impaired driving. Drugs add another dimension to the issue of impaired driving. There are many classes of drugs in the illicit, medicinal and over the counter drugs. There are more testing issues than with alcohol. In an attempt to adapt the fatality database, beginning in 2000, drug testing and result data will be included where available. There is a much larger variation by jurisdiction in the level of regular testing for the presence of drugs than is the case with alcohol.

2.4 Collision Data

Under commission by MADD Canada, Dr. Bill Mercer of the University of British Columbia's Applied Research and Evaluation Services (ARES) provided a presentation on police-reported crash data related to issues of quantity and quality.

All jurisdictions in Canada require drivers to report a motor vehicle collision, which exceeds a specified cost threshold, to the authorities on an approved form. In the past, there was an expectation the police would attend the scene of the collision, complete the necessary paperwork and lay the requisite charges. However, as pressure to deliver more by the police with diminishing resources, changes have occurred. In many jurisdictions, police only attend the most serious collisions particularly those involving injuries, criminal charges or disruption to the transportation network. Other options have been developed to address collisions that do not meet the mentioned criteria. They range from no formal collection of these data to collection through other sources such as insurance claims or a self-reporting process. The details of insurance reporting and self-reporting options vary by provincial/territorial jurisdiction. Often the process used is dependent on the type of provincial insurance system and the support of the municipal, provincial or federal police services.

As the severity of a crash increases, so does the level of the police resources necessary to respond. Estimates have a fatal crash using 38 hours of police resources, injury collisions use 4 hours and a property damage crash that is reported requires 1.1 hour. Collisions are complex events that involve differing numbers of people, vehicles, actions and consequences. Forms provided to police in order to collect collision data reflect this complexity and can be frustrating and time consuming, especially for collisions seen as unimportant, such as property damage only. In many jurisdictions, there is a feeling among police that the data is collected for insurance purposes only.

There are two primary types of insurance operating in Canada, public as in British Columbia, Saskatchewan, Manitoba and Quebec, and private. Within both of these types, there are significant similarities and differences across jurisdictions. What data the insurance companies have, how and what they are willing to share and how it is collected varies by type of insurance and the individual company.

Is the missing data, more often in the low value property damage collisions important? What does its absence mean? How many crashes do the authorities miss and what implications does it have on the use of this data for road safety policy development and allocation of resources?

To examine these issues, we need to define what is counted. For a crash to end up in police or transport crash counts the following should happen:

- i) the police must know about it;
- ii) the police must choose to attend it or have the driver report it to the police;
- iii) the police must investigate it and write or submit a formal report form to the responsible government agency; and
- iv) the agency must accept the report, enter the data and report on it.

As noted above, the police have limited resources, drivers may be reluctant to contact the police for fear of charges, and the collecting and reporting crash data may not be a significant priority for police. This is often compounded by competing government responsibilities between the agency responsible for the police, the agency responsible for the highway network and possible insurance considerations.

Given that crash data for injury crashes (especially PDO crashes) is important, and that they are significantly under-reported, there is a need to seek out other sources for this important data, such as crash counts based on vehicle insurance claims counts.

Vehicle insurance claims data is somewhat different from police reported data. Persons involved in a crash typically file insurance claims to obtain compensation for their loss, whether perceived or real. This may result in over inflated estimates of the loss or injury. There may be different data definitions for claims that arise out of a collision and the unit of analysis in insurance data is primarily the claim, not the crash or the driver. The insurance company may be reluctant to divulge data that can be seen as proprietary business data and there may be multiple insurance organizations that could result in a protracted claims settlement process depending on the jurisdiction.

To attempt to address some of the above noted questions, a study was undertaken to compare claims data and collision data in two Crown Insurance Corporations. The first is the Insurance Corporation of British Columbia (ICBC) which utilizes a tort system and the Manitoba Public Insurance (MPI) which utilizes a no fault system.

Evidence suggests there is under-reporting in crash counts by the police which increases as the severity of the crash is reduced. In other words, fatality data is reasonably well reported, injury data has relatively more under-reporting while property-damage-only crashes are significantly under-reported. The seriousness of the collision also impacts the quality of the data collected.

This issue of under-reporting significantly affects estimates of impaired driving crashes. Changes in the degree of under-reporting of impaired driving crashes could be misconstrued as substantive changes in the magnitude of the impaired driving problem.

Other data quality issues include:

- Police training to recognize impairment due to alcohol or drugs;
- Capacity or authorization to investigate under the Criminal Code of Canada;
- Definitions of various data elements;
- Motivation and resources to investigate and report crashes and impaired driving involved crashes; and
- Timeliness and accessibility of data reports.

Conclusions

Police-reported crash data should be used more in a qualitative rather than quantitative manner. The presence of evidence regarding impairment is direct evidence of impairment, but the absence of direct evidence does not mean that impairment was not involved. To better define the size of the problem and describe demographics of the involved persons and the crashes, other data sources should be used. Other possible sources include insurance claims data and medical injury data systems.

The exclusive use of police-reported crash data will likely under-report estimates of impaired driving crashes. This problem is not consistent over time or across jurisdiction, but will likely worsen as official reporting thresholds increase, or police reporting of PDOs decreases even further.

A ratio estimation system is recommended to address the serious issue of under-reporting of impaired driving collisions. This is predicated on the assumption that large representative samples can be used to estimate real-world values. By using stable ratios of crash frequency for relatively known crash types, for example fatalities to relatively less known crash types, such as PDOs. This estimation system can apply to many different crash types which includes impaired driving.

The likelihood of returning to the past where police attend and report on most collisions over a specific threshold is very small. Competing priorities combined with diminishing resources make this impossible. Police services, reflecting the attitudes of the motoring public, view the reporting of low damage property damage collisions as discretionary and less of a priority. Too often, data collected regarding a collision is seen as important to the insurance needs but less important for other reasons. As long as the vehicle owners are compensated for their loss through the insurance process, there will not likely be much motivation to change this situation.

However, this data is very important to properly assess the size of any road safety problem, correctly track changes in the problem and evaluate any countermeasures. As resources become more scarce, the ability to correctly identify the problem, target countermeasures and evaluate these programs becomes that much more important. More resources to collect better data is not likely and consequently, better combining of data and data sources and better modeling of existing and new data becomes ever more important. A more detailed discussion can be found at this web site http://www.madd.ca/library/magnitude_report2k2.pdf.

2.5 Police Perspective

Deputy Commissioner, Field and Traffic Services, Ontario Provincial Police Maurice Pilon representing the Canadian Association of Chiefs of Police (CACCP) provided a police perspective on the reporting of impaired driving collisions by police.

Mr. Pilon observed that the reporting of collisions is always a resource-driven issue for the police. There is therefore a need to explore if there are other agencies that can supplement collision data collected by police.

He identified the following as reasons why police forces are interested in reporting collisions and the identification and charging of impaired drivers:

- Legal reasons
- Road safety issues
- Victims issues
- Violations of the law

Weaknesses

Mr. Pilon noted that police (OPP) data has deficiencies and as a result the data provided to provinces is incomplete. This shortage of data increases as the level of the severity of a collision decreases. Other weaknesses and challenges that he identified regarding police involvement in collision reporting and processing of impaired driving charges are:

- Resource challenges
- Administrative sanctions are not recorded on drivers records
- Lack of adequate equipment
- Time consuming charge process
- Traffic enforcement is viewed as discretionary
- There is the perception that impaired driving enforcement is linked to revenue generation and this has an impact on the type of charges laid and the data that is reported.

2.6 International Comparisons

Mr. Dan Mayhew also presented information on international practices regarding the collection of impaired driving data, with special mention of the US Fatality Analysis Reporting System (FARS).

Types of Data

Mr. Mayhew indicated the primary type of data that is collected for assessing the magnitude of the impaired driving problem internationally is fatal crash data. In some countries this data is supplemented with information on injuries as well. This data is combined with data from driver records to enable a broader analysis of the incidence of the impaired driving problem.

Source of Data

The following data sources were identified in the presentation of the international experience:

- Coroner's data from tests of fatally injured drivers
- Police breath test data
- U.S. Fatality Analysis Reporting System (FARS) data that links data from the following sources:
 - Crash reports
 - Registration files
 - Driver licensing files
 - Highway department data
 - Vital statistics
 - Coroner data
 - Hospital medical data
 - Emergency medical reports

Strengths of Data

- Provides good estimates of fatally injured drivers and their BAC levels.
- High testing level achieved in some countries enhances level of accuracy.
- FARS imputation of missing information from sample data allows the assignment of untested drivers to BAC categories.
- New FARS imputation methodology will build on the above by extending the BAC estimation over a broader range (0.0 to 0.94).
- FARS model improves estimates for both fatally injured and surviving drivers.
- FARS provides estimates for driver and crash characteristics such as age, gender, time of day etc.

Weaknesses of Data

- Definition of fatality differs within and across countries.
- Coroner testing rates for fatally injured drivers vary.
- Coroner testing of fatally injured drivers is not systematic.
- Testing for BAC levels is less common among surviving drivers.
- About 60% of BAC values are missing/unknown in the FARS samples. This puts a lot of reliance on the statistical imputation of unknown BACs.

3. COMMUNICATION ISSUES

While participants agreed the workshop was a worthwhile endeavor to provide them with a unique opportunity to discuss and assess the problems related to impaired driving data, one important issue identified was how differing mandates of road safety organizations can affect the reporting of data. The participants agreed the statistics reported by different organizations tend to reflect the scope of their mandates with respect to the impaired driving problem. In order to reduce the confusion that may arise because of the reporting of different statistics, participants agreed an effort should be made to accurately qualify future data reported in public awareness campaigns and to the news media.

4. RECOMMENDATIONS

The workshop concluded with a general discussion of areas of opportunity that would assist in the collection and improvement of impaired driving data. The following areas of opportunity were identified:

4.1 Death/Fatality Data

- Need to explore ways in which we can get better data on the BACs of surviving drivers.

4.2 Injury Data

- Focus on serious injury data for a start.
- Definition of serious injury is an issue.
- Use medical outcome definitions as a starting point for developing new definition of serious injury.
- Linkage to medical outcome data will be explored. This could allow the determination of BACs of seriously injured drivers.
- An opportunity to “team-up” and pool resources with trauma injury registries to improve the quality of this data was discussed.

4.3 PDO Data

- Refine methodology to impute the missing alcohol related PDO's.
- Follow Bill Mercer's work on the estimation of PDO collisions using claims data as a basis.

4.4 Charge/Conviction Data

- Supplement this information with charges from provincial statutes.
- Explore ways in which enforcement levels can be determined. This can be used to supplement the charge data in order to get a better understanding of the incidence of impaired driving.

5. NEXT STEPS

This report presents the results, key findings and recommendations of the workshop. It identifies opportunities/weaknesses related to the use of fatal, injury and property-damage only (PDO) impaired driving data, enhancements, data linkages and partnerships, and the communicating of information on impaired driving by way of public education campaigns. Time did not allow any prioritization of the recommendations at the workshop.

CCMTA and the STRID 2010 Task Force intend to take the leadership role in working with interested stakeholders to translate these recommendations into action. The following are some of the key activities that will be undertaken:

- STRID will review issues related to data on surviving drivers and will consider methods for incorporating data on surviving drivers as part of the overall STRID monitoring. If warranted, this review will involve the establishment of targets and the monitoring of the progress of this new indicator. The 2005/06 review of CCMTA's Road Safety Vision 2010 is the target for new strategies for surviving drivers.
- A task group consisting initially of members from CCMTA, Transport Canada's Data Task Force and representatives from CIHI will be created to assess the work and resources that are needed to come up with an objective and operational definition of levels of injury and to explore the practicality, opportunities and challenges for linking medical outcome data to police reported data.
- CCMTA's Standing Committee on Road Safety Research and Policies (RSRP) will be asked to undertake a review of research on the issue of quantifying the level of enforcement. The aim of this work is to develop a full understanding of the practicality of measuring this phenomenon and the possibility of combining it with charge/conviction data from CCJS and the jurisdictions.

STRID will continue to take responsibility and ownership of the data as reported in the annual Alcohol-Crash Problem in Canada and the STRID Monitoring reports. STRID will also assume a leadership role in assisting the public or any other interested parties in the interpretation of the information provided in these reports.

The timing of these activities will be determined by each of the task groups as part of their workplans. These workplans will be shared with all the workshop participants.

APPENDIX ONE

List of Participants

LIST OF PARTICIPANTS

Doug Beirness..... Traffic Injury Research Foundation
Paul Boase..... Transport Canada
Rosalinda Fischer..... CAA National Office
Brian Hodgson..... Canadian Society of Forensic Science Alcohol Testing Committee
Derek Janhevich..... Statistics Canada
Brian Jonah..... Transport Canada
André Lemaire..... Royal Canadian Mounted Police
Raynald Marchand..... Canada Safety Council
Julian Martalog..... Canadian Institute for Health Information
Dan Mayhew..... Traffic Injury Research Foundation
Bill McCauley..... Transport Canada
Bill Mercer..... University of British Columbia
Andrew Murie..... MADD Canada
Harlie Outhwaite..... Health Canada
Maurice Pilon..... Ontario Provincial Police
Hal Pruden..... Department of Justice Canada
Kwei Quaye..... SGI
Stéphane Racine..... Health Canada
Herb Simpson..... Traffic Injury Research Foundation
Leo Tasca..... Ontario Ministry of Transportation
Emile Therien..... Canada Safety Council
Valerie Todd..... Canadian Council of Motor Transport Administrators
John Turner..... Statistics Canada
Lyne Vézina..... Société de l'assurance automobile du Québec
Greg Yost..... Justice Canada

APPENDIX TWO

Presentations



Impaired Driving: Examples of Criminal Justice Statistics

Presented to: Canadian Council of Motor Transport Administrators

Canadian Centre for Justice Statistics

October 26, 2002



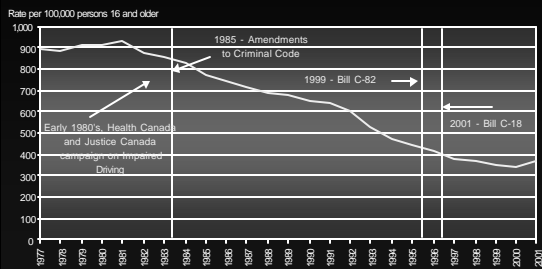
Sources of Criminal Justice Statistics

- ◆ Uniform Crime Reporting (UCR) Survey
- ◆ Incident Based UCR2 Survey
- ◆ Adult Criminal Court Survey (ACCS)
- ◆ Adult Correctional Services Survey (ACS)



First increase in nearly 20 years

Rate of police-reported incidents of impaired driving, 1977-2001

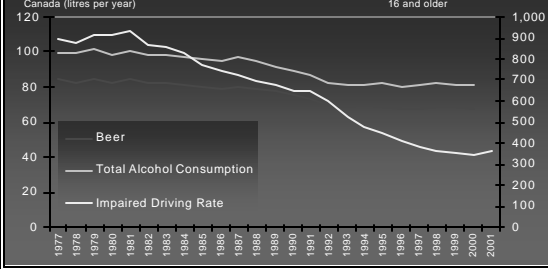


Source: Uniform Crime Reporting Survey, CCJS, 2001



Alcohol consumption and impaired driving rate, 1977-2000

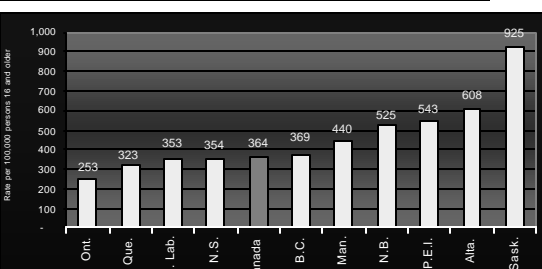
Apparent per capita alcohol consumption, Canada (litres per year) and Rate per 100,000 population 16 and older



Source: Uniform Crime Reporting Survey, CCJS, 2001



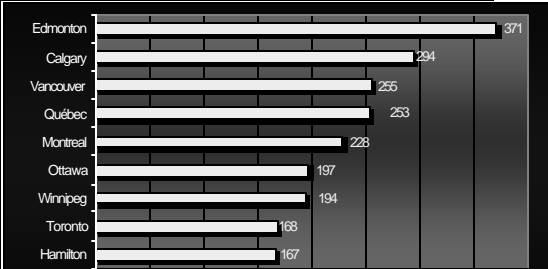
Police-reported impaired driving rates by province, 2001



Source: Uniform Crime Reporting Survey, 2001, CCJS.



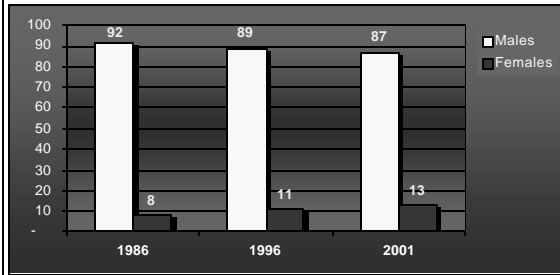
Impaired driving by Canada's nine largest Census Metropolitan Areas, 2001



Source: Uniform Crime Reporting Survey, 2001, CCJS.



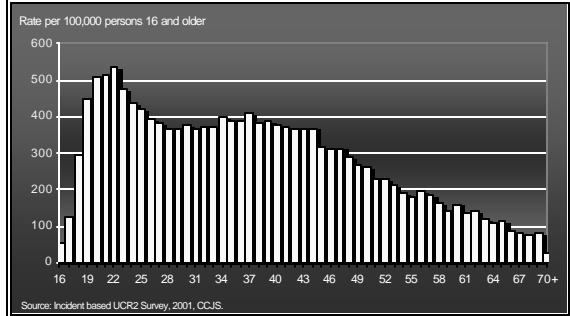
Percent of males and females charged, 1986 - 1996 - 2001



Source: Uniform Crime Reporting Survey, CCJS, 2001



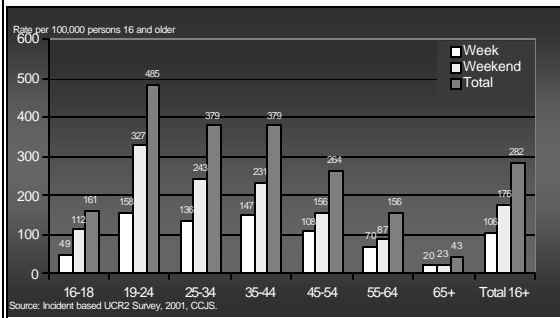
Highest rates among young adults, 2001



Source: Incident based UCR2 Survey, 2001, CCJS.



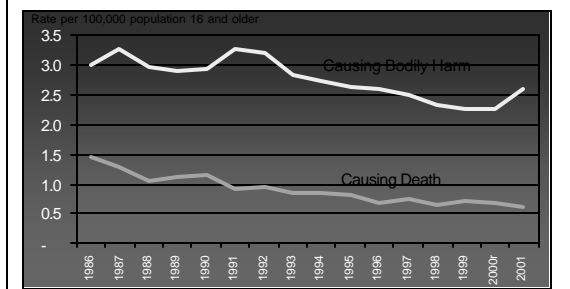
Week and weekend rates by age group, 2001



Source: Incident based UCR2 Survey, 2001, CCJS.



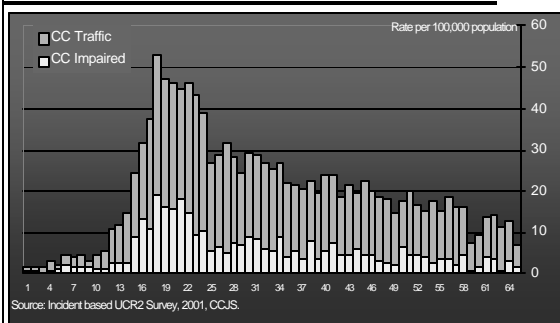
Rate of police-reported impaired driving incidents death and causing bodily harm, 1986 - 2001



Source: Uniform Crime Reporting Survey, CCJS, 2001



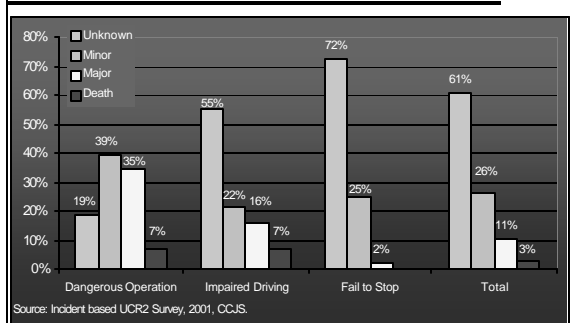
Highest victim rates among young adults, 2001



Source: Incident based UCR2 Survey, 2001, CCJS.



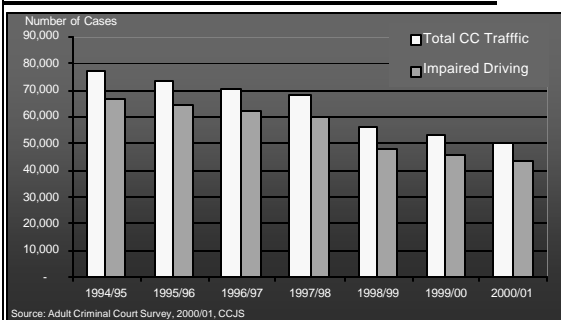
Level of injury - Criminal Code Traffic Offences



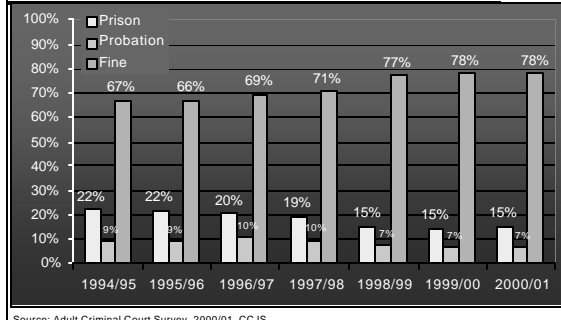
Source: Incident based UCR2 Survey, 2001, CCJS.



Court cases also decreasing - 1994/95 to 2000/01



Impaired driving by most serious sentence, 1994/95 to 2000/01



Adult Correctional Services Survey (ACS)

- ◆ In 1999/00, the proportion of sentenced admissions to provincial facilities for impaired driving ranged from 14% in Saskatchewan to 4% British Columbia and Prince Edward Island.
- ◆ In 1999/00, the proportion of admissions to probation ranged from a high of 9% in Saskatchewan to a low of 4% in New Brunswick, Quebec and British Columbia.



Other Statistics Canada Data Sources

- ◆ Vehicle Survey
- ◆ General Social Survey
- ◆ Canadian Community Health Survey
- ◆ Morbidity data base
- ◆ Causes of death



DISCUSSION

Impaired Driving Statistics from CIHI Trauma Registries

Presentation to "Workshop on
Impaired Driving Data"

October 26, 2002

Presented by Julian Martalog
Consultant, Trauma Registries, CIHI



Presentation Overview

- Trauma Registry Data Sets
- Data Set Strengths & Limitations
- Trauma Registry Products and Services
- Selected Analyses



National Trauma Registry

- Canadian databases managed by CIHI which collects and analyzes hospitalizations resulting from injury. Data are collected from provincial trauma registries and participating trauma facilities.



NTR Goals and Objectives

- To examine national injury epidemiology
- To facilitate provincial and international injury comparisons
- To increase awareness of injury as public health issue in Canada
- To assist injury prevention programs
- To facilitate injury research



Ontario Trauma Registry

- Provincial databases managed by CIHI which collects and analyzes hospitalizations and deaths resulting from injury in Ontario.



OTR Goals and Objectives

- To identify, describe and quantify trauma in Ontario.
- To assist injury prevention programs.
- To facilitate injury research.



Trauma Registry Data Sets

- Minimal Data Sets (national and Ontario)
- Comprehensive Data Sets (national and Ontario)
- Death Data sets (Ontario only, national under development)



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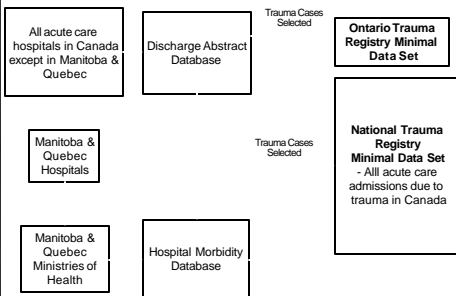
Minimal Data Sets (MDS)

- Includes all acute care hospitalizations due to injury in Canada (from 1994/1995) and Ontario (from 1989/1990)
- Selection of injury cases based on External Cause of Injury Codes (E codes) within ICD-9 coding system
- ICD-10-CA reporting in the future
- Based on fiscal year of discharge



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MDS Data Flow



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Impaired Driving -Related Elements in MDS

- E-codes:
 - type of incident: motor vehicle collisions, water transport, air and space transport
 - also specifies whether injured person was driver, passenger, pedestrian, or pedal cyclist
- Alcohol-related diagnosis codes:
 - 303.0 Acute alcoholic intoxication (in alcoholism)
 - 305.0 Alcohol abuse (nondependent)
- Other elements available: demographic, geographic, hospital-related e.g. LOS, medical procedures



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MDS Limitations

- Limitations:
 - no single code specific to impaired driving
 - captured only if acute alcoholism is considered a comorbid factor, thus only very severe cases captured
 - number of discharges, not unique persons
 - cannot determine if several cases were related, i.e. persons injured from same impaired driver



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MDS Strengths

- Strengths:
 - all acute care hospitalizations
 - based on international coding system
 - standardized coding procedures (CIHI trained)
 - in future, will contain more detailed alcohol involvement information, based on new ICD-10-CA* coding

* Canadian modification of International Statistical Classification of Diseases & Related Health Problems, version 10



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ICD-10-CA Alcohol Involvement Supplementary Codes

Y90 Evidence of alcohol involvement determined by blood alcohol level

- Y90.0 Blood alcohol level of less than 20 mg/100 ml
- Y90.1 Blood alcohol level of 20-39 mg/100 ml
- Y90.2 Blood alcohol level of 40-59 mg/100 ml
- Y90.3 Blood alcohol level of 60-79 mg/100 ml
- Y90.4 Blood alcohol level of 80-99 mg/100 ml
- Y90.5 Blood alcohol level of 100- 119 mg/100 ml
- Y90.6 Blood alcohol level of 120- 199 mg/100 ml
- Y90.7 Blood alcohol level of 200- 239 mg/100 ml
- Y90.8 Blood alcohol level of 240 mg/100 ml or more
- Y90.9 Presence of alcohol in blood, level not specified

ICD-10-CA Alcohol Codes (cont'd)

Y91 Evidence of alcohol involvement determined by level of intoxication

- Excludes: evidence of alcohol involvement determined by blood alcohol content (Y90.-)
- Y91.0 Mild alcohol intoxication
 - Smell of alcohol on breath, slight behavioural disturbance in functions and responses, or slight difficulty in coordination.
- Y91.1 Moderate alcohol intoxication
 - Smell of alcohol on breath, moderate behavioural disturbance in functions and responses, or moderate difficulty in coordination.
- Y91.2 Severe alcohol intoxication
 - Severe disturbance in functions and responses, severe difficulty in coordination, or impaired ability to cooperate.
- Y91.3 Very severe alcohol intoxication
 - Very severe disturbance in functions and responses, very severe difficulty in coordination, or loss of ability to cooperate.
- Y91.9 Alcohol involvement, not otherwise specified
 - Suspected alcohol involvement NOS

Comprehensive Data Sets (CDS)

- Detailed injury data on patients hospitalized with major injury from 1996/97 (national) and from 1991/92 (Ontario)
- Cases included must have Injury Severity Score (ISS)>12
- Selection of trauma cases based on ICD-9-CM
- Participating provincial trauma registries and trauma facilities
- Most data collected via specialized trauma software Collector

CDS Data Flow

11 Lead Trauma Hospitals in Ontario

Ontario Trauma Registry Comprehensive Data Set

Provincial Trauma Registries
British Columbia, Alberta, Quebec, Nova Scotia

Participating Facilities
Manitoba (1)
New Brunswick (1)

National Trauma Registry Comprehensive Data Set
- Major injury admissions in participating facilities

Impaired Driving -Related Elements in CDS

- E-codes: Same E code information available in MDS
- BAC: Blood alcohol concentration measured in mmol/L
- Other elements available: demographic, mode of transport to hospital, clinical assessment scales (e.g. Glasgow Coma Scale)

CDS Strengths

OTR CDS

- captures all major injury in province
- high BAC recording (68% at lead trauma hospital)
- Trauma Registry Advisory Committee recommends routine collection of BAC for >10 years of age and if admitted within 12 hours of incident

CDS Limitations

NTR CDS:

- Differences in systematic collection of BAC across provinces
- Info from Manitoba and New Brunswick from one facility only

OTR CDS and NTR CDS:

- Number of discharges, not unique persons
- Cannot determine if several cases were related, i.e. persons injured from same impaired driver



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Death Data Sets

- National data set under development
 - Will report on all injury deaths regardless if hospitalized or not
 - Joint initiative of CIHI, Statistics Canada, and Provincial/Territorial Coroners/Medical Examiners
 - CIHI role to facilitate implementation; funding not yet confirmed



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Death Data Sets

- OTR Death Data Set (DDS)
 - all injury deaths in Ontario
 - data from Office of Chief Coroner
 - includes factors involved in death (e.g. alcohol, drug involvement)



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DDS Strengths & Limitations

Strengths:

- All injury deaths regardless of hospitalization

Limitations:

- Alcohol involvement coded for cases that have any non-zero BAC recorded on reports (police, Coroner's, or toxicology), also if there is any mention of alcohol on Coroner's report
- Exact BAC available by abstraction (not currently done by CIHI). Ont. Ministry of Transportation does this.



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OTR Products and Services

- Reports
 - Hospital Injury Admissions in Ontario (1999/2000)
 - Major Injury in Ontario (2000/2001)
 - Injury Deaths in Ontario (1999/2000*)
- Special Topic Analytical Bulletins, four per year (e.g. cost, burns, sports)
- Ad hoc requests- aggregate/record-level

* December 2002 release



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Selected Analyses



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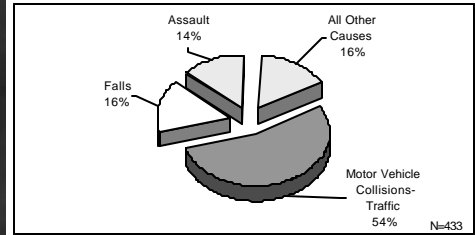
BAC Recording for MVC Major Injury Cases, by Province, 1999/2000

	AB	MB	ON	NS	All
No. of MVC injury cases	683	130	1684	115	2612
No. of MVC drivers age 16+	355	67	927	68	1417
BAC missing	210 (59%)	67 (100%)	218 (24%)	42 (62%)	537 (38%)
BAC documented	145 (41%)	0	709 (76%)	26 (38%)	880 (62%)

Source: NTR CDS

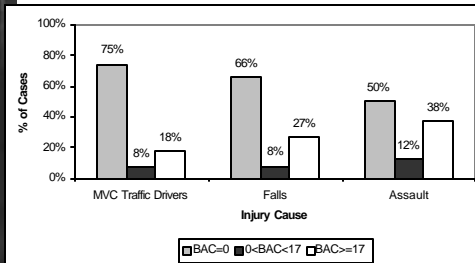
Note: E code info not available for BC in 1999/2000

Leading Causes of Alcohol-Related Major Injury (BAC>0), Ontario, 2000/2001



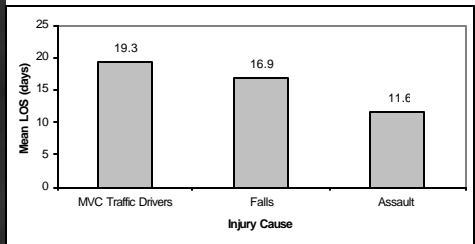
Source: OTR CDS

Cause of Major Injury by BAC Level, Ontario, 2000/2001



Source: OTR CDS

Mean Hospital LOS by Cause of Injury, Alcohol-Related Only (BAC>0), Ontario, 2000/2001



Source: OTR CDS

Injury Deaths in Ontario with Alcohol Involvement

- In 1998/99, there were 192 injury deaths in Ontario in which alcohol involvement in a driver was a factor.
 - includes drivers themselves killed as well as cyclists and pedestrians killed by impaired driving.
- 88% of these deaths were motor vehicle collisions

* identified using Coroner codes alcohol involvement, driver (815) and alcohol involvement, other driver (830)

Source: OTR DDS

Questions?



Impaired Driving Statistics from CIHI Trauma Registries

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October 26, 2002

Presented by Julian Martalog
Consultant, Trauma Registries, CIHI

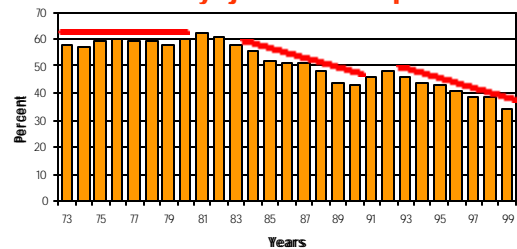


FATALITY DATABASE

- Annual data on persons fatally injured in motor vehicle crashes – victim (case) files
- Historically intact from 1973 to 2001 for seven provinces
- Beginning in 1987, data available from all jurisdictions

NATIONAL ESTIMATE(S)

Percent of fatally injured drivers with positive BACs



OVERVIEW

FATALITY DATABASE

➤ Transport Canada and CCMTA

Indicators

➤ National estimates of alcohol involvement

Strengths and Limitations

CRASH SEVERITY

- Property Damage 75%
- Injury 24%
- Fatal <1%

Objective data available on BACs of fatally injured drivers

FATALITY DATABASE

- Annual data on persons fatally injured in motor vehicle crashes – victim (case) files
- Historically intact from 1973 to 2001 for seven provinces
- Beginning in 1987, data available from all jurisdictions

MILESTONES

- Began in early 1960s and 1970s as a series of small studies
- From 1973 to 1975, two national surveys:
 - All chief coroners (or their equivalent)
 - Laboratories that analyzed post mortem specimens for alcohol and other drugs

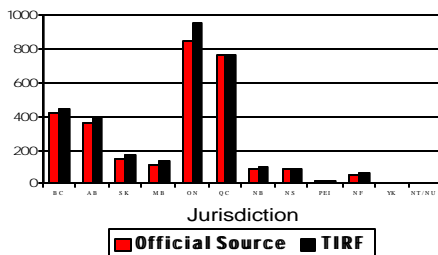
MILESTONES [cont.]

- 1976 major investigation of alcohol involvement in fatal crashes
 - Obtained historical data on victims in seven provinces
- By 1978, process of up-dating annual provincial files (7) had become routine
- By 1997, all jurisdictions participated

DEFINITIONS

- Motor vehicle fatality
 - Any person dying within 12 months as a result of injuries sustained in a collision involving a motor vehicle
 - Includes crashes occurring on and off public roads
- Type of victim
 - Drivers/riders all types of vehicles
 - Passengers
 - Pedestrians

Official Sources and in Database: 2000



DATA SOURCES

- Coroner/medical examiners data
- Police crash report data

STRICT Confidentiality

CORONER: DATA COLLECTION

- Legislation enables collection of body fluids/tissues
- Coroners order the collection of specimens
- Specimens collected by pathologists; testing at laboratories/hospitals
- Test results retained in coroners' case files in toxicological reports/judgments of inquiry/investigation statements

CORONER: DATA COLLECTION

- For most jurisdictions, TIRF staff access files in coroners' offices
- For some jurisdictions, needed data provided to TIRF

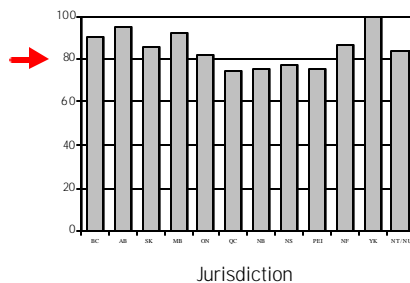
DATA ELEMENTS

- Victim name (link)
- Victim age and gender
- Time of death
- Type of specimen
- Chemical test results

CORONER DATA: STRENGTHS

- Objective, toxicological data on alcohol
- Results of chemical tests, performed on body fluid samples
- Uniform and rigorous testing procedures
- High testing rates

**Percent of Fatally Injured Drivers
Tested for Alcohol: Canada, 2000**



Reasons for not testing

- Victim survived the crash and died much later
- Extensive transfusions prior to death
- Body fluids not available for testing – e.g., victim incinerated in fire; excessive loss of blood

POLICE CRASH DATA

- **Reports prepared by investigating police officers who attend the crash scene**
- **Data obtained in electronic form from responsible agency**
- **For some jurisdictions, needed data coded directly by TIRF staff from standard, “hard copy” reports**

DATA ELEMENTS

- Report number (link)
- Victim name (link)
- Victim age and gender
- Position in vehicle
- Crash date, time
- Type of collision
- Type of vehicle

INDICATORS

(ESTIMATES)

Number and percent of **tested** fatally injured drivers:

- who had been drinking (positive BAC) or
- were legally impaired (over 80 mg%)

STRENGTHS

- Highly valid and reliable measure because almost all drivers who are killed in crashes are tested
- Assumes BAC distribution among untested drivers is the same as tested drivers

ASSUMPTIONS: UNTESTED DRIVERS

- All positive 44%
- All negative 28%
- Same BAC dist. 33%



LIMITATIONS

- Focus only on fatally injured drivers
- Need for a more complete measures of alcohol involvement to meet National objectives under STRID 2001

STRID 2001

- Need for additional indicators, including alcohol involvement in all fatalities and serious injuries
- mid-1990s, Transport Canada funded TIRF to examine approaches for improving national estimates

IMPROVING ESTIMATES

- Fatal crashes
 - **Supplementing available data**
 - Using statistical procedures to assign BAC values (FARS imputation method)
- Serious injury crashes
 - Using police reported data
 - Supplementing police reported data with hospital statistics
 - Applying surrogate measures

POLICE COLLISION

REPORT

☐ DRIVER CONDITION or CONTRIBUTING FACTORS

- Alcohol involvement as a contributing factor
- Apparently normal, had been drinking, impaired by alcohol
- Had been drinking, impaired

POLICE REPORT

FORMS

of Jurs.

- Blood/breath sample taken 1
- Test Results 4
- Charges Laid 11

NEW INDICATORS

- Number and percent of people killed in alcohol-related crashes
 - fatality considered to be alcohol-related if there is at least one drinking driver or drinking pedestrian in the fatal crash
- BAC results supplemented by any other evidence of alcohol involvement from coroner's report or police collision report

STRENGTHS OF THE DATABASE

- Objective
- Uniform/standardized
- Completeness
- Continuity
- Comparability

STRENGTHS (cont.)

- Valid/reliable source of objective, descriptive national/provincial data
- Means for monitoring changes/trends
- Valuable tool for research on alcohol-impaired driving

AREAS FOR IMPROVEMENT

- Data availability
 - Testing rates
 - Fatally injured drivers (coroner)
 - Surviving drivers (police)
- Uniformity
 - Police reported alcohol involvement
- Timeliness
- Scope
 - Beyond fatal crashes
 - Beyond alcohol



**Police-Reported Crash Data:
Some Issues of Quantity and
Quality**

Prepared for the Canadian Council of Motor Transport
Administrators (CCMTA) workshop on Impaired Driving Data,
October 26, 2002, Ottawa, Ontario.

Presented by Bill Mercer Ph.D., Director, Projects, Applied
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ARES web site: www.ares.ubc.ca



Discretionary vs. Non-Discretionary Attendance

Assault = Non-Discretionary

Traffic Incident = Discretionary

Approximate Investigation Times

PDO Crash = 1.1 hours

Injury-only Crash = 4 hours

Fatal Crash = 38 hours

Times from Mercer, G.W. & Taylor, R. (2000) Traffic Policing Parameters. British Columbia
Association of Chiefs of Police Safety Committee Questionnaire Response. For BCAC/By the
Insurance Corporation of British Columbia, North Vancouver, BC.

ARES

BC

ARES

Man.



Quantity

Nobody Really Knows How Many Crashes Occur
**We need to know the general magnitude of the crash
problem in order to create policy and allocate
resources.**

For a crash to end up in police reported crash counts,
the police must know about it, chose to attend,
investigate, write and submit the formal report form to
the appropriate authorities, and the authorities (e.g.
MVB) must gather the report, enter the information,
analyze it, and report upon it.

However,



The police have limited time and resources, drivers may
be reluctant to bring in the police for fear of charges
being laid, and the compilation of complete, timely and
accurate traffic crash statistics may not be of the highest
government priority.

Another source for frequency comparison?

Vehicle Insurance Crash Counts.



Vehicle Insurance Crash Count Issues

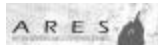
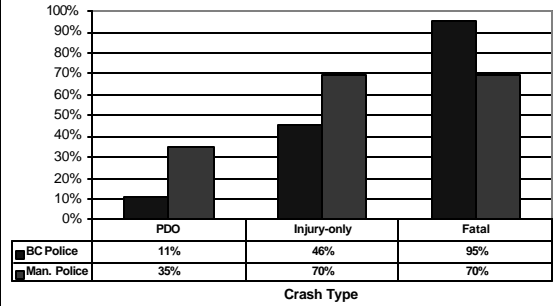
- Drivers report crashes to obtain \$ - injury severity exaggeration.
- Insurance unit of analysis is primarily the claim, not the crash
- Differing data definitions (e.g., "injury").
- Reluctance to divulge information - business implications.
- Multiple insurers in some jurisdictions.

2 Crown Corporation Monopolies:

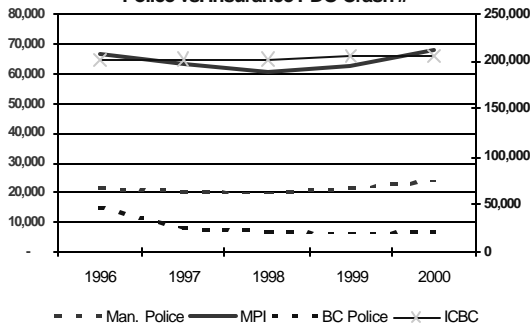
Insurance Corporation of British Columbia (ICBC) - Tort
 Manitoba Public Insurance (MPI) - "no fault"



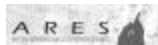
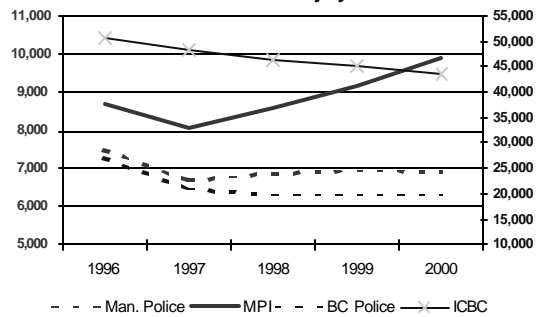
% of Insurance-Known Police-Reported, 2000



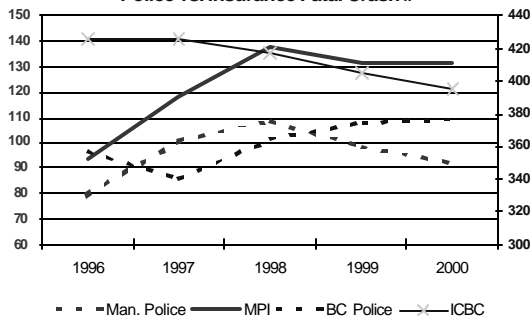
Police vs. Insurance PDO Crash



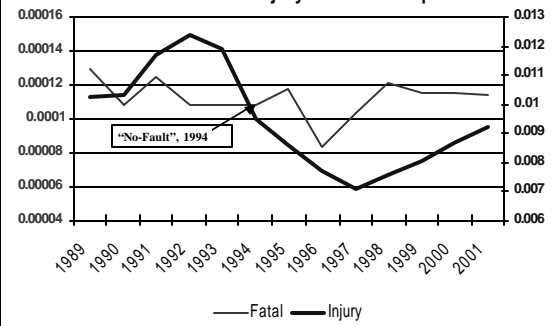
Police vs. Insurance Injury Crash



Police vs. Insurance Fatal Crash



MPI Fatal Crashes & Injury Crashes / Population





Police-reported crash count data

- Under represent actual crash counts
- Are more accurate for more serious crashes
- Vary in accuracy from jurisdiction to jurisdiction



Quality

Nobody Really Knows How Many Impaired Driving Crashes Occur

Reliability & Sampling:

If impaired driving as a crash cause increases as the seriousness of crashes increase

And

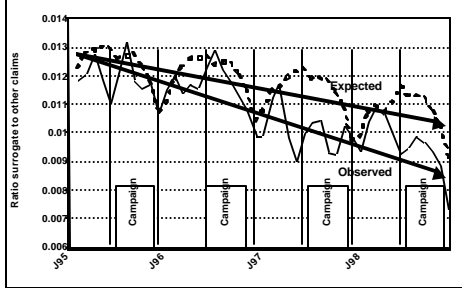
If police attend a variable proportion of crash types from year to year, and jurisdiction to jurisdiction, depending on resources etc.

Then

When they attend & report on fewer crashes, concentrating on the serious crashes, the percentage of police-reported, impaired-related crashes will increase (but the number may decrease), and visa-versa.



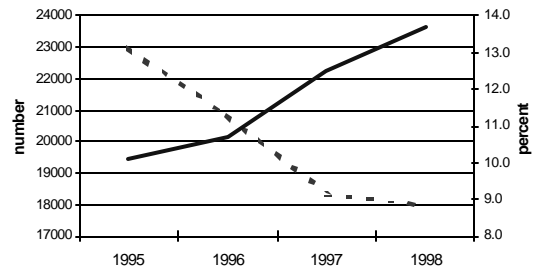
Total Impaired Driving Claims Surrogate, BC, 1995 - 1998



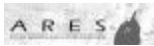
From Fleming, Z. & Mercer, G.W. (2001) *Enhanced Countermeasures: Results of a Province-Wide Impaired Driving Roadblock Campaign, May 14 to December 31, 1998*. Insurance Corporation of British Columbia, North Vancouver BC, January 2001.



British Columbia



-- police-reported injury crashes — TIRF % Alcohol-Involved



Some other Data Quality Issues:

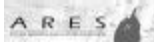
1. Police training to recognize impairment
2. Capacity to investigate under current CCC
3. Definitions – e.g., Crash Severity, Impairment
4. Motivation to investigate & report crashes & impairment
5. Timeliness & accessibility of data & reports



Police-reported crash data should be used more in a qualitative than quantitative manner.

For Confirmation or Triangulation: If impairment is indicated as a crash cause, especially if charges are approved or there is BAC evidence (e.g., coroner, breathalyzer), then the crash was likely impairment-related, **but** no evidence does not make it not impairment-related.

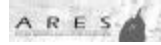
Profiling: To develop profiles using the more objective observations of driver demographics, crash characteristics etc. to be applied to other data sources (e.g., Insurance data crash records) to be used as more epidemiologically accurate surrogate measures of impaired crash frequencies and frequency changes.



Police-reported crash data should NOT be used exclusively or primarily as a measure of the frequency of any any crash-type numbers, and especially not for impaired-related crash numbers or proportions.

We need to develop reliable and valid measures of crash frequencies and crash causes for each provincial jurisdiction, using a range of data sources.

Any significant reliance on police-reported crash frequencies or causes will probably lead to a serious underestimation of the extent of crashes numbers and probably also distort the role impairment plays in those crashes.



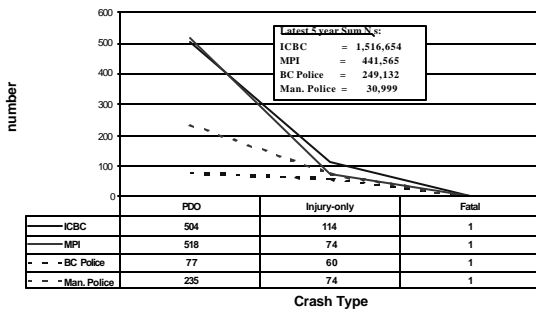
Quo Vadis?

A Statistical Assumption:

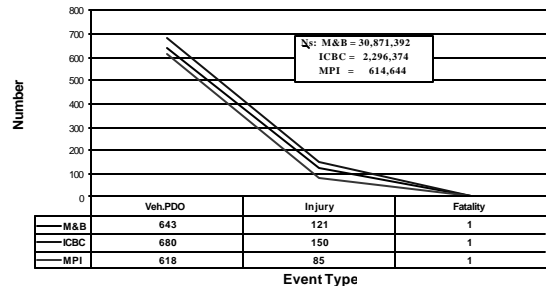
Very Large Representative Samples Can Reveal Stable Relationships Among Variables Which Can be Used to Estimate Real-World Values



Ratio to Fatal Crashes



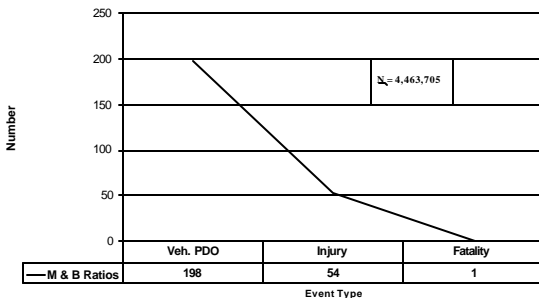
Ratio to Fatalities



M&B = Miller, T.R. and Blincoe, L.J. Incidence and cost of alcohol-involved crashes in the United States. *Accident Analysis and Prevention*, 14(5), 1994.



Ratio to Fatality, BAC > .10%



A Research Direction

To address the issue of accurate crash frequency estimation, jurisdictions should consider establishing ratios to move from from relatively known crash type frequencies to relatively less known crash type frequencies.

Similarly, to address the issue of accurate impairment frequency estimation, jurisdictions should consider establishing ratios to move from from relatively known impairment level frequencies to relatively less known impairment level frequencies.

International Practices: Fatal Crash Databases and Alcohol Estimates

Dan Mayhew
Traffic Injury Research Foundation

OVERVIEW

- Practices outside North America
 - France
 - United Kingdom
 - Australia
- Practices in the United States
 - FARS

PRIMARY FOCUS

- Fatal crashes (injury as well)
 - Definition of fatality differs
 - 8 days (e.g., France)
 - 30 days (e.g., Australia, Austria, Germany)
 - No time limit (e.g., Denmark)
- Data sources
 - Coroner data
 - Police breath test data

ALCOHOL TESTING RATES

- Varies within countries and between countries
- Fatally injured drivers more likely tested than surviving drivers
- No-systematic testing (if alcohol suspected)

ALCOHOL TESTING RATES: FATAL

<u>Country</u>	<u>All Drivers</u>	<u>Dead Drivers</u>
Australia	75%	90%
New Zealand	33%	75%
Denmark	49%	75%
France*	74%	57%
United Kingdom	68%	----
Norway	60%	----
Spain	18%	----
Austria	no systematic testing	----
Germany	only if suspected	----

*alcohol levels known

PRACTICES IN FRANCE

- Alcohol tests are compulsory for crashes involving injury
- When police breath test is positive (over .05, the legal limit) a confirmation is necessary:
 - Breathalyser
 - Blood sample

Drivers in Fatal Crashes

Tested Negative	44%
Blood analysis result	28%
Breath analysis result	2%
Verification result NK	13%
No Test/Verification	<u>13%</u>
	100%

INJURY SEVERITY

- The more seriously the driver is injured, the less often alcohol involvement is known

Proportion of Unknown BACs

slightly injured	19%
seriously injured	12%
dead drivers	43%

FRANCE: ESTIMATES

- Percent of drivers in injury collisions with an alcohol level over the legal limit
- Percent of drivers in fatal collisions with illegal BACs

UK DATA SOURCES

- Coroners' data: level of alcohol in blood of victims aged 16 and over who die within 12 hours of crash
- STATS 19 breath test data: injury crash reporting system – when driver/rider survived and was also breath tested at roadside

POLICE BREATH TEST PRACTICES

- Road Traffic Act (1988) allows the police to test any driver involved in a collision, whether or not anyone is injured
- 1996 ACPO adopted a policy of breath testing all drivers involved in road crashes

ALCOHOL DATA: INCOMPLETE

- Breath test data – only about 50% tested
 - Police do not attend all injury crashes
 - Driver leaves the scene before a test can be taken
 - Too seriously injured to take the test
- Coroner data
 - Death more than 12 hours after the crash
 - No test carried out
 - Some of the data not reported

UK NATIONAL ESTIMATES

- Number of fatal crashes involving illegal BACs
- Number of fatalities involving illegal BACs
- Percent of drivers killed with BAC over the legal limit

AUSTRALIA: CORONER DATA

- Autopsy process routinely includes sampling of blood for laboratory analysis of alcohol content
- Omissions arise from technical/administrative problems

AUSTRALIA: POLICE DATA

- Testing for alcohol among surviving drivers far less common
- In jurisdictions with low levels of testing, obviously impaired drivers tested more often
- Overstate incidence of drink driving

AUSTRALIA ESTIMATES

- Number and percent of fatally injured drivers/riders with a BAC of .05 or greater
- Number of drivers/riders involved in fatal road crashes by BAC

U.S. FARS: DEFINITION

- Fatality Analysis Reporting System (Fatal Accident Reporting System)
 - **Established in 1975**
- annual data on fatal traffic crashes (1982-present)
- Public highways, death within 30 days of crash
- > 100 data elements

FARS DATA SOURCES

- Police crash reports
- State vehicle registration files
- State driver licensing files
- State highway department data
- Vital Statistics/Death Certificates
- Coroner/medical examiner reports
- Hospital Medical Reports
- Emergency Medical Reports

DATA COLLECTION

- Cooperative agreements with each state
- FARS Analysts (state employees) gather, translate and submit state's data in standard format
- Daily updates sent to NHTSA

Rates of Alcohol Testing

Nationwide	1982	2000
Fatally injured drivers	54%	63%
<u>Surviving drivers</u>	<u>16%</u>	<u>25%</u>
All drivers	33%	42%

Varies from state to state

- In 2000, only 15 states tested more than 80% of fatally injured drivers
- Rates are below 50% in 9 states

PROBLEM AND SOLUTION

- About 60% of BAC values are missing/unknown in FARS
- Imputation – method of “filling in” missing data with plausible values

IMPUTATION METHOD

- Linear discriminant model developed in mid-1980s
- Estimates probability driver has a BAC:
 - 0, .01 to .09, or .10 or greater
- Estimates for those for whom alcohol test results not reported

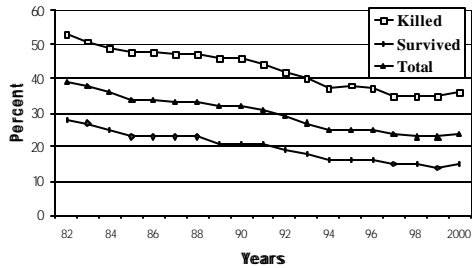
IMPUTATION METHOD

- Examined characteristics of drivers in three BAC groups
 - Person factors: age, sex, licence status, entries on driver record, restraint use
 - Vehicle factors: type and role in crash
 - Crash factors: type (single/multiple vehicle), hour of crash, day of week
- Probability estimates used to classify unknown/untested cases to each of the BAC groups

BENEFITS OF THE MODEL

- Assigns untested drivers to BAC categories
 - Improves estimates for both fatally injured and surviving drivers
 - Provides estimates for a variety of driver/crash characteristics – driver age, gender, time of day
 - Provides BAC distribution at the level of the fatal crash

Alcohol Involvement Among Drivers in Fatal Crashes: US



LIMITATION

- Estimates for only three BAC groups
- No specific BAC values
- No estimate for key groups
 - Drivers with BACs at .08 and above
 - high-BAC drivers – e.g., BACs of .15 and over

MULTIPLE IMPUTATION

- ☐ Beginning with 2001 data year
- ☐ New method to estimate missing BACs
 - **general linear location model**
- ☐ Imputing specific BAC values across the full range of values (0 to 0.94)

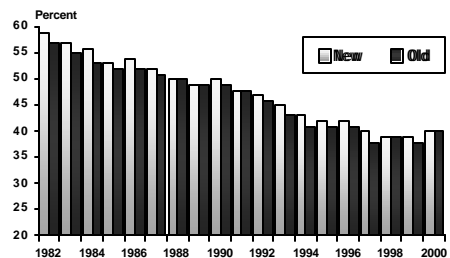
MULTIPLE IMPUTATION

- ☐ Establishes the inter-relationships between the characteristics (variables) of cases with reported BAC values
- ☐ These relationships applied on the same set of variables in the cases where missing values are to be imputed

OLD AND NEW ESTIMATES

- Overall annual estimates and trend of alcohol involvement similar – within 2%
- Minor differences exist in small sub-populations

Alcohol Involvement in Fatal Crashes: BAC .01+

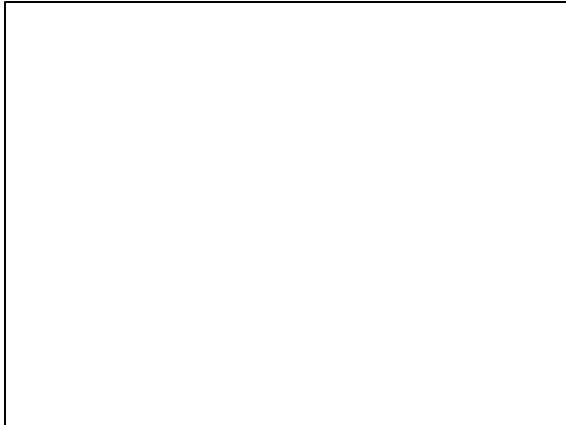


BENEFITS OF NEW MODEL

- Specific BAC values for untested drivers
 - Analytical advantages -- Standard errors, Confidence intervals
 - Policy relevance – support changing legislative needs such as adoption of .08 laws

U.S. NATIONAL ESTIMATES

- Number and percent of fatalities by highest BAC in the crash
 - No alcohol (BAC 0)
 - Low alcohol (BAC .01-.09)
 - High alcohol ($\geq .10$)
 - Any alcohol
- Number and percent of drivers involved in fatal crashes by BAC
 - Same BAC categories as above



Police Perspective - No Presentation Available