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CHARACTERISTICS OF
DRINKING DRIVERS

Alan C. Donelson, Ph.D.
Douglas J. Beirness, Ph.D.
Dan R. Mayhew, M.A.

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PREFACE

The primary aim of this project was "to compile information useful in assessing the appropriateness of sentencing alternatives" for persons convicted of alcohol-impaired driving and related offences. Based on our review of published literature and our analysis of available data, we come to an early (and disappointing) conclusion: present knowledge does not meet requirements for information, either for policy planning or program development. Thus, in preparing this report, we faced a difficult choice.

On the one hand, we had found hundreds of reports worldwide that offered data on different groups of drinking drivers. We could have summarized all these data, produced tables and graphs, and provided descriptive commentary--concluding simply that information to date did not indicate clear directions for policy or programs. On the other hand, we also defined issues underlying the basic question "Who is the drinking driver?". We identified approaches (1) to overcoming limitations of present knowledge and (2) to developing improved action programs designed to reduce drinking-driving problems. These results of the project seemed to us critically important in any report on drinking drivers. We could have devoted major efforts to discussing these issues and their implications for policy and programs, relegating "data" to a secondary role.

Considering the intended scope of the project, our findings, and limitations of time and funding, we chose compromise. We compiled extensive data, produced tables and figures, and summarized findings from studies, emphasizing where possible Canadian work. We also discussed at length important issues and developed for consideration recommendations for future initiatives. Our attempt at compromise, however, will probably disappoint those who seek an exhaustive catalogue of scientific data. This report may also frustrate those who want blueprints for policies and programs. For those readers looking for a middle ground, we hope this report meets their needs.



ACKNOWLEDGEMENT

The Department of Justice, Canada, as part of its broader actions to deal with the problem of alcohol-impaired driving, sponsored the preparation of this report. The cooperation and support of the Department's staff greatly assisted us in the conduct of our work, which produced three other reports relevant to current concerns in this area. We gratefully acknowledge the efforts of Neville Avison and Lothar Goetz, Research and Statistics Section, who collected and provided 1982 data on persons arrested for alcohol-related driving offences in Canadian jurisdictions. Don Piragoff and Lothar Goetz offered useful suggestions and valuable comments for the revising of this and the other reports.

Our project team compiled and analyzed previously unpublished data from the Traffic Injury Research Foundation of Canada; the Department of Justice, Canada; and other sources. Gordon Haas, who manages several data bases at the Foundation, had primary responsibility for generating the statistics used in the tables and figures.

Peter Walsh searched for and obtained many scientific papers cited in this report. We greatly appreciated his assistance--and his persistence--in reviewing those articles and summarizing the information they contained.

Other Foundation staff also made important contributions. Jill Forrest and Wendy Wood produced the text and tables of this report with admirable patience through numerous drafts and revisions. Claire Ryan, Administrative Assistant, supervised the production of the report. Herb Simpson, the Foundation's Executive Director, had responsibility for administrative aspects of the project and contributed his wealth of knowledge and expertise to the overall conduct of the project.

As authors, therefore, we find ourselves but the proverbial tip of an iceberg. We thank all who contributed to this project.



CHARACTERISTICS OF DRINKING DRIVERS
EXECUTIVE SUMMARY

This report summarizes present knowledge of the attributes and characteristics of drinking drivers. It emphasizes where possible the findings of Canadian research. Four questions guided the search for relevant literature and data:

- o Who is the drinking driver?
- o How do various groups of drinking drivers differ?
- o Why is knowledge about drinking drivers relevant to planned and on-going action programs?
- o How can needed information be generated in the process of taking actions to reduce the alcohol-crash problem?

The overall aim of this study was two-fold:

- (1) to present information of general value in developing policy and programs; and
- (2) to identify issues concerning sentencing options for persons convicted of alcohol-related driving offences.

Who is the Drinking Driver? The Present State of Knowledge

The topic characteristics of drinking-drivers--which might appear simple and straightforward--gives rise to issues that complicate the review.

The general population of interest includes all drivers who consume alcoholic beverages at least occasionally (or, conversely, all people who drink and sometimes operate motor vehicles). Within this general population, we can define several target groups for study or action: drinking drivers (those who drive with positive blood alcohol concentrations [BACs]); alcohol-impaired drivers (those who drive with a BAC in excess of the statutory limit [80 mg%] or who become impaired at lower BACs); and accident-involved drinking drivers. This approach to

defining target groups has certain drawbacks that limit its value for countermeasure initiatives.

Popular notions about the "problem drinking driver" ignore human and social dimensions of those convicted of alcohol-impaired driving and related offences. Even the term drinking driver, which implies a durable, personal attribute, fails to capture the dynamic complexity of individual behaviour, embedded in a societal context. In the absence of more definitive knowledge and more informed public opinion, labelling and stereotyping of the drinking driver have taken precedence. In the minds of many, the dark image of the "killer drunk", in spirit if not in fact, applies to all those convicted of alcohol-impaired driving (Section 234(1) or driving with a BAC over 80 mg% (Section 236(1)). This simplistic approach to defining populations of interest for action programs has hindered efforts to identify attributes and characteristics of high-risk subgroups who drive after consuming alcohol. The recent trend toward viewing persons convicted of alcohol-related driving offences solely as "criminals"--without regard to circumstances leading to arrest or to personal problems related to drinking--has tended to decrease concern about differences among offenders. Such differences, however, have great importance in the context of sentencing options and for reducing recidivism.

Knowledge of the characteristics of drinking drivers has value and use in policy planning and program design. The success of policy and the effectiveness of programs depend on accurate, comprehensive information concerning target groups and their responsiveness to various measures and treatment. In the absence of such information, the outcomes of initiatives--whether positive, indifferent, or negative--remain inexplicable, and present knowledge cannot advance. The traditional emphasis on programs without evaluation and research components has contributed greatly to the persistence of this issue.

A basic problem frustrating the growth of knowledge is the artificial dichotomy of research and action programs. Research, which (to many)

connotes "academic" study, does support action programs: (1) by defining the problem; (2) by identifying high-risk groups in operational terms, and (3) by developing appropriate intervention tactics based on the best available information. Nonetheless, "understanding the problem" almost always ranks low in priority compared to "doing something about the problem", even in the absence of adequate data. The separation of research and action programs over two decades has resulted in very little increase in knowledge about drinking drivers. Systematic program planning, along with long-range research, remain hoped-for, but rarely won, objectives.

Thus, the present, limited state of knowledge concerning characteristics of drinking drivers stems from social, legal, and political factors. These factors have overshadowed informational needs as elements of policymaking. Recent (and not so recent) reviews have pointed out the lack of in-depth information on people who drive after drinking. Unfortunately, as subsequent sections in this report indicate, little has changed in Canada to revise this assessment.

People Who Drive After Drinking: Intergroup Comparisons

Research studies indicate that drinking drivers are a very heterogeneous group; many of those who drive and consume alcohol probably combine these activities, at least occasionally. Those who are identified as "drinking drivers" by virtue of some adverse consequence of their behaviour (arrest or accident) represent only a small proportion of the total population. The actual incidence of drinking and driving, as indicated by roadside surveys, far exceeds that evidenced in the apprehended and accident-involved populations.

In comparing different groups of drinking drivers, it is important to remember that descriptions of characteristics are based on static, cross-sectional representations during a brief period of time. In reality, drinking and driving is only a temporary state or condition, which individuals continually enter into and exit from, only to reenter again at some future time. The drinking driver rarely remains in that

state long enough to be identified, let alone measured, analyzed, and profiled. Hence, descriptions of drinking drivers based on static comparisons hide as much as they reveal. This approach cannot capture the dynamic nature of drinking-driving behaviour, nor does it offer much insight into motivations that underlie this behaviour. Descriptions of offenders rarely tell how an individual came to be identified and they can tell nothing of drinking drivers who escape detection.

Comparisons of different populations of drinking drivers do offer some insight into the characteristics of those who have accidents or who are arrested for alcohol-related driving offences. Among main findings summarized in this section are the following:

- o High BACs are highly overrepresented among accident-involved and apprehended drinking drivers compared to those using the road on nighttime weekends.
- o Persons aged 20-34 years appear most frequently in all groups of drinking drivers. Younger drivers aged 16-19 years account for 23% of fatalities, 18% of injuries, 15% of those at risk, and 11% of those arrested for alcohol-impaired driving. Middle-aged drinking drivers are found more often in the at-risk and arrested groups than among those involved in accidents.
- o With respect to gender, males continue to predominate in all groups of drinking drivers, most so among those arrested. The one significant trend in drinking-driving statistics, however, is the increasing proportion of women among those at risk and those fatally injured in road accidents.
- o The interaction of BAC and age factors is complex. On average, younger and older drivers drink less often and lower amounts. Drivers aged 16-19 years, however, are at much higher risk of accident involvement when they do consume alcohol than other drivers. Drivers aged 25-44 years are most likely to have been drinking and most likely to have a BAC over 80 mg%.
- o Concerning marital status of drinking drivers, those separated and divorced may have a higher risk of accident involvement than married and single drivers --a finding suggestive of the influence of emotional states on accident risk.

- o Occupational status and education--variables highly confounded by age and gender--are not strongly associated with accident risk.
- o Present knowledge indicates that a substantial proportion of drinking drivers involved in accidents and of those arrested for alcohol-related driving offences are "problem drinkers" or "alcoholics". Precise estimates are not possible. Nonetheless, the need for effective programs for these groups of drinking drivers is clear.
- o Among those convicted of alcohol-related driving offences are many drivers with poor driving records. A few studies have produced evidence indicating that one high-risk subgroup includes "problem drivers" who also drink. This suggests the need for true driver-improvement programs, beyond licence suspension per se.
- o Accident-involved and apprehended drinking drivers may frequently evidence personality traits and other personal problems that contribute to their dangerous behaviour. Such factors may exacerbate tendencies to drink excessively, to drive recklessly, and to combine the two. These factors represent underlying conditions or "root causes" that have to be addressed in "rehabilitating" offenders.

Information obtained to date fails to provide adequate answers to key questions posed in this report. Nevertheless, given the low probability of arrest and the chance nature of traffic accidents, the available information does tell us a great deal about persons identified as "problem drinking drivers". This information is particularly relevant when compared with drinking drivers from roadside surveys who represent a group that was not identified through adverse consequences resulting from their behaviour. In very general terms, accident-involved and apprehended drinking drivers reveal a high level of deviance in either their drinking habits, driving style and/or other aspects of their social and personal behaviour. One must be careful, however, to avoid over-generalization. Even if a characteristic trait or behaviour is highly represented among drinking drivers, it does not mean that all individuals possessing that trait have a high risk of accident involvement.

The Relevance of Knowledge About Drinking Drivers

Research and other means of advancing knowledge about drinking drivers have received scant attention compared to programs to reduce the frequency of alcohol-impaired driving and related road accidents. The relevance of efforts to provide more in-depth information about offenders--beyond age, sex, and BAC--is often questioned by policymakers, practitioners, and the public. Nonetheless, the relative ineffectiveness of the criminal justice system in dealing with alcohol-impaired driving--a conclusion supported by statistical evidence of the magnitude and persistence of the problem--suggests a strong need to know more about offenders and ways to reduce recidivism. The purpose of improving the very limited knowledge base is to maximize the effectiveness of the criminal justice system, realizing that criminal law, law enforcement, and penalties upon conviction alone cannot produce substantial reductions in the problem.

The traditional emphasis on criminal law and its enforcement as a "solution" to the problem of alcohol-impaired driving greatly influences current thinking. Citizen activist groups have spearheaded a renewal of the "war against drink drivers" and have advocated stronger use of the criminal justice system in dealing with the problem. Their calls for harsher penalties for all persons convicted of alcohol-related driving offences do not reflect the great diversity of offenders or the wide range of seriousness of their offences. Experts have criticized this approach, citing evidence of its past ineffectiveness and even its counterproductive effects. The ensuing debate, which continues today, relates to the more general issue of the proper scope of criminal law and its application in this area of concern.

What is needed is a comprehensive reassessment of criminal law in relation to alcohol-related driving offences. There exists a substantial gap between the crime of alcohol-impaired driving as symbolized in the Criminal Code and the actual beliefs, attitudes, and practices of the general public. The obvious reluctance of people to consider alcohol-impaired driving a "criminal behaviour" stems from their own willingness to engage in this behaviour. Moreover, offenders tend to

represent a more complete cross-section of the population than people who commit "real" crimes. The apparent discrepancy between present criminal law and widespread acceptance of drinking and driving as socially normative behaviour has strong implications for how to deal with people convicted of alcohol-related driving offences.

Nonetheless, for all practical purposes, the criminal law and the criminal justice system will remain heavily involved in dealing with alcohol-impaired driving and the vast majority of offenders. It is imperative, therefore, that the following issue be carefully studied and, to the extent possible, resolved:

Given the diversity of people who engage in drinking-driving behaviour and the wide range of consequences thereof, how can the criminal law be best employed to deal effectively with alcohol-impaired driving and, by extension, the deaths, injuries, disabilities, and other losses due to alcohol-related road accidents?

This question seems best addressed in light of the purpose and principles of application of criminal law.

- o In order to deal fairly and appropriately with behaviour that causes or threatens serious harm, it is important (1) to distinguish which types of drinking-driving behaviour threaten real harm and (2) to determine how to deal in a fair and reasonable manner with offences that range from minor to very serious.
- o The need for maximizing the deterrent effect of criminal law and sanctions has to take into account the extent to which legal solutions interfere excessively with individual rights and freedoms. Sanctions should relate directly to the gravity of the offence and the responsibility of the offenders.
- o Rehabilitation, in addition to retribution, is an intended function of sentencing. If the cause of a problem is not eliminated, the symptoms may reappear, no matter what the severity of penalty. More attention to rehabilitation, especially for "problem drinkers" and "alcoholics", is warranted in the context of criminal law.

Determining how society can deal most effectively with alcohol-impaired driving as a social problem with legal implications--in accordance with the purpose and principles of criminal law--depends greatly on information about the characteristics of offenders and how these characteristics interact with different sanctions to accomplish the goal of reducing alcohol-related road accidents.

The need to advance knowledge about drinking drivers in general and those convicted of alcohol-related driving offences in specific relates to the traditional aims of sentencing: deterrence, retribution, incapacitation, and rehabilitation.

With respect to the deterrent effect of penalties for alcohol-related driving offences, it seems clear that increasing the severity of sanctions is less effective than increasing the perceived risk of arrest. High-risk subgroups of alcohol-impaired drivers may not be deterred at all, even after one or more convictions. This indicates the need to know which types of offenders belong to "low-risk" and "high-risk" categories and which penalties and conditions of probation reduce recidivism for different groups of offenders.

Retribution for criminal offences is a cornerstone of the structure of criminal law. The extent of punishment for alcohol-related driving offences and the severity of penalties may not relate simply to the rate of recidivism. Excessively severe or inappropriate sanctions may increase recidivism among some groups of offenders. Beyond "tempering justice mercy", we have to consider the possibility that punishment per se can exacerbate "root causes" of alcohol-impaired driving and increase the likelihood of repeated offences among certain groups of offenders. Investigations into which offenders respond to what degree of severity of punishment is crucial to developing sentencing guidelines.

Incapacitating offenders in order to prevent subsequent offences involves sanctions ranging from imprisonment to court-ordered prohibitions of driving. There is little information on which method of incapacitation is most effective for which types of offenders. For example, the

common practice of suspending driving privileges may work well for many offenders, but allow others to operate motor vehicles freely and to commit even more serious alcohol-related driving offences. In the absence of efforts to advance knowledge in this area, the success of methods of incapacitation will remain on a "hit-or-miss" basis.

Rehabilitation--including education, treatment, or retraining programs--addresses "root causes" of alcohol-related driving problems. The appropriateness of different programs offered in lieu of or in addition to punitive sanctions for different groups of offenders remains largely unstudied and therefore not known. Also unknown is which kinds of treatment programs for persons who consume alcohol frequently in large volumes are effective for whom. Our present knowledge base cannot provide the guidelines necessary for informed sentencing decisions. Given the scarcity of treatment facilities, the need for selective referrals, based on characteristics of offenders, is acute.

The term research has negative connotations for many concerned with drinking-driving problems. Some even consider a call for more research to advance knowledge about the problem another way of "doing nothing". These and similar attitudes and beliefs about research impede progress in maximizing the effectiveness of criminal law and the criminal justice system in dealing with persons convicted of alcohol-related driving offences. The principle that understanding a problem and its underlying issues leads to more effective control measures, while accepted by policymakers, practitioners, and the public in the practice of Medicine, has yet to be accepted in the application of criminal law to drinking-driving problems. The need for better information is as obvious as it is critical. Only the acceptance of this need by those concerned and involved with the problem of alcohol and road accidents seems in doubt. Beyond acknowledgement of the need for knowledge relevant to operational programs, we still await a genuine commitment to obtain that information.

Sentencing Options: Implications for Future Action

Present knowledge of the characteristics and attributes of drinking drivers seems extensive, given the number of available reports and the wealth of statistics. Close scrutiny reveals little depth of information. Few investigations have examined the relationship between the characteristics of offenders and the different types of sanctions or sentencing options. On the one hand, we know that persons convicted of alcohol-related driving offences represent a broad cross-section of society. We can infer with some certainty that subgroups of offenders will respond differently to various programs. On the other hand, we simply lack hard data on which types of offender will benefit most from which type and severity of sanction.

Several studies reported in the literature indicate that information useful in deciding among sentencing options can be obtained. Data on the Canadian experience, however, have yet to be gathered--or, if collected, they have not been reported. Comprehensive information on all groups of drinking drivers has great value for the numerous and diverse efforts to reduce alcohol-impaired driving and its consequences. If the criminal law and the criminal justice system are to play a more effective role in preventing alcohol-related road accidents, then knowledge in three specific areas must be advanced.

- o the characteristics and social circumstances of persons convicted of alcohol-related driving offences across the range of seriousness;
- o the appropriateness of various sanctions for different subgroups of offenders; and
- o the type of programs most effective in reducing recidivism for identified subgroups of offenders.

The fragmented, uncoordinated approach to obtaining relevant data has failed to provide a sound base of knowledge for effective use of sentencing options. Concerted efforts to generate needed information should now have high priority if reducing recidivism among offenders

remains a major aim of policy, plans, and programs. In the absence of systematic, focused research, accomplishing this aim seems more wishful thinking than clear intention.

Realistically, few if any experts in the field expect substantial funding for "research projects", especially for relatively large-scale, prospective surveys of persons convicted of alcohol-related driving offences. The current emphasis is on action programs, with research to understand the problem having very low priority. The perceived dichotomy between "doing something about the problem" and "studying the problem" is unfortunate, however inevitable. Nonetheless, we have to confront an obvious, if difficult, choice:

1. Maintain the status quo--do little or nothing--and expect little or no advance in knowledge and little, if any, improvement in the effectiveness of using the criminal law and the criminal justice system in dealing with drinking-driving problems.
2. Initiate a strong program of research and development aimed at increasing knowledge useful in developing innovative approaches to sentencing and in rationalizing the use and application of sentencing options.

This assessment may appear overly blunt and overstated. The long history of societal efforts to deal with alcohol-impaired driving, however, solidly supports the conclusion. Experts, achieving a rare consensus, have acknowledged the need for a major, coordinated, long-term effort, unified by a detailed, implementable strategic plan. The strategy would combine and integrate three critical components or functions: action, evaluation, and research. To develop and implement such a strategy and to ensure its viability over time, an explicit policy must be established and a sincere commitment to its elaboration must be made.

A simple model is presented to define the structure and process of the recommended strategic approach. In this model, action, evaluation, and research become integral, functional components, each playing a critical

role at the level of specific programs and at the level of broader based, more comprehensive responses. Activities associated with each component and with pairs of components, when coordinated, comprise the iterative cycle of programmatic initiatives (action); assessment of design, conduct, and impact of programs (evaluation); and data generation and information processing (research). The essential feature of this model is the opportunity to advance knowledge about a specific problem or to resolve issues in the process of taking action to reduce the problem itself.

This model has great value in the area of sentencing options for persons convicted of alcohol-impaired driving and related offences. An outline of a programmatic initiative shows how the model could be applied to make the most effective use of sentencing options. Knowledge important to refining programs and to developing innovative sentencing options would increase over time, thus supporting the overall effort to reduce recidivism.

CHARACTERISTICS OF DRINKING DRIVERS

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1.0 INTRODUCTION

We summarize in this report present knowledge of attributes and characteristics of drinking drivers, emphasizing where possible findings from studies done in Canada. The primary purpose of this report is to compile information useful to developing policy in the area of drinking and driving and to considering sentencing options. In this context, we also identify informational gaps that, if filled, would contribute to the development of programs based on legal, health, educational, and other approaches.

1.1 Background and Approach

Each year in Canada, road accidents cause thousands of deaths, hundreds of thousands of injuries, and other losses totalling billions of dollars. Alcohol-impaired driving remains the single most frequent factor in these accidents. Between 10 and 15% of all road accidents involve someone who has been drinking; about 50% of accidents resulting in one or more deaths involve road users who have consumed alcohol. In recent years, citizens' groups formed by victims of alcohol-related accidents have focused attention on the drunk driver. This has led to renewed efforts to reduce the alcohol-crash problem, from increased law enforcement to increased penalties for those convicted of alcohol-impaired driving offences.

This report addresses a question basic to understanding and preventing alcohol-related road accidents:

- o **Who is the drinking driver?**

Knowledge of the characteristics and attributes of persons who drive after drinking can support the development of programs aimed at specific target groups. In asserting this, we assume that all drinking drivers are not the same and that different approaches tailored to dissimilar groups might well have greater effect, at least in the long run. In-depth information on certain sub-groups of drinking driving--for

example, persons convicted of alcohol-impaired driving--is needed to identify the nature and severity of penalties that reduce recidivism, the rate at which persons are arrested and convicted for second and subsequent offences. The requirement for such information assumes that different penalties would be appropriate for different sub-groups of offenders rather than one standard penalty and degree of severity for all.

In this project, therefore, we assessed the present state of knowledge concerning different populations of interest in the area of drinking and driving:

- o people who drive after drinking (the population at risk);
- o people who drive while impaired and who are arrested for this offence including recidivists; and
- o people who become involved in road accidents after consuming beverage alcohol (crash population).

This project involved searching the extant literature; identifying documents of potential relevance; reviewing those dealing with selected topics; and preparing a synthesis of findings from multiple studies. In addition, unpublished secondary data from TIRF and other agencies were compiled for analysis. These included 1982 data on persons arrested for alcohol-impaired driving offences in Canadian jurisdictions, collected by the Department of Justice in cooperation with municipal police forces.

1.2 Organization and Scope of Report

The study produced a wealth of detailed data, not only on each population of interest but also on intergroup comparisons. In order to minimize the "forest-and-the-trees" problem, we have organized this report as outlined below.

Section 2.0, Who is the Drinking Driver? A Perspective and Overview discusses the general topic characteristics of drinking drivers and provides an overview of the present state of knowledge.

Section 3.0, People Who Drive After Drinking: Populations of Interest and Intergroup Comparisons, briefly describes three populations of interest: drinking drivers, alcohol-impaired drivers, and accident-involved drinking drivers. Appendices to this report contain more detailed information for the interested reader. Next, different groups of drinking drivers are compared in terms of age, sex, BAC, and other variables. The purpose of this section is to identify (to the extent possible) any attributes or characteristics that distinguish various groups and that indicate differences relevant to sentencing, prevention programs, and treatment and rehabilitation.

Section 4.0, The Relevance of Knowledge About Drinking Drivers, discusses why better, more comprehensive information is needed to increase the effectiveness of the criminal justice system in dealing with the problem of alcohol-related driving offences. The discussion centers around the purpose and principles of criminal law and the traditional aims of sentencing.

Section 5.0, Sentencing Options: The Present State of Knowledge and Implications for Future Action, addresses the issue of how to obtain needed information in the context of taking action to reduce alcohol-impaired driving. A model for the development and implementation of strategic programs is described and illustrated.

Section 6.0, References, lists reports and articles cited in the text alphabetically by author.

As noted above, this report has several appendices that present detailed information on four groups of drinking drivers:

- o Appendix A. Characteristics of Drivers on the Road: Roadside Surveys of Alcohol Use by Drivers.

- o Appendix B. Characteristics of Persons Arrested and Convicted for Alcohol-impaired Driving.

- o Appendix C. Characteristics of Drivers Injured in Road Accidents.

- o Appendix D. Characteristics of Drivers Fatally Injured in Road Accidents.

Each appendix selectively emphasizes Canadian studies where possible. An exhaustive compilation of statistics from the international literature was not feasible, nor particularly useful for the purposes of this report. More comprehensive information than that summarized in the appendices can be found in the original articles cited in this report and others (e.g., Jones and Joscelyn 1979a,b; Warren and Donelson 1982; Vingilis 1983).

2.0 WHO IS THE DRINKING DRIVER? A PERSPECTIVE AND OVERVIEW

This section introduces the general topic--characteristics of drinking drivers--by addressing issues surrounding the question: Who is the drinking driver? The issues relate to two key problems: (1) how we view and conceive of the drinking driver; and (2) the limited state of knowledge beyond basic, descriptive data (e.g., age, sex, and BAC). In the longer term, these issues may have more import for formulating policy and designing programs than present information from past scientific studies.

Three subsections below discuss the issues. The first deals with defining populations of interest, including high-risk subgroups of drinking drivers. The second discusses the potential value and usefulness of information on drinking drivers to program development. The third provides an overview of the state of knowledge and identifies issues that have contributed to its slow advancement over the past decades.

2.1 Drinking Drivers: Populations of Interest

When we look beyond alcohol per se as a "cause" of road accidents to the people who consume alcoholic beverages and drive, we usually begin by categorizing drinking drivers. As illustrated in Figure 1, the general population of interest includes all drivers who consume alcoholic beverages at least occasionally (or, conversely, all people who drink and sometimes operate motor vehicles). Some sub-populations (drivers who never consume alcohol, drinkers who never drive, and people who do neither) are not of concern here.

Within the general population of interest, we can define several target groups for study or action: drinking drivers (those who drive with positive blood alcohol concentrations [BACs]); alcohol-impaired drivers (those who drive with BACs in excess of the statutory limit [80 mg alcohol per 100 ml blood] or who become impaired at lower BACS); and accident-involved drinking drivers (symbolized by the squared "C" in

FIGURE 1
POPULATIONS OF INTEREST IN ALCOHOL AND TRAFFIC SAFETY

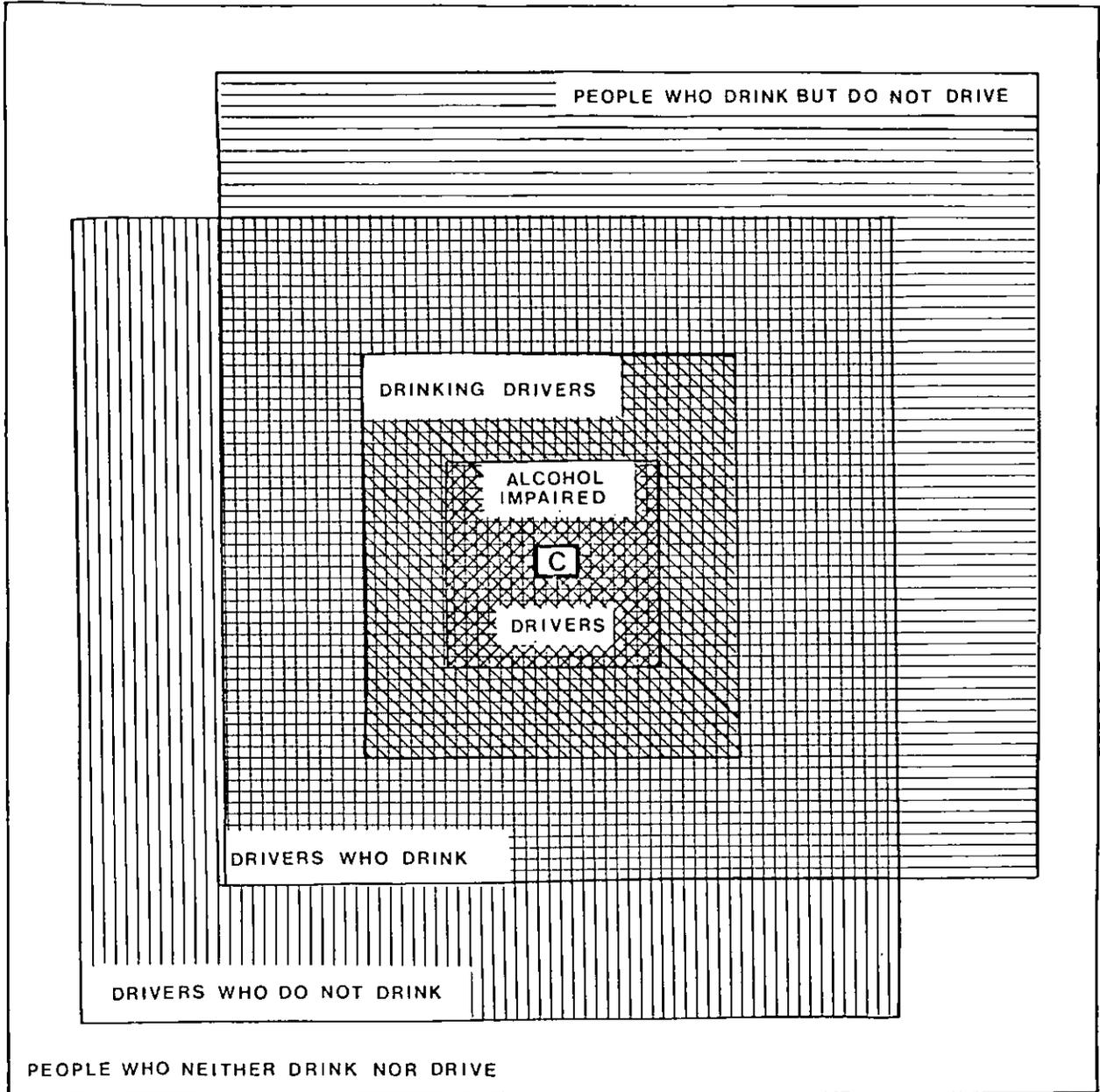


Figure 1). Unfortunately, this approach to defining target groups has certain drawbacks that limit its value for program development and countermeasure initiatives.

First, the various labels (e.g., "drinking drivers") do not describe durable attributes or characteristics of people or groups of people. Like alcohol-impairment, a temporary condition or state, the act of driving after drinking usually lasts only a fraction of the time a person spends in a given period. Exceptions undoubtedly exist (for instance, an alcoholic taxi driver); however, for the vast majority of people, we can safely assume that each becomes a "drinking driver" for a relatively short time, and then exits that population--safely, under arrest, or accident-involved.

Second, the labels lend themselves to stereotyping. The so-called "killer drunk" as well as the "drunk driver" become mythologized, obscuring a more complicated reality, which features diverse patterns and outcomes of drinking-driving behaviour as well as diverse types of people who engage in that behaviour. They tend to connote moral reprehensibility, social pathology, alcohol dependency, and general irresponsibility. Otherwise upstanding people (understandably) do not relate to such images in a personal way, especially when associated with impersonal informational campaigns on drinking and driving. Stereotyping may encourage public indignation but not necessarily the average individual's accepting responsibility for its solution.

Third, labelling populations of interest (pejoratively or not) provides only a vague set of nonoperational categories for identifying high-risk subsets of drinking drivers for preventive measures designed to reduce the alcohol-crash problem. Furthermore, the categories are not mutually exclusive over time. Variables such as age, sex, and BAC assist in stratifying populations within categories. Social and psychological data, especially those that measure personal and behavioural attributes of persons who drink and drive, provide information of greatest value. Labelling as a basis for target group identification merely encourages

the notion that present knowledge is adequate for new initiatives in the absence of more informative data.

Figure 1, therefore, conceals almost as much as it reveals. The static depiction of populations of interest cannot capture the dynamic nature of drinking-driving phenomena. At the same time, unfortunately, it represents very well the present state of knowledge. Past research, with a few exceptional studies, has scarcely gone beyond looking at unrepresentative samples of different populations of interest. Information from past studies allows a general description of people found in those populations at specific times and circumstances. The data do not describe how people enter and exit different populations (or, more accurately, risk states), how often, why, and with what likelihood of particular outcomes. Moreover, the identification of high-risk target groups for preventive measures--as opposed to punitive action--remains far from complete.

Past beliefs about problem drinking-drivers have reflected, for the most part, prevailing notions concerning people who drive and people who drink. Early in the alcohol/traffic safety experience, the "drunk driver" became the target of legal measures aimed at reducing a perceived--but ill-defined--alcohol-crash problem. This stereotype mirrored the picture of all those who succumbed to "demon rum", the difference being only that these people happened to own and operate "motorized wagons". As the medical community came to accept certain patterns of alcohol consumption as addiction (similar to the chronic, compulsive use of opium-derived drugs), the "disease model" of alcohol-related problems gained ground (Jellinek 1960). By the late 1960's, experts in the area of drinking and driving had conceived of the health-legal approach. The criminal justice system would act as a "case-finding mechanism"; the health care system would function in its traditional role, providing treatment and rehabilitation for those dependent on alcohol. This approach paralleled the trend in Western society to view drunkenness per se as unsafe or unhealthy as opposed to immoral or illegal. The degree to which the medical paradigm had a lasting impact on the public or the

judiciary seems debatable. For example, in recent years citizen activist groups have insisted that "drunk drivers" be considered and treated as criminals, whether or not offenders evidence problem drinking or alcoholism.

In general, scientific definitions of "drunk driving" incorporated into Law competed (successfully) with medical considerations. For example, Section 236(1) of the Criminal Code provides that a person who operates or has care or control of a motor vehicle commits an offence if that person has a BAC exceeding 80 mg%. This statute, a so-called per se law, greatly simplified prosecution of alcohol-impaired driving cases. It addressed the need to process the great number of such cases more quickly and efficiently. Other sub-sections (234(2) and 236(2)) offered the opportunity to implement the health-legal model in Canada:

Notwithstanding subsection 662.1(1), where an accused pleads guilty to or is found guilty of an offence under subsection (1) [both 234(1) and 236(1)], the court before which he appears may, after hearing medical or other evidence, if it considers that the accused is in need of curative treatment in relation to his consumption of alcohol or drugs and that it would not be contrary to the public interest, instead of convicting the accused, by order direct that the accused be discharged upon conditions prescribed in a probation order, including a condition respecting his attendance for curative treatment in relation to his consumption of alcohol or drugs, and the provisions of subsections 662.1 (2) to (4) apply mutatis mutandis.

These subsections, in highly technical language, authorize courts to discharge persons who plead, or who are judged, guilty of the offence, without conviction, on conditions including treatment for alcohol and drug problems. This represents a pure "health-legal" model. In this model, treatment and rehabilitation of substance abuse problems-- antecedent to the offence itself--takes precedence over punishment for the crime the problems engender. Interestingly, only Alberta, the Northwest Territories, and Prince Edward Island have proclaimed subsections 234(2) and 236(2) in force. The reluctance of other jurisdictions to proclaim them in force may have stemmed from their

perception that "problem drinkers", "alcoholics", and "drug abusers" would escape sanction and thus avoid just punishment for a criminal act. More jurisdictions might have proclaimed the subsections in force had both conviction and sanctions been provided for, in addition to probationary conditions that included treatment and rehabilitation. Other factors contributing to the lack of acceptance of these subsections may include the cost of treating persons for substance abuse problems; the perception that treatment programs are ineffective; and the inability of existing facilities to handle large numbers of cases. In any event, recent trends have obscured these issues. As noted above, citizen activist groups stress the criminal nature of alcohol-impaired driving, not its etiology (i.e., cause), be it alcohol dependency or otherwise. The focus has again shifted to punishment first, treatment second, if at all.

The predominance of scientific and legal definitions of "drunk driving" extends past medical considerations to more practical ones. Scientific evidence--no less than that which supports present statutory limits on blood alcohol concentration (BAC)--indicates that most people cannot calculate (nor even can conceive of calculating) their BAC after drinking. This is analogous to enforcing posted speed limits, knowing drivers have no speedometers in their vehicles. Not well appreciated, therefore, is that many people may be unable to comply with a law cast in terms they do not understand and for which they have no reference to objective measures--even if they do exercise some control over their use of alcohol (Beirness and Donelson 1983).

This illustrates another prevalent idea about the "problem drinking-driver": that people who drive with BACs above the statutory limit are simply ignorant, unaware, ill-informed, uneducated, or stupid. The idea persists, exemplified by endless mass media campaigns and myriad "BAC Charts". Surveys indicate, however, that current patterns of drinking-driving behaviour are characteristic of a sophisticated, well-informed public. Few seem to appreciate this disparity. On one hand, people have an acute awareness of the problem, and most know the legal limit of 80 mg%. On the other hand, people have no sense of their own BAC in

relation to their willingness to drive or their feelings of impaired ability.

The notions that "people should know better" and that "people are basically irresponsible" have led in recent years to a re-emphasis of the "stick approach": law-based, punitive measures and consistent calls for "harsher laws and stiffer penalties" by citizens' groups. Almost forgotten now (or at least neglected) are findings from past studies showing that many (perhaps as much as 50% [Vingilis 1983]) of those convicted of alcohol-impaired driving offences are "alcoholics". Not taken into account are prevailing (and paradoxical) attitudes among the drinking-driver population, which lead to acceptance of this behaviour as essentially noncriminal, if not normative. Moreover, depictions of drinking drivers in general as ignorant, irrational, and irresponsible are not consistent with the subjective judgements and experiential outcomes of those who drive after drinking. As discussed in detail elsewhere (Warren 1982), the fact that the vast majority of "drunk-driving" trips result in no damage or arrest tends to reinforce and even justify the behaviour as rational and "safe" in the minds of those who engage in it. Small wonder many pay lip service to the admonition "Don't drink and drive"--and do otherwise. This gap between social goals and personal perceptions greatly complicates efforts to decrease the acceptability of drinking and driving. It also greatly separates popular views of stereotypical drinking drivers from the real world of people and their actual behaviour, hindering progress in this area.

In summary, we have come nearly full circle since the major wave of public concern circa 1970. "Problem drinking-drivers" remain with us. Our programs have treated this group of people as killer drunks, irresponsible social drinkers, alcoholics, criminals, and the like. None of the stereotypes do justice to the human and social circumstances of persons arrested and convicted of alcohol-impaired driving offences. Nor do such labels offer any descriptive or analytical value in identifying offenders for appropriate sanctions, be the penalties punitive or the conditions of probation rehabilitative. We as a society have not

appreciated the complexity and the dynamics of drinking-driving problems, nor have we increased our understanding of drinking drivers beyond simplistic labelling.

2.2 The Value of Information about Drinking Drivers

To reduce alcohol-crash losses, both human and economic, is an aim common to many different approaches: legal, health, educational, technological, and others, including combinations of these. The usefulness and value of identifying high-risk target groups in specific, and the importance of describing the attributes and characteristics of drinking drivers in general, depends in part on the countermeasure approach. For example, if passive, technological approaches are considered (for example, air cushions and automatic safety belts, more crash-worthy vehicles), information about who becomes accident-involved, and about whether they have consumed alcohol or not, has little or no use. Law-based enforcement programs that target illegal BACs to enhance the perceived risk of arrest do not depend on knowledge of who drinks and drives, just how many and how often! In the first example, amelioration of accident losses by reducing damaging energy transfers is the specific objective, not preventing road accidents. In the second example, the legal approach may serve as a preventive measure to the extent that alcohol-impaired drivers are removed from the population at risk (specific deterrence) and to the degree others are deterred from driving while impaired (general deterrence). The effectiveness and cost-efficiency of the latter approach, recently called into question, has yet to be established, at least in terms of reducing the alcohol-crash problem.

Concerning the latter example, a qualification about the relevance of information about drinking drivers seems in order. Limited knowledge about who drives while impaired may not hinder law-based enforcement programs (e.g., selective traffic enforcement programs [STEP], R.I.D.E. [in Toronto]). Lack of such information will render evaluations weak if not worthless. For example, experts in Sweden have claimed that the frequency of driving with a BAC greater than 50 mg% is 1% or less. In

spite of this apparent success in reducing the alcohol-impaired driving problem, they still find that high percentages of fatal road accidents involve alcohol. (See Ross [1982], pp. 60-70). One might hypothesize that persons deterred from driving while impaired by legal countermeasures are those least likely to have alcohol-related traffic accidents. In the absence of data adequately describing the different populations, such an hypothesis cannot be tested. In fact, the question of why deterrence measures have seemingly failed to reduce alcohol-crash losses substantially remains unanswered--and unanswerable!

Of growing interest to the field (and least studied) are primary preventive measures using educational, health, and social/behavioural approaches, including comprehensive community-based initiatives. "Primary prevention" refers to approaches and programs that "intervene" before behaviour or conditions lead to increased risk to health or safety, and before risks become consequences. These approaches, like their counterparts in medical and other health-related disciplines, depend for success on identifying target groups appropriate to the chosen "treatment" and which are amenable to change given that treatment. For instance, an educational program for persons convicted of impaired driving might have a three-fold purpose: (1) the transfer of useful knowledge about the consumption of alcohol, its effects, and their relation to BAC; (2) the self-assessment of lifestyle including patterns of alcohol consumption; and (3) the consideration of entering a treatment or rehabilitative program subsequent to the completion of the course. Such a program may have a low "success rate" (perhaps defined as recidivism rates; pre- and post-test knowledge scores; etc.) simply because many of those referred to the course could not relate to, or benefit from, the course content. Knowledge of the attributes and characteristics of persons who do find value from the course (again measured as rates of re-conviction, knowledge gained, percentage entering treatment) would permit selective referral and increased efficiency in the allocation of resources. This relates more broadly to the general issue of sentencing options, and how to select from among various alternatives for people convicted of alcohol-impaired driving.

2.3 An Overview of the Present State of Knowledge

Research has demonstrated a strong association between BAC and the relative likelihood (or risk) of accident involvement. If BAC were highly correlated with accident risk independent of other factors, then the question "Who is the problem drinking-driver?" would be interesting, but not particularly useful. Data on BAC alone would suffice to characterize "high-risk" drinking drivers. As amply shown by a landmark study (in Grand Rapids, Michigan, between 1 July 1962 and 30 June 1963) such is not the case. Borkenstein et al. (1964) found eight other factors associated with accident risk to some degree: time of day; age; occupation; race; driving experience; drinking experience; marital status; and gender. Similarly, in a series of studies, TIRF found evidence of substantial interactions among the following variables: BAC, age, and exposure (Mayhew 1983; Mayhew et al. 1981). Moreover, even surveys conducted in different places at different times have produced alcohol-risk curves that also differ (Donelson and Beirness 1984).

Zylman (1968) discussed the implications of these findings:

People experienced in the study of social problems will not be surprised to hear that single-cause explanations and simple one-target programs are inadequate. The slogan that "alcohol causes accidents" is just as misleading as the counterassertion that it does not....One of the barriers to change on this level is the power of single-cause and simple interpretations of complex problems, which have dominated American thinking about alcohol. With the increasing social intolerance for the cost of highway damage and increasing demand that something be done, it seems reasonable to hope that the mythical oversimplifications, especially those related to alcohol, will be replaced. That all uses of alcohol by all categories of persons in all highway situations are productive of very serious damage is questionable. There is a clear need to establish the nature of particular uses, users and situations which are highly related to that damage, and to develop and verify means for adjustment. From many viewpoints this does not appear to be too difficult a task, but

it will require a significant change in patterns of thinking about alcohol. (pp. 231-232, emphasis added).

This discussion, a milestone in thought about alcohol and road accidents, has yet to lose its relevance. As Jones and Joscelyn observed in their 1979 report on the state of knowledge, "The most that can be said on the basis of epidemiologic evidence is that, on the average, alcohol, present beyond a certain amount, is associated with increased crash risk. In-depth analysis of the conditions surrounding the crashes would have to be made to support stronger statements about causation" (p.34). By inference, during the intervening decade, "single-cause" and "simple" explanations have continued to dominate the field. Research to define the alcohol-crash problem and to characterize drinking drivers has not received the support necessary to advance the state of knowledge much beyond that of the late 1960's. (This commentary seems truly sad because needed studies require time, substantial funding, and inter-agency cooperation, none of which appear readily available or easily obtained.)

One explanation of the chronic lack of support is the difficult relationship between research to define and understand the problem and action programs to deal with the problem. To many, questions like "Who is the drinking driver?" and "Who is the problem drinking driver?" may have an academic tone, thus more the concern of research groups in ivory-tower settings than of action-oriented governmental agencies. In fact, research and countermeasures have become distinct and often separate pursuits in a supposedly common cause. If "mission-directed" studies can be completed quickly, then "research" is requested and supported by certain funding agencies. If present knowledge and readily available facts support program development, so much the better. Because programs are rarely long-term, comprehensive, evaluated efforts, longer term, systematic, careful research has low priority and rarely receives support. The usual demands for "fast action" and "quick solutions" preclude waiting for results of such research programs. Moreover, longer term, rational program planning often receives little

or no consideration or support. As a result, research efforts and action programs remain uncoordinated and fragmented, with the effort as a whole being less than the sum of the parts. The evident split between research and action persists. Longer term, comprehensive, coordinated approaches to the alcohol-crash problem--especially those that combine and integrate action, evaluation, and research--remain hoped-for goals, not present reality.

This general situation is particularly frustrating when examining the present topic. During the past decade between 500,000 and 1,000,000 people (a conservative estimate) passed through our criminal justice system, charged, convicted, and penalized for alcohol-impaired driving and related offences. These offences comprise about 40% of the case-load faced by courts burdened by back-logs. "Streamlining" court procedures is only one solution to the problem, namely, swift, efficient punishment for the crime. Reducing repeat offences is another, equally important objective. Procedural changes may seem attractive because of their mechanical, short-term nature. Decreased recidivism among first- and second-time offenders may seem less attractive, more tenuous an objective--simply because virtually no one knows, for sure, how to achieve that aim. The past ten years represent a lost opportunity to characterize and distinguish among arrested, convicted alcohol-impaired drivers; to determine which penalties lower rates of recidivism in which groups of offenders; and, thus, to advance the state of knowledge, contributing greatly to policy planning and development. With few exceptions worldwide, "doing something about the problem" has superceded and at times completely replaced efforts to understand the problem itself. The recent trend back to stereotyping persons charged with alcohol-impaired driving helps maintain the status quo.

Lacking systematic, in-depth research on the attributes and characteristics of drinking drivers, the published literature offers only an incomplete mosaic--fragmented, often incomparable studies that vaguely suggest, and do not identify, high-risk groups of these drivers. So, we can define "problem drinking-drivers" as those who are arrested and convicted and those who are involved in traffic accidents. Beyond this

tautology, data are scarce and fraught with pitfalls for analysts dissatisfied with uncertainty. As a conclusion to their review of "people who drink and drive", Jones and Joscelyn cautioned:

Considerable care is required in interpreting the findings of studies of the characteristics of individuals who drink and drive. The reader is alerted to two pitfalls that are common in such interpretations. First, it is sometimes assumed that the finding that a given characteristic is associated with a higher than average alcohol-crash risk means that all individuals possessing that characteristic are high-risk drivers. A second pitfall is the assumption that different characteristics that have been found to be associated with increased accident risk can be combined to form a composite picture of a high-risk driver and that all individuals matching that profile are high-risk drivers. Both pitfalls are to be avoided since they will lead to erroneous conclusions. No characteristics or combination of characteristics can safely be used to identify a given individual as a certain alcohol-crash threat, but can only be used for identifying the alcohol-risk of entire groups of drivers (p. 57).

This caution even extends to the alcoholic driving population. Filkins (1971) reported data from a 6½ year study that analyzed the driving records of 1,247 hospitalized alcoholics. As a group, their 6-year crash rate was nearly double that of a random sample of Michigan drivers from the same age group. Nevertheless, 25% had no recorded crashes or convictions during this period. Filkins warned against the "dangerous...conclusion that all alcoholic drivers are automatically unsafe drivers" (p.6). The clinical diagnosis of alcoholism (which also presents some difficulty) might serve as justifiable grounds for suspension of the driving privilege in some jurisdictions. Nevertheless, many "problem drinking-drivers" have not reached stages of problem drinking associated with either alcohol dependency or alcoholism, however defined. This has profound implications for the design of treatment and rehabilitation programs and for the selective referral of offenders to them.

Simpson (1977) defined a similar dilemma in a paper entitled "The impaired-driver problem vs. the impaired problem-driver". It refers to what one expert described as a "compelling, alternative hypothesis", namely, that the overrepresentation of alcohol in road accidents, especially serious accidents, arises largely from people who engage in high-risk driving behaviour and who also happen to use alcohol (Donelson 1983; Warren and Donelson 1982, pp. 87-92). Educational programs for driver improvement rather than alcohol treatment may have relevance here as a sentencing option (cf. Kunkel 1983).

The foregoing has stressed how the question "Who is the problem drinking-driver?" demands far more than present knowledge offers. The purpose of this discussion is not to imply that the question itself is unanswerable, nor that research cannot address it. Similar questions concerning heart disease and cancer, equally complex phenomena, do not (today) give rise to despair--given advances brought about by intense study costing hundreds of millions of dollars. It is ironic (to say the least) that the alcohol-crash problem, not to mention the overall traffic-crash problem, has yet to receive that kind of attention. After all, motor vehicle accidents are the primary cause of death, injury, and disability among Canadians aged 1-35 years, and one of the leading causes of mortality and morbidity among Canadians of other ages. Methods of research that advanced the state of knowledge and that led to effective treatment and preventive measures for heart disease and cancer have yet to be applied to the study of drinking-driving problems. This, and the lack of commitment to engage such study, form great barriers to progress in the area of drinking and driving, as does the continued preoccupation of those who would "solve" the problem with programs based on single-cause explanations.

2.4 Summary

The topic characteristics of drinking drivers--which might appear simple and straightforward--gives rise to issues that complicate the review.

Popular notions about the "problem drinking driver" ignore human and social dimensions of those convicted of alcohol-impaired driving and related offences. Even the term drinking driver, which implies a durable, personal attribute, fails to capture the dynamic complexity of individual behaviour, embedded in a societal context. In the absence of more definitive knowledge and more informed public opinion, labelling and stereotyping of the drinking driver have taken precedence. In the minds of many, the dark image of the "killer drunk", in spirit if not in fact, applies to all those convicted of alcohol-impaired driving (Section 234(1) or driving with a BAC over 80 mg% (Section 236(1)). This simplistic approach to defining populations of interest for action programs has hindered efforts to identify attributes and characteristics of high-risk subgroups who drive after consuming alcohol. The recent trend toward viewing persons convicted of alcohol-related driving offences solely as "criminals"--without regard to circumstances leading to arrest or to personal problems related to drinking--has tended to decrease concern about differences among offenders. Such differences, however, have great importance in the context of sentencing options and for reducing recidivism.

Knowledge of the characteristics of drinking drivers has value and use in policy planning and program design. The success of policy and the effectiveness of programs depend on accurate, comprehensive information concerning target groups and their responsiveness to various measures and treatment. In the absence of such information, the outcomes of initiatives--whether positive, indifferent, or negative--remain inexplicable, and present knowledge cannot advance. The traditional emphasis on programs without evaluation and research components has contributed greatly to the persistence of this issue.

A basic problem frustrating the growth of knowledge is the artificial dichotomy of research and action programs. Research, which (to many) connotes "academic" study, does support action programs: (1) by defining the problem; (2) by identifying high-risk groups in operational terms, and (3) by developing appropriate intervention tactics based on

the best available information. Nonetheless, "understanding the problem" almost always ranks low in priority compared to "doing something about the problem", even in the absence of adequate data. The separation of research and action programs over two decades has resulted in very little increase in knowledge about drinking drivers. Systematic program planning, along with long-range research, remain hoped-for, but rarely won, objectives.

Thus, the present, limited state of knowledge concerning characteristics of drinking drivers stems from social, legal, and political factors. These factors have overshadowed informational needs as elements of policymaking. Recent (and not so recent) reviews have pointed out the lack of in-depth information on people who drive after drinking. Unfortunately, as subsequent sections in this report indicate, little has changed in Canada to revise this assessment.

3.0 PEOPLE WHO DRIVE AFTER DRINKING: POPULATIONS OF INTEREST AND INTERGROUP COMPARISONS

All people who consume alcoholic beverages and who operate motor vehicles are of potential interest. Patterns of alcohol use and reliance on private transportation make it likely that the majority of people become drinking drivers, at least occasionally. Within the population of drinking drivers--which varies with time of day, day of week, and perhaps seasonally as well--are those who have their ability to drive impaired by alcohol. The statutory BAC limit of 80 mg% is most often used to define this subgroup of drinking drivers. This definition has limitations because it overlooks the fact that some drivers with BACs below 80 mg% are impaired and that some drivers above the legal limit are not. In the absence of more information, however, the statutory limit offers a convenient, objective measure to identify alcohol-impaired drivers. Persons arrested and convicted of alcohol-related driving offences comprise a much smaller but important subgroup of alcohol-impaired drivers. Only a small percentage of the larger group come to the attention of law enforcement officials and become involved in the criminal justice system. Even so, this group includes about 150,000 persons in a year according to the Department of Justice (1983). Finally, from both the general population of drinking drivers and the subgroup of alcohol-impaired drivers come those involved in road accidents resulting in property damage only, injury, and death. Important subgroups of accident-involved drinking drivers include injured and fatally injured drivers.

These populations of interest are not mutually exclusive. For example, an individual on a weekend night may have a drink or two before driving to join friends at a local tavern, entering the drinking driver population. After a few more, he may start driving home (alcohol-impaired driver population). A "fender-bender" in the parking lot places him in the population of accident-involved drinking drivers. After settling with the other car's owner, he continues on his way, back in the impaired-driver population. Should he be stopped in a roadside check, he may enter another population--that of drivers arrested for impaired

driving. Because people who drive after drinking can enter and leave different populations of interest frequently, at any given point in time we find only a static "snapshot" of the various groups of drinking drivers. How we select those drivers for study may bias findings and thus compromise their generalizability. Lacking information on the dynamics of drinking-driving practices, we become less certain that our "pictures" correspond to real-world circumstances. Our "portraits" of the drinking driver may also distort, or oversimplify, the complexity of persons so labelled.

We first approached the characterization of drinking drivers as if various categories (for example, accident- and nonaccident-involved) represented truly distinct groups. This approach is consistent with how information on drinking drivers is reported in the literature. In order to identify characteristics of drinking drivers that distinguish the broad categories, or that distinguish subgroups of drinking drivers within categories, we then compared the populations of interest.

We report extensive data on the separate populations of interest in Appendices A, B, C, and D. In this section we present the findings from intergroup comparisons. In doing so, much of the important information contained in the appendices is brought out in a more succinct fashion to facilitate direct comparisons among the populations. In addition, a brief discussion on recidivist offenders is included.

3.1 Comparisons Among Populations of Drinking Drivers

As discussed in Section 2.1, past attempts to describe the "typical" drinking driver in terms of demographic and personal characteristics has led to labelling and stereotyping--neither of which is particularly appropriate or useful. This process tends to obscure the more complex reality, which features a rather heterogeneous group of people who engage in very diverse patterns of behaviour, all of whom are encompassed by the designation "drinking-drivers". Lacking any definitive means by which to separate different subgroups of "drinking drivers", we operationally define categories based on the outcome of the behaviour--

no consequences, arrest, or accident. These subgroups reflect the manner in which persons are identified as belonging to the general population of drinking-drivers as well as the seriousness of the consequences resulting from their behaviour.

It is important to bear in mind that these groups do not represent distinct entities in the population. Rather, there is likely considerable movement among the groups as individuals enter and exit the various populations (or risk states) at different points in time. This section examines cross-sectional representations ("snapshots") of these groups in an effort to compare and contrast their characteristics along a number of dimensions, including age, sex, BAC and other demographic and psychological variables when available. These comparisons are offered in an attempt to answer the following questions:

- o Are there identifiable characteristics that distinguish the various groups of drinking drivers?
- o Why do some drinking drivers manage to avoid detection and/or accidents?
- o To what extent do factors other than alcohol contribute to the consequences of drinking-driving?
- o Can we use these characteristics to predict which types of individuals are most likely to become involved in an alcohol-related traffic crash?

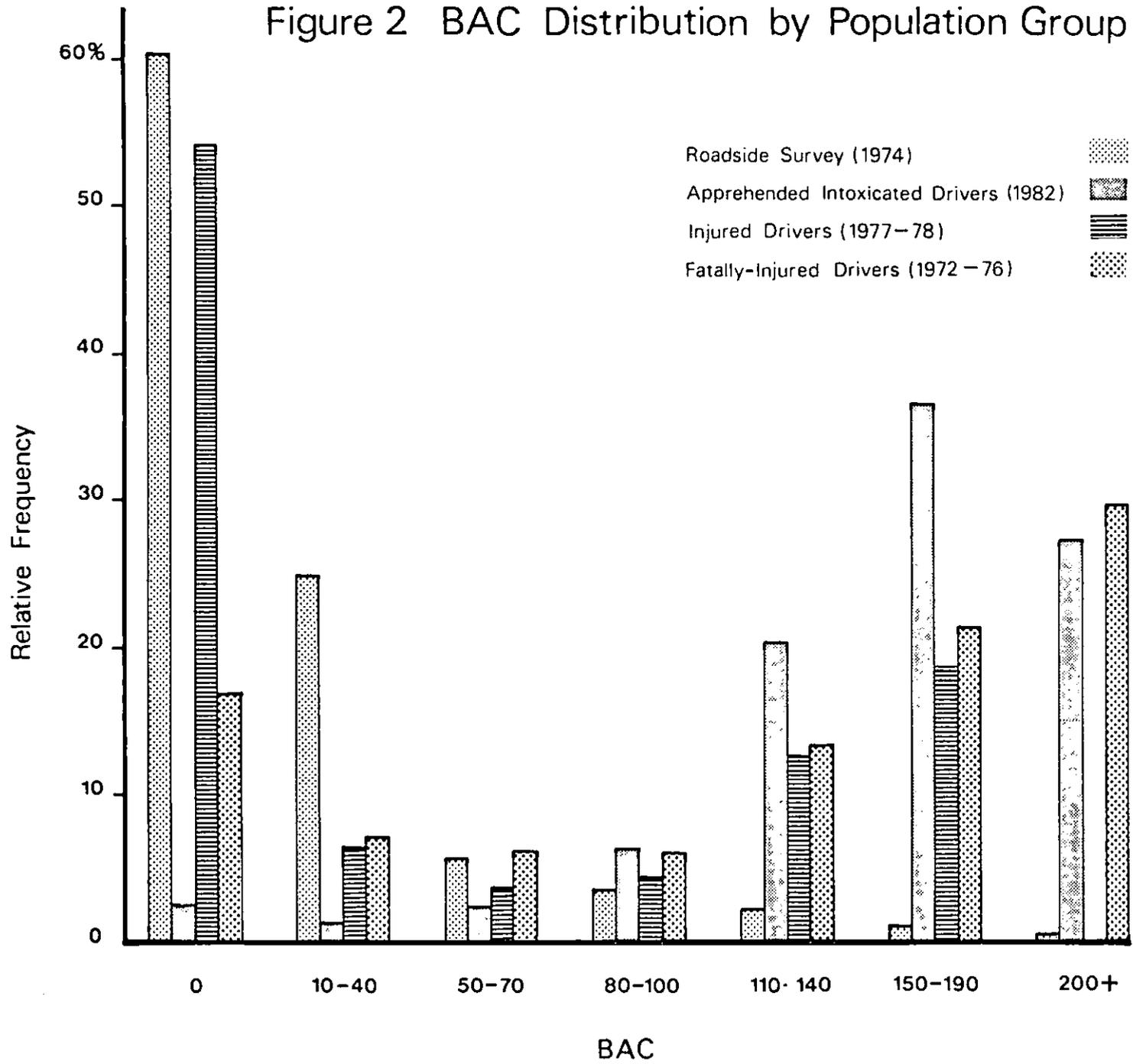
3.1.1 Blood alcohol concentration. One of the more readily measured attributes of drinking drivers is BAC. Not only does this variable serve to define the behaviour, it also quantifies the extent of alcohol use and is often used (albeit loosely) as an indicator of the degree of driver impairment and the seriousness of the offence committed. In addition, Section 236(1) of the Criminal Code of Canada specifies a maximum BAC beyond which it is an offence to operate a motor vehicle. This provides a convenient reference point from which comparisons can be made.

Figure 2 presents the distribution of BAC¹ for each of the drinking driver groups--roadside survey (at risk), apprehended, injured and fatally injured. Information on apprehended drivers was obtained from a data set compiled by the Department of Justice, Canada, with the cooperation of municipal police forces in 31 jurisdictions. The data set contains 22,424 case files coded from the log-book entries of police technicians who administered breath tests to apprehended drivers. The case files, all from 1982, do not represent a random or even a representative sample of the total number of drivers apprehended in Canada during that year. The 31 large municipalities also do not represent regions of Canada in proportion to population. Nonetheless, the data set constitutes the best, most recent source of information on this group of drivers, and is included for the purpose of comparison with other groups. Caution is advised concerning the comparisons made below, however, since the preliminary data on apprehended drivers does have the limitations noted above.

The 1974 Roadside Survey (Smith and Wolynetz 1975; Schliewen 1979) reveals that the majority of weekend nighttime drivers had not been drinking. The proportion of drivers decreases as BAC increases. Approximately 6% of drivers surveyed were found to be legally impaired (i.e., BAC over 80 mg%) and an additional 5% had BACs between 50 and 80 mg%. The distribution of BACs of drivers who were fatally injured during the years 1972-1976 between the hours of 20:00 and 3:00 shows that the proportion increases with rising BAC. This trend is opposite to that evident in the Roadside survey data. It is this disparity between the BACs of drivers on the road and fatally-injured drivers that produces the marked increase in relative risk at higher BACs (e.g., Donelson and Beirness 1984).

¹ Note: Although BAC represents a continuous variable, for ease of presentation BACs were aggregated by 10 mg%, whereby a BAC of 10 represents BACs from 6 to 15 mg%, 20 represents BACs from 16 to 25 mg%, etc. Hence, the stated BAC value actually represents the midpoint of an interval of BAC values.

Figure 2 BAC Distribution by Population Group



The proportion of apprehended drinking drivers also increases with BAC indicating that an individual is much more likely to be apprehended by the police with a high BAC. From data supplied by the Department of Justice, the average BAC of this group was found to be 172 mg% (standard deviation = 54 mg%), more than double the present legal limit of 80 mg%. About 70% of cases had a BAC in excess of 150 mg%. Only 6% were found to have a BAC between 80 and 100 mg%. This would seem to indicate that only the most obviously impaired drivers are coming to the attention of the police. These individuals, based on BAC alone, also happen to be at highest risk of fatal crash.

Two Canadian studies have examined the BACs of drivers reporting to hospitals with injuries following traffic accidents (Warren et al. 1982; Rockerbie 1979). The similarity of the results permitted them to be combined for ease of presentation. As is evident in Figure 2, the distribution of BAC of injured drivers corresponds very closely to that of fatally injured drivers for each BAC group below 150 mg%. Although the data could not be disaggregated for those above 150 mg%, it can be seen that only 19% of injured drivers had BACs above 150 mg% whereas over 50% of fatally injured drivers were above this alcohol level.

The Canadian accident data can be compared with studies from Australia, where blood tests are mandatory for all persons treated at hospitals for injuries sustained in traffic accidents (McDermott and Strang 1978). Because of the compulsory tests, this Australian study consists of over 42,000 cases over a four year period with very few refusals. This is in contrast with 576 cases from two Canadian studies which were conducted over a relatively short period of time with participation being voluntary. The results from both countries, though, are consistent in the demonstration of an increasing proportion of injured drivers with higher BACs. The Australian study, however, found only 26% of drivers had positive BACs, whereas the Canadian studies reported 45%. Although the specific reason(s) for this discrepancy is not known, two contributing factors may be the differences in refusal rates and the size of the sample studied.

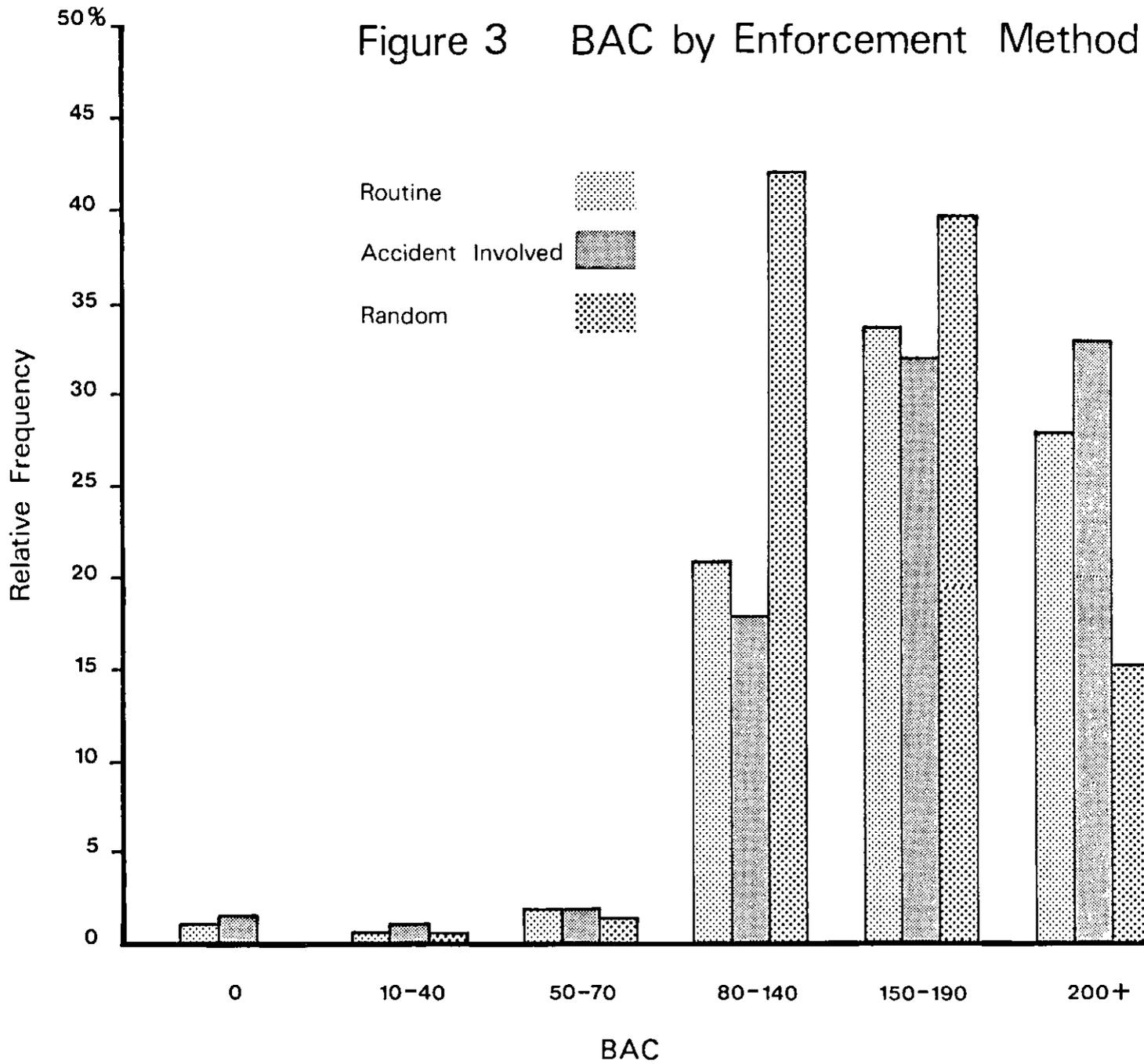
In an analysis of the New Brunswick data, Warren et al. (1982) found that the proportion of individuals who had been drinking increased as a function of injury severity. As well, the level of alcohol consumption increased with the severity of injuries sustained. Of those with minor injuries, 15% were found to have a BAC over the legal limit; of those with severe injuries, 26% had a BAC over 80 mg%. Combined with evidence from fatal accidents, in which approximately 50% had illegal BACs, the pattern that emerges is that the severity of injuries sustained in a motor vehicle accident bears a direct relationship to the BAC of the victim. Serious and fatal injury-producing accidents are more strongly associated with higher BACs than less severe accidents.

The BACs of apprehended drivers were examined by enforcement practice to reveal some interesting trends. From the data supplied by the Department of Justice on apprehended drinking drivers in 1982, there were a number of jurisdictions that indicated whether an individual was apprehended following an accident or as the result of a random roadside check. All other offenders were considered to have been identified through routine enforcement by patrol officers. The BAC distributions for these three methods of enforcement are presented in Figure 3.

The mean BAC of the random spotcheck group was 153 mg% (standard deviation = 45.7 mg%); for the accident group the mean BAC was 178 mg% (standard deviation = 59.8 mg%); and for the routine group, the average BAC was 172 mg% (standard deviation = 54.3 mg%). Statistical analysis revealed that the BAC of individuals apprehended in random spotchecks was significantly lower than that of drivers apprehended by either of the other two enforcement methods.

The greatest proportion of apprehended impaired drivers have BACs between 150 and 190 mg%, regardless of method of enforcement. The BAC distribution of drivers apprehended by routine enforcement is very similar to that of drivers who are tested following their involvement in an accident. The most striking difference occurs with the drivers apprehended in random roadside checks. In comparison with other enforcement practices, this group has the greatest proportion of cases

Figure 3 BAC by Enforcement Method

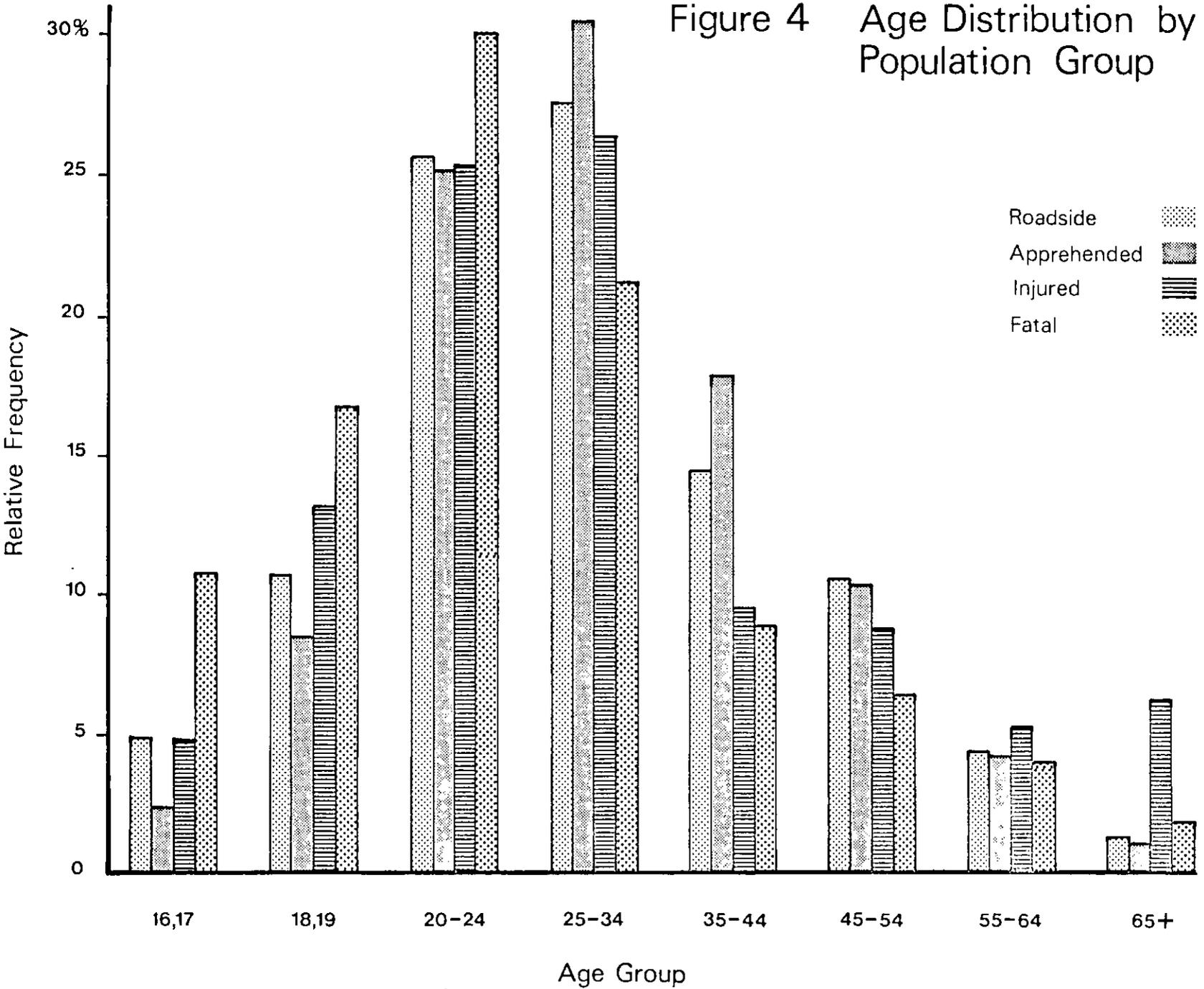


falling in the lowest BAC ranges, particularly the 80-100 mg% range. This would indicate that the "marginally impaired" driver is most likely to be apprehended by police in a random check. In the absence of such checks, these offenders may go undetected. It remains uncertain as to whether this is because drivers with BACs in this range do not usually drive in a fashion that would draw the attention of the police or the police are more concerned and preoccupied with the obviously impaired driver. It appears that routine enforcement of drinking-driving statutes by the police results in the apprehension of the greatest proportion of high BAC drivers and random checks serve to detect those driving at lower, but illegal, BACs.

Drivers apprehended in random spotchecks represent a group of drinking drivers who might not otherwise have been arrested. The data presented above indicates that this group has a quantitatively different BAC distribution than individuals apprehended by routine enforcement or through involvement in an accident. In the absence of further information, it is impossible to determine if the groups differ on variables other than BAC. This group of drinking drivers may, in fact, represent a qualitatively distinct group whose risk of accident involvement may be quite different from that of other groups with similar BACs.

3.1.2 Age. Figure 4 presents the distribution of age for each of the populations of interest. It is apparent that those aged 20-34 comprise the greatest proportion in every population--45 to 53% of drivers in each population are from this age group. This age group is almost equally represented in each of the four populations of interest. One notable exception is the higher proportion of those aged 25-34 in the apprehended group relative to their representation in the fatally-injured population. The rate of apprehension of this age group appears more in line with their representation in the roadside survey. This seems to indicate that their likelihood of apprehension is directly related to their exposure and not necessarily to their risk of being involved in a fatal crash.

Figure 4 Age Distribution by Population Group



An examination of the youngest drivers (aged 16-19) reveals some interesting discrepancies in their representation in the various populations of interest. This group accounts for 23% of all fatalities, 18% of injuries, yet only 15% of the drivers on the road and only 11% of those apprehended! Despite their high risk of fatal crash, this group is not being identified by the police as impaired drivers. This may be partly due to the fact that this age group tends to have relatively low BACs compared to that of the average driver apprehended by police.

Middle-aged drivers (35-44 years) are over-represented among the apprehended and on-the-road populations relative to their involvement in personal injury and fatal crashes. Once again, their rate of apprehension appears to be related to their driving exposure and not their crash-involvement rate.

Another interesting aspect in Figure 4 occurs in the senior citizen (aged 65 and over) group. This group has a very small representation in all populations of interest, except in the injured population where they appear more often relative to the other categories. This may reflect the type of driving (low speed, city areas) and the skill with which these persons operate a vehicle, as well as their greater susceptibility to injury given an accident.

3.1.3 Sex of driver. The proportions of male and female drivers in the various populations is presented in Table 3.1. Without exception, each population reveals an overwhelming dominance of male drivers. Males represent approximately 80% of nighttime drivers on the road, 90-95% of drivers apprehended for a drink-drive offence, roughly 80% of fatally injured drivers and approximately 70% of drivers injured in crashes. On the other hand, females account for almost 20% of driver fatalities but only 5-10% of those apprehended for a drinking-driving offence. It has been suggested (e.g., Homel 1981a) that a selective bias operates against a female driver being charged with a drinking-driving offence.

TABLE 3.1

Sex of Driver in the Populations of Interest

I	<u>Drivers on the Road (At Risk)</u>	<u>Male</u>	<u>Female</u>
	1974 National Roadside	85%	15%
	1979 Ontario Roadside	79.2	20.8
	1981 British Columbia (Mercer 1982)	73.9	26.1
II	<u>Apprehended Drinking Drivers</u>		
	Coldwell and Grant (1962)	99%	1%
	Zelhart et al. (1975)	96	4
	Vingilis (1982)	94	6
	Mercer (1982)	90	10
III	<u>Accident-Involved Drivers</u>		
(a)	<u>Injured</u>		
	Rockerbie (1979)	64%	36%
	Warren et al. (1982)	72	28
	McDermott and Strang (1978) (Victoria, Australia)	70	30
(b)	<u>Fatal</u> (TIRF 1984)		
	1973	88.81%	11.19%
	1974	87.38	12.62
	1975	87.10	12.90
	1976	87.62	12.38
	1977	83.23	16.76
	1978	82.74	17.26
	1979	85.27	14.73
	1980	83.70	16.30
	1981	83.76	16.24
	1982	82.18	17.82

The most notable aspect of the distribution in Table 3.1 is the increasing proportion of females in both the fatal and apprehended populations. The increased representation of females among drivers on the road is evidenced by the roadside surveys. It is unclear as to whether this increase is the result of the "changing role" of women in society which is reflected in either their driving or drinking habits or some constellation of yet unidentified factors. Nevertheless, the changing proportions of women in these populations would strongly suggest that female drivers should not be ignored or overlooked in the consideration of new initiatives in traffic safety.

It is also of concern that the proportion of fatally injured female drivers who were legally impaired (i.e., BAC over 80 mg%) at the time of death has also increased from 11% in 1973 to almost 18% in 1982. While still well below the rate of alcohol involvement in fatal crashes for males, this increase for females warrants greater attention in the future.

The reasons for the increasing representation of women in the populations of interest have not been examined. Current information examining the driving practices, drinking habits and the incidence of drinking and driving among females would certainly be of assistance in attempts to determine both the reasons for, and possible countermeasures against, this situation.

3.1.4 BAC and age. The distribution of BAC by age group in the at risk, apprehended and fatally injured populations are presented in Figures 5, 6, and 7 respectively. Although at first glance it appears as though these figures present three very different patterns, there are in fact notable consistencies among them. For example, the youngest group of drivers (aged 16, 17) are least likely to be driving with a BAC above 80 mg%. This same age group, together with those 18 and 19 years old, shows high representation among those apprehended and killed at the lowest BAC levels. Hence, young drivers are most often sober drivers, but when drinking, even at relatively low levels, they are a very high risk group for accident involvement (Mayhew et al. 1981).

Figure 5 Age by BAC Distribution of Drivers in the 1974 Roadside Survey

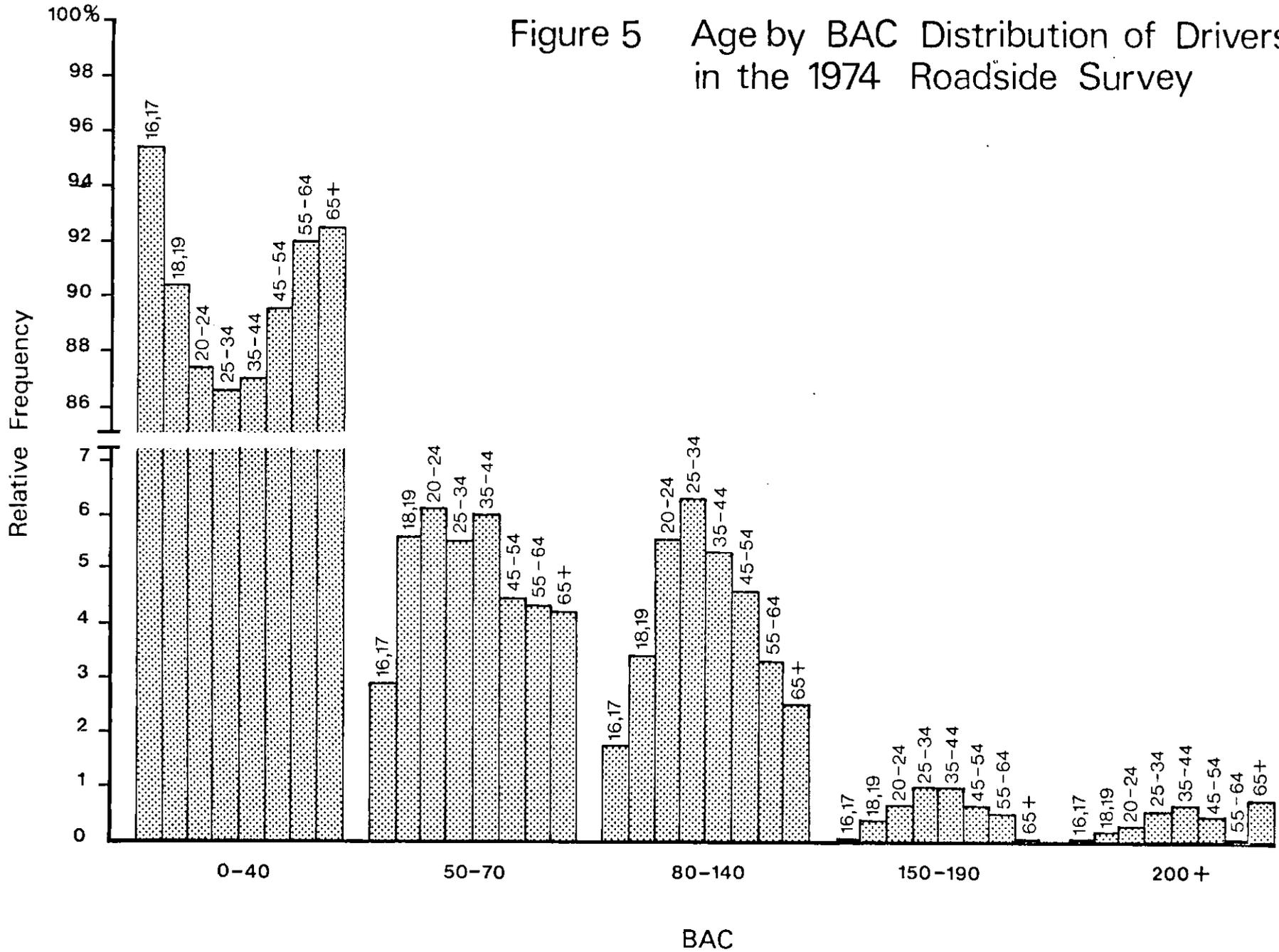


Figure 6 Age by BAC Distribution of Apprehended Impaired Drivers

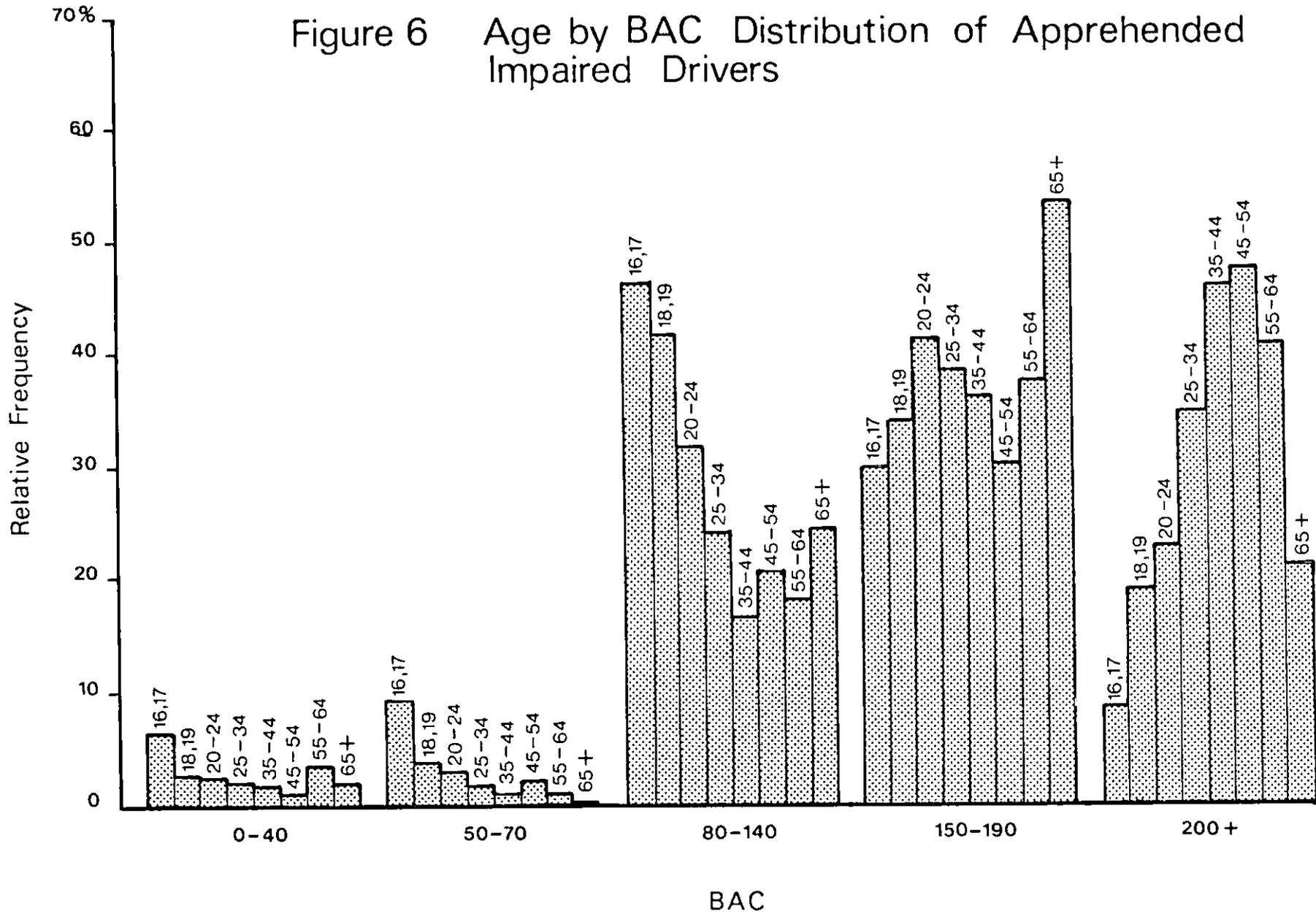
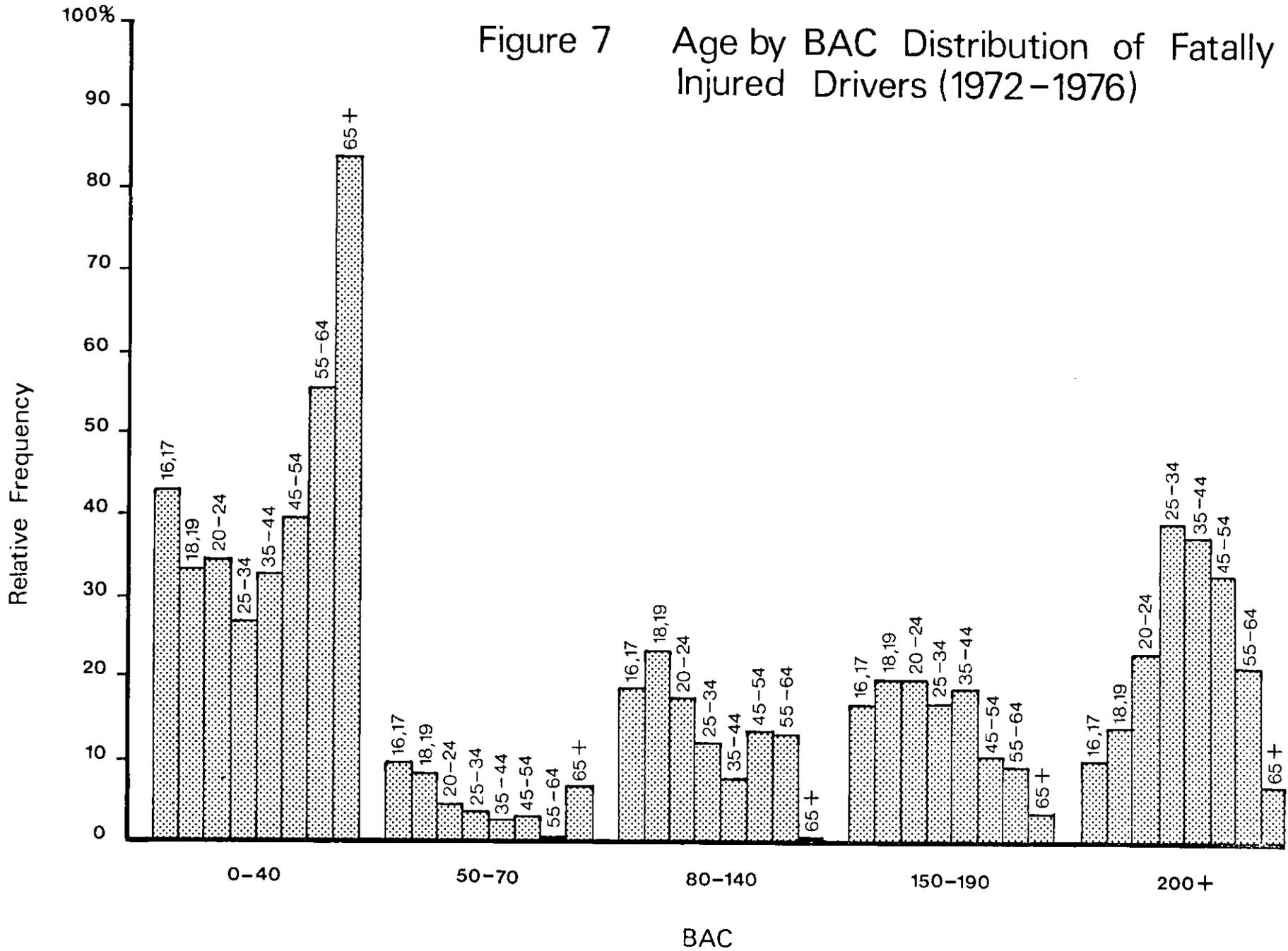


Figure 7 Age by BAC Distribution of Fatally Injured Drivers (1972-1976)



The 25 to 44 year old groups reveal a somewhat different trend. These drivers are the most likely to have been drinking and most likely to have a BAC over 80 mg%. These drivers are also highly represented among apprehended and fatally injured drivers at very high BACs.

The drinking and driving patterns of elderly drivers (65 years and over) are, in many respects, similar to those of young drivers. Over 90% of individuals in this age group were found to be driving while sober in the roadside survey. When positive BACs were found, they were generally in the lower ranges. Among fatalities in this age group, most were either sober or at very low BACs. It is interesting, however, that within this age group, the majority who were apprehended by the police had BACs between 150 and 190 mg%.

In summary, there is a complex interaction between age and BAC among the populations of interest. The youngest and oldest groups of drivers have a tendency to be represented at relatively low BACs, whereas drivers between the ages of 20 and 44 tend to be overrepresented at the highest BAC levels.

3.1.5 BAC and sex of driver. The BAC distributions by sex of driver are presented for the roadside, fatality, and injury populations in Table 3.2. In all three populations, males are most likely to have been drinking. Males were also more likely than females to have high BACs. However, as indicated previously, the proportion of females who drink and drive has been rising in the last several years.

This interaction between sex and BAC has also been demonstrated in Australian studies of both drivers on the road (Duncan 1976) and injured drivers (McDermott and Strang 1978). This latter study also indicates that the representation of females with positive BACs and illegal BACs increased noticeably between 1974 and 1977. Hence, this increasing involvement of females in the drinking-driving problem is not a phenomenon unique to Canada.

TABLE 3.2

**Distribution of Blood Alcohol Concentration by
Driver Sex in Three Drinking-Driver Populations**

	<u>Blood Alcohol Concentration</u>				
<u>Roadside Survey</u> (Smith and Wolynetz 1975)					
	<u>Zero</u>	<u>1-49</u>	<u>50-80</u>	<u>81-150</u>	<u>over 150</u>
Male	5506 (77.2)	1151 (15.1)	448 (5.9)	423 (5.6)	95 (1.2)
Female	1131 (83.6)	139 (10.3)	39 (2.9)	33 (2.4)	11 (0.8)
<u>Driver Fatalities</u> ¹ (TIRF 1984)					
Male	4295 (37.8)	725 (6.4)	562 (4.9)	1793 (15.8)	3988 (35.1)
Female	1172 (63.2)	110 (5.9)	74 (4.0)	175 (9.4)	322 (17.4)
<u>Injured Drivers</u> ² (Rockerbie 1979)					
Male	64.8%	3.0	1.1	13.5	17.6
Female	80.4%	2.1	1.4	7.0	9.1

¹ Includes only drivers tested for alcohol, seven provinces, 1973-1982.

² Only percentages were available.

3.1.6 Other demographic characteristics. Marital status has often been assessed in relation to drinking drivers. Among those injured in crashes, fatally injured drivers, apprehended impaired drivers and drivers on the road, the most common status is "married". Unmarried single drivers often run a close second in terms of the representation in all groups. Divorced and separated drivers comprise a relatively small percentage of crash-involved drivers but are more likely than others to have been drinking. On the basis of the Grand Rapids data, Jones and Joscelyn (1978) determined that separated and divorced drivers with a BAC over 50 mg% were at slightly higher relative risk of crash involvement than were married and single drivers at the same BAC. They concluded that the evidence was not sufficiently strong to warrant considering marital status per se as a significant variable related to alcohol crash risk. Rather, the emotional state associated with separated and divorced individuals may be the more relevant risk factor. Marital status may also be related to age and sex; however, thus far, the nature and extent of these interactions have not been investigated.

The identification and categorization of occupational groups continues to be a subject of controversy. In the absence of agreement, only the most general comparisons can be attempted. Zylman (1972) reported that "low status" occupational groups were overrepresented among drivers with BACs over 80 mg%. Once again, occupational status is probably closely associated with age and sex, the interactions among which have not been examined in terms of alcohol use and driving. In summary, in the absence of more substantial data, there is no evidence of a strong relationship between occupational group and any of the populations of interest. A recent study in the U.S., however, indicates that the unemployment rate has a significant influence on the number of traffic fatalities (Partyka 1983). No suggestions were offered in the way of attempting to explain this influence.

Occupation is often associated with level of education, which is a much easier variable to define and measure. The 1974 Canadian roadside survey indicates that most drivers had at least some education at the high school level. Over 20% had some post-secondary schooling. These data also indicate that higher BACs are associated with less than post-secondary education. Borkenstein et al. (1964) also indicated that drivers who had completed high school were less likely to have high BACs. Wolfe (1975) noted that the less educated were more likely to have BACs in excess of 150 mg%. In any case, the evidence is not strong and there is little to convince one of a relationship between level of education per se and relative risk of alcohol-related accidents.

Again, one must consider possible interactions among education, age, sex and occupation that have not as yet been systematically studied. In addition, changing trends in education over the years may be obscuring any potential relationship with alcohol-crash risk.

3.1.7 Drinking status. It has been repeatedly demonstrated that individuals with alcohol-related problems are overrepresented among those apprehended for drinking-driving offences. Given the numerous and diverse definitions of "problem drinking" and "alcoholism", it is often very difficult to make comparisons among studies. In a recent review of a large number of studies, Vingilis (1983) states that the proportion of drinking-driver offenders considered to be alcoholics by different researchers ranges from 4% to 87%! Vingilis estimates that the proportion of drinking drivers who would most likely be considered alcoholics is 30-50%.

When one considers the preponderance of high BACs among those apprehended for drinking and driving (mean = 172 mg%), it should not be surprising that a large number of these individuals display signs of serious alcohol involvement. Heavy drinkers have a greater likelihood of reaching a high BAC on more occasions than light or moderate drinkers. If heavy drinkers also happen to drive, the frequency and amount of their drinking place them at higher risk of being apprehended. The BACs of apprehended drivers indicate that the selection and identification

of impaired drivers is highly biased in favour of those with the highest BACs, the very group most likely to exhibit alcohol-related problems.

Undoubtedly, high-volume drinkers contribute to the drinking driving problem. Zylman (1976), however, asserted that the role of the alcoholic in traffic accidents is exaggerated. By turning the table and examining the driving records of a group of alcoholics, Zylman discovered that they were not as bad as has been suggested. Many alcoholics had no violations or accidents on their records. Hence, Zylman suggested that it was not alcoholism per se that was responsible for accidents, but rather the misuse of alcohol was simply one manifestation of a more general category of deviant behaviour that is associated with accident involvement.

On the basis of the Grand Rapids data, Hurst (1973) found that daily drinkers had a lower relative risk of accident involvement at low BACs than infrequent drinkers. At a BAC of about 80 mg%, daily drinkers had a relative risk similar to the average sober driver. It was not until this group attained BACs in excess of 100 mg% that their relative risk approached that of other, less frequent drinkers. This evidence, however, produces somewhat of a dilemma. Heavy drinkers are often targeted as a high risk group, but in fact, at low BACs they actually have a lower risk of accidents. It would appear that there is a bias in identifying heavy drinkers as a population at high risk of accident in spite of at least some evidence to the contrary.

The 1974 Canadian Roadside survey data reveals that 80% of drivers reported drinking an average of 5 drinks or less per drinking occasion. Of those found to have a BAC in excess of 80 mg%, 39% reported consuming an average of more than 5 drinks on each occasion. If we accept 5 drinks per occasion as a somewhat crude definition of "problem" drinking (e.g., Cahalan et al. 1969), this evidence suggests that 61% of legally impaired drivers on the road can be considered to be non-problem drinkers. Admittedly, there are problems with this definition of problem drinking as well as the self-report measures of alcohol consumption. This analysis, however, is intended to illustrate that the majority of

impaired drivers on the road are not necessarily alcoholics or problem drinkers, but rather individuals who have consumed too much alcohol on this one occasion to drive "safely". The fact that problem drinkers are repeatedly identified as being overrepresented among groups of drinking drivers may be the result of the selection and identification procedures employed as opposed to a reflection of their risk of accident-involvement.

Whatever the "true" representation of alcoholics among the impaired driver population, there remains a substantial number of drinking drivers who are not alcoholics. It is this group of non-alcoholic drinking drivers that are probably most amenable to existing and future counter-measure programs. Perhaps it is unwise to concentrate solely on the alcoholic as the source of the drinking-driving problem and attend equally to the non-alcoholic drinking driver, for it is the behaviour of this latter group which may prove the easiest to change.

3.1.8 Driving record. An alternative approach to the impaired-driver problem is to examine the situation from the perspective of the "impaired problem-driver" (Simpson 1977). The investigation concerns the extent to which the convicted impaired driver population is composed of individuals who engage in poor driving behaviour and who also happen to use alcohol.

In a study of 1531 arrested impaired drivers in B.C., Mercer (1983) found 62% had 1 or more previous non-criminal traffic violations, 37.7% had 1 or more previous criminal driving convictions (including impaired driving) and 19.1% had had their licence suspended at one time. Denberg (1974) studied the driving records of over 5000 Ontario drivers convicted of impaired driving and found less than 1% with the single impaired driver charge as the only entry on their record. In comparing previous offences (excluding speeding), Raymond (1971) found Australian impaired drivers three times more likely than a control group to have received traffic citations and ten times more likely to have been charged with a "serious" traffic offence. Consistent with the notion of poor driving record, several researchers (Maisto et al. 1979; Perrine 1974) have

noted that this group has a higher rate of traffic accident involvement than expected among drivers in general.

This literature indicates that high-risk driving behaviours of the type that come to the attention of the police are overrepresented among persons convicted of impaired driving. There is also some evidence to suggest that drink-drive offenders who exhibit poor driving behaviour preceding their drinking-driving conviction, continue to do so afterwards (Maisto et al. 1979). Perhaps such individuals, by nature of their poor driving habits, are more likely to be apprehended. Nevertheless, this evidence in favour of the "problem-drivers who drink" hypothesis should be interpreted with considerable caution; the issue remains theoretical, and to some extent, an empirical question.

3.1.9 Personality characteristics. The suggestion that accident involvement may be related to personal maladjustment is one that has been repeatedly debated in many forums. Since the early 1960's, Selzer and his colleagues (Selzer 1961; Selzer and Payne 1962; Selzer et al. 1963, 1967, 1968) have argued that a large proportion of impaired drivers exhibit signs of psychological "pathologies". Although one must realize that there are numerous problems associated with the definition and measurement of psychopathology, the frequency with which symptoms of maladjustment are reported lends credence to the suggestion that "drunk driving" may be symptomatic of a deeper, more fundamental emotional problem. Drinking to excess may also be just one manifestation of a more complex personal or social problem. Driving is superimposed to produce yet another, perhaps more obvious problem.

The negative personality attributes that have been associated with drinking drivers include: hostility, alienation, low personal efficiency, inability to cope with stress and anxiety, irresponsibility, impulsiveness, and rebelliousness. Situational stress has also been associated with impaired driving incidents. The extent to which these personality traits contribute in a causal fashion to alcohol-related accidents and traffic crashes in general has not been determined. Awareness of the types of problems associated with these individuals is

an important aspect of our search for solutions in that it places us in a better position from which to understand and hopefully deal more effectively with offenders in efforts to reduce the incidence of impaired driving.

In a recent review of this area of research, Donovan, Marlatt and Salzberg (1983) indicate the high-risk driver profile that begins to emerge is that of an unsocialized, aggressive, impulsive individual who exhibits signs of emotional instability, low personal efficiency, lack of control over significant life events and a relative deficiency of skills to deal with stress and conflict. Long-standing personality traits and acute emotional states have been identified as factors contributing to accident involvement. The consumption of alcohol, which is often motivated by acute stress (e.g., Jung 1977), can interact with personality traits to produce greater risk. This interaction covaries with age and sex to produce an even more complicated situation.

Personality factors, although more difficult to measure in the various populations of interest, should not be ignored. The hypothesis that personal and situational emotional factors may play a significant contributory role in motor vehicle accidents may prove to be more useful and general than one that focuses exclusively on alcohol.

3.2 Recidivist Offenders

Recidivist offenders represent a particularly interesting group of drinking drivers. Given the rather low probability of being apprehended for impaired driving, anyone who manages two or more arrests must be outstanding in some fashion. One thing is apparent: recidivists are not responding favourably to court-imposed sanctions. This section examines the characteristics of this special group of offenders.

From the numerous studies surveyed, there is a general consensus that recidivists comprise about 15% (range=10-38%) of the population of impaired drivers. Homel (1981a), however, suggests that since the introduction of breath testing instruments, the proportion of recidivists

has been increasing. The very nature of their being arrested more than once demands that this group of offenders be examined more closely in an attempt to determine the unique characteristics of this special group.

Recidivists in general tend to be older individuals (i.e., over 21), to be from blue collar occupations, have more traffic offences on their records and have been involved in more traffic accidents (Denberg 1974; Reid and Harding 1978). The notion that the "killer drunk" (i.e., the alcoholic driver with numerous previous convictions for impaired driving) is responsible for a large number of traffic fatalities does not have a firm basis in the research literature. Two studies have specifically addressed this issue by examining the records of impaired drivers responsible for fatal crashes. Only 11.1% of impaired drivers responsible for fatal crashes were found to have previous convictions in Alberta (Bako, MacKenzie and Smith 1977); only 9% of culpable drinking drivers in New Zealand were recidivists (Bailey and Winkel 1981).

If one impaired driving conviction is viewed as presumptive evidence of problem drinking, two convictions must surely confirm any suspicions. A high BAC indicates the consumption of a large quantity of alcohol on one occasion. The individual may have simply exercised poor judgement on this occasion by attempting to drive. However, subsequent high BACs are evidence that excessive drinking is not unusual, and the individual is probably showing other signs of problem drinking as well. In fact, studies have shown that recidivists actually have higher BACs than first offenders (Bailey and Winkel 1981; Yoder and Moore 1973). The forms of psychosocial impairments that exist among alcoholic impaired drivers render this group unlikely to respond to traditional sanctions and countermeasure efforts (Selzer and Barton 1977).

If legal sanctions were effective in deterring offenders from repeating their crime, then one would expect the greatest impact to be evident within the first few years after conviction. The fact that most recidivists are charged within 2 years of their original conviction

(Reid and Harding 1978) indicates that these individuals are not responding favourably to court-imposed sanctions. The time between each successive reconviction for multiple offenders has also been shown to decrease from an average of 2 years for the second offence to eight months between the third and fourth reconviction (Maisto et al. 1979).

The few available studies on recidivist drinking drivers have two clear messages: 1) traditional sanctions are not effective in dealing with this population; and 2) these individuals are more deviant in both their drinking and their driving practices than impaired drivers as a whole.

There are some methodological problems in the work on recidivists which cannot be ignored. The information available on recidivist offenders has been obtained from cross-sectional studies comparing first and multiple offenders at the same point in time. By definition, recidivists were once first offenders; hence, any discrimination between the two groups is confounded by the time intervening between the first and subsequent offence. There is no indication as to whether the characteristics which distinguish recidivist offenders were acquired or exacerbated subsequent to the first offence or whether, in fact, they existed at the time of the first conviction. In addition, we have no follow-up information on the characteristics of convicted offenders who have not recidivated. Only longitudinal, prospective studies that follow offenders over a period of years will address these issues. At the time of the first conviction it would be most advantageous to be able to distinguish single offenders from those most likely to recidivate. By identifying the highest risk groups before they commit a subsequent drink-drive offence, sanctions and countermeasures could be designed for and applied to this group in an effort to reduce recidivism.

3.3 Summary

Research studies indicate that drinking drivers are a very heterogeneous group; many of those who drive and consume alcohol probably combine these activities, at least occasionally. Those who are identified as

"drinking drivers" by virtue of some adverse consequence of their behaviour (arrest or accident) represent the proverbial tip of the iceberg. The actual incidence of drinking and driving, as indicated by roadside surveys, far exceeds that evidenced in the apprehended and accident-involved populations.

In comparing different groups of drinking drivers, it is important to remember that descriptions of characteristics are based on static, cross-sectional representations during a brief period of time. In reality, drinking and driving is only a temporary state or condition, which individuals continually enter into and exit from, only to reenter again at some future time. The drinking driver rarely remains in that state long enough to be identified, let alone measured, analyzed, and profiled. Hence, descriptions of drinking drivers based on static comparisons hide as much as they reveal. This approach cannot capture the dynamic nature of drinking-driving behaviour, nor does it offer much insight into motivations that underlie this behaviour. Descriptions of offenders do not tell how an individual came to be identified and they can tell nothing of drinking drivers who escape detection.

Comparisons of different populations of drinking drivers do offer some insight into the characteristics of those who have accidents or who are arrested for alcohol-related driving offences. Among main findings summarized in this section are the following:

- o High BACs are highly overrepresented among accident-involved and apprehended drinking drivers compared to those using the road on nighttime weekends.
- o Persons aged 20-34 years appear most frequently in all groups of drinking drivers. Younger drivers aged 16-19 years account for 23% of fatalities, 18% of injuries, 15% of those at risk, and 11% of those arrested for alcohol-impaired driving. Middle-aged drinking drivers are found more often in the at-risk and arrested groups than among those involved in accidents.
- o With respect to gender, males continue to predominate in all groups of drinking drivers, most so among those arrested. The one significant trend in drinking-driving statistics, however, is the increasing

proportion of women among those at risk and those fatally injured in road accidents.

- o The interaction of BAC and age factors is complex. On average, younger and older drivers drink less often and lower amounts. Drivers aged 16-19 years, however, are at much higher risk of accident involvement when they do consume alcohol than other drivers. Drivers aged 25-44 years are most likely to have been drinking and most likely to have a BAC over 80 mg%.
- o Concerning marital status of drinking drivers, those separated and divorced may have a higher risk of accident involvement than married and single drivers --a finding suggestive of the influence of emotional states on accident risk.
- o Occupational status and education--variables highly confounded by age and gender--are not strongly associated with accident risk.
- o Present knowledge indicates that a substantial proportion of drinking drivers involved in accidents and of those arrested for alcohol-related driving offences are "problem drinkers" or "alcoholics". Precise estimates are not possible. Nonetheless, the need for effective programs for these groups of drinking drivers is clear.
- o Among those convicted of alcohol-related driving offences are many drivers with poor driving records. A few studies have produced evidence indicating that one high-risk subgroup includes "problem drivers" who also drink. This suggests the need for true driver-improvement programs, beyond licence suspension per se.
- o Accident-involved and apprehended drinking drivers may frequently evidence personality traits and other personal problems that contribute to their dangerous behaviour. Such factors may exacerbate tendencies to drink excessively, to drive recklessly, and to combine the two. These factors represent underlying conditions or "root causes" that have to be addressed in "rehabilitating" offenders.

The information contained in this section fails to provide adequate answers to all the questions we had posed at the beginning of Section 3.1. Nevertheless, given the low probability of arrest and the chance nature of traffic accidents, the available information does tell us a great

deal about persons who actually are identified as drinking drivers. This information is particularly relevant when compared with drinking drivers from roadside surveys who represent a group that was not identified through adverse consequences as a result of their behaviour. In very general terms, accident-involved and apprehended drinking drivers reveal a high level of deviance in either their drinking habits, driving style and/or other aspects of their social and personal behaviour. One must be careful, however, to avoid over-generalization because even if a characteristic trait or behaviour is highly represented among drinking drivers, it does not mean that all such individuals fit that mold. Despite the repeated referral in this section to prominent characteristics, drinking drivers are, in effect, a very heterogeneous group. It is also impossible to predict with any certainty the relative risk of an individual based on the prominent characteristics of a group.

4.0 THE RELEVANCE OF KNOWLEDGE ABOUT DRINKING DRIVERS

As with many other social and legal problems, efforts to reduce alcohol-related road accidents have focused on "doing something about it" rather than on "understanding its nature and magnitude". When public concern over drinking and driving increases, the emphasis is on action, not research, even when a limited knowledge base does not support the development and implementation of effective, cost-efficient programs. When public concern subsides, or turns elsewhere, the priority of increasing knowledge about drinking-driving problems sinks even lower. This chronic situation has represented a "Catch-22" for those responsible for creating, processing, and communicating information relevant to dealing with the problem.

Part of the researcher's dilemma may be attributed to a failure in communicating the need for and the relevance of information in relation to policy and programs in this field. This section aims to redress the balance. We discuss the relevance of knowledge about drinking drivers for the criminal justice system in its dealing with persons arrested and convicted of alcohol-related driving offences. The topic is discussed in terms of the purpose and principles of criminal law and the traditional aims of sentencing. These functions include deterrence, retribution, incapacitation, and rehabilitation. This discussion expands that in Section 2.0. Its general purpose is to establish why efforts to advance knowledge in this area are justified and how such knowledge could serve in developing, implementing, and refining programs to reduce the alcohol-crash problem.

4.1 Background and Context: Alcohol-impaired Driving and the Criminal Law

In many respects, criminal law is an expression of a society's moral values and ethical principles. In a growing, changing society, these values and principles may change, or evolve, or have new areas of application. Criminal law is sometimes modified or extended to reflect changes or to deal with new developments. For example, technological

innovations as well as the reassessment or reaffirmation of values related to prostitution have placed demands on lawmakers to respond by revising the Criminal Code.

Drinking and driving (or, more precisely, alcohol-impaired driving), is another example of a social problem with legal implications for which revision of the Criminal Code has become an issue. In contrast to such offences as murder, theft, and other acts traditionally considered and accepted as "crimes", alcohol-impaired driving is a relatively recent problem brought about by the advent of the motor vehicle. As people came to appreciate the magnitude and extent of the alcohol-crash problem, drunk driving (not necessarily the act of driving after drinking) was increasingly viewed as a dangerous behaviour that threatened the lives and safety of other road users--and for which legal and other control measures were needed. Alcohol-impaired driving offences were included in the Criminal Code in order to punish people who committed these offences, to deter others from engaging in such behaviour, and, ultimately, to reduce the human and economic losses associated with drinking-driving problems. The criminal law concerning alcohol-impaired driving in many countries has been periodically revised to close loopholes, to incorporate advances in the technology of chemical testing for blood alcohol concentration, and to increase penalties for those convicted of the offence. For example, in Canada in 1968, the Criminal Code was revised to include a new, so-called per se section, which made it an offence to operate or to have care or control of a motor vehicle with a BAC exceeding 80 mg%. This and other provisions facilitated enforcement of alcohol-impaired driving laws and to some extent streamlined the process of adjudication. But there is little evidence internationally that the criminal law, the criminal justice system, or legal approaches in general have had much effect on the magnitude of the alcohol-crash problem (Ross 1982; Gusfield 1981).

Over the decades, social concern and social action have gone through cycles of concern and seeming complacency (Douglass 1982). The present social climate is one of intense concern, for which citizen activist groups known best by their acronyms--e.g., MADD, RID, PRIDE, CAID, PAID,

ADD--are largely responsible. Most of these groups were formed and joined by victims of drunk drivers, people who suffered direct and personal loss from alcohol-related road accidents. Their anger, conviction, and commitment have done far more to motivate renewed action than hundreds of reports on research published during the same time.

Following traditional approaches to dealing with alcohol-impaired driving and alcohol-related road accidents, these and other groups, organizations, and private citizens have focused on the role of the criminal justice system and criminal law as "the solution" to the problem. In particular, they have demanded changes both in the administration of the law and in alcohol-impaired driving statutes themselves. In their desire to have persons who drive while impaired by alcohol caught more often and punished more severely, they advocate such measures as increased enforcement, especially random roadside checks; mandatory jail sentences for all offenders; larger fines; court-ordered prohibition of driving; etc. At times, the primary motivation underlying the advocacy of these and other specific measures and sanctions appears that of vengeance, not retribution. Moreover, these law-based "solutions" are often put forward without qualification or discrimination, for example, without careful consideration of the range in seriousness of alcohol-related driving offences. The periodic call for one-year mandatory minimum jail sentences for all persons convicted of alcohol-impaired driving is a particularly extreme example. That "solution" does not discriminate among offenders or the consequences, if any, of their act of alcohol-impaired driving.

Experts in the drinking-driving field have opposed many of the recommended actions with arguments based on scientific studies of the effectiveness, and cost-effectiveness, of large-scale, law-based approaches. Legal approaches based on the theory of general deterrence simply have not produced hoped-for results; measures of drinking-driving problems have indicated, at best, relatively small and short-lived gains (Ross 1982). More severe penalties have been found to increase recidivism among certain types of offenders (Homel 1980). Certain proposed sanctions for alcohol-related driving offences may even violate accepted

principles of the application of criminal law; for example, one-year minimum mandatory jail sentences may interfere with individual freedom to an extent far beyond that necessary to achieve the purpose of criminal law. An international, multi-disciplinary panel of experts recently raised the issue of whether it was appropriate, or even necessary, to deal with all alcohol-impaired driving offences in criminal law (Donelson 1983). Some even recommended removing statutes that concerned alcohol-impaired driving (for example, Sections 234 and 236) from the Criminal Code and placing them in provincial Highway Traffic Acts instead. These questions relate to the more general issue of the proper scope of the criminal law and, more specifically, to the boundary between criminal and civil law (Government of Canada 1982, pp. 37-54).

We believe that the use of the criminal law and the criminal justice system in dealing with the problem of alcohol-impaired driving should be reexamined carefully and thoroughly in the context of the "doctrine of restraint" urged by the Law Reform Commission, the Ouimet Committee, and many others (Government of Canada 1982, pp. 41-43). There are ample grounds, beyond expert opinion, for believing that such a review would be timely and valuable in the overall social response to the drinking-driving problem. The following discussion deals with issues concerning the use of criminal law in this area. It should not be construed as an argument for "decriminalizing" alcohol-impaired driving offences.

One reason for considering such a comprehensive reassessment of criminal law in relation to alcohol-related driving offences is the great disparity between (1) the "symbolic and solemn condemnation of violations of 'core values'", which Criminal Code statutes concerning alcohol-impaired driving represent, and (2) actual practices in the criminal justice system dealing with the offences and actual beliefs, attitudes, and practices of the general public related to alcohol-impaired driving as a behaviour.

As a starting point, we must recognize the fundamental difference between doing intentional harm and being responsible for accidental harm

both to property and person. This is particularly relevant to offences involving the operation of a motor vehicle.

As Homel (1981b) pointed out:

Traffic offences do not fit easily into the general criminal justice system since there is either harm without intention or intention without harm, or neither harm nor intention (p. 270).

If the judicial attitude towards "traffic offences"--be they "crimes" or "contraventions of a section" of a provincial Motor Vehicle Act--are an accurate reflection of how seriously society regards these kinds of offences, then even "drunk driving" is considered and treated more as a violation of a traffic regulation (a "minor" offence) than a "real" crime (Klein and Waller 1970; Haddon et al. 1964; Gusfield 1981). Despite increased concern about "drunk driving", it appears that the general public does not consider alcohol-impaired driving as a serious crime nor the alcohol-impaired driver as a criminal.

A recent survey conducted by Goldfarb Consultants (1983) offers support for this observation. For example, about half of the respondents described "a person convicted of drunk driving" as "irresponsible" (57%) and "careless" (43%), but only 14% labelled such a person as "criminal" (Table 4.1). According to the percentage of respondents describing various acts as "very offensive", drinking and driving ranked well below child abuse, rape, murder, and arson and closer to "cheating on your spouse/boyfriend/girlfriend". A lower percentage of respondents who said they had driven after drinking too much termed drinking and driving "very serious" compared to other respondents (Table 4.2). Tables 4.3 and 4.4 related to the "social stigma" attached to being convicted for various offences, including "drunk driving" and "impaired driving". Only about half of the respondents indicated that their "image would suffer a great deal" if convicted of these offences. More than half said that the likelihood of not being forgiven for these behaviours was "a little likely" or "not likely at all".

TABLE 4.1VERBAL DESCRIPTION OF A CONVICTED DRUNK DRIVER

<u>Words Which Describe A Person Convicted Of Drunk Driving</u>	% of Respondents		
	<u>Total</u>	<u>Drink alcohol</u>	<u>Those who have driven after having too much to drink</u>
Irresponsible	57	58	54
Careless	43	41	34
Dangerous	34	33	25
Got what they deserved	33	34	36
Stupid	33	35	33
Criminal	14	12	10
Silly	12	13	16
Crazy	10	10	8
Unlucky	8	8	11
Victimized	3	2	1

SOURCE: GOLDFARB CONSULTANTS (1983)

TABLE 4.2

RELATIVE OFFENSIVENESS OF VARIOUS ACTIONS

	% saying 'very offensive'		
	Total	Drink alcohol	Those who have driven after having too much to drink
Child abuse	97	98	98
Rape	96	98	96
Murder	96	98	96
Arson	91	92	93
Abuse of animals	85	84	86
Robbery	83	84	82
DRINKING AND DRIVING	77	76	67
Cheating on your spouse/boyfriend/ girlfriend	69	67	61
Suicide	66	66	61
Picking your nose in public	61	63	61
Rudeness	57	58	60
People who litter the streets/ parks	57	59	64
Tailgating	56	55	57
People who lie	54	52	53
Butting into line-ups	53	58	59
Cheating on tax returns	49	46	38
Pornography	49	44	26
Using marijuana	48	43	34
Unemployment levels	48	49	50
Smoking in a no-smoking area	48	47	43
Inflation	41	39	39
Homosexuality	41	38	40
Fishing or hunting out of season	41	43	43
Abortion	40	36	30
Prostitution	40	35	24
Lying at Customs	33	27	21
Not wearing a seat belt	21	22	21
Obesity	18	18	20
Smoking tobacco	18	17	17
DRINKING ALCOHOLIC BEVERAGES	9	3	3

SOURCE: GOLDFARB CONSULTANTS (1983)

TABLE 4.3

RELATIVE AFFECT OF VARIOUS ACTIONS ON A PERSON'S IMAGE

<u>Amount A Person's Image Would Suffer If He/She Were Convicted Of...</u>	% saying 'a great deal'		
	<u>Total</u>	<u>Drink alcohol</u>	<u>Those who have ever driven after having too much to drink</u>
Child abuse	93	93	95
Rape	92	93	94
Breaking and entering	66	63	57
DRUNK DRIVING	57	56	54
Embezzling money	55	55	50
IMPAIRED DRIVING	50	50	42
Prostitution	47	46	40
Abusing an animal	45	46	51
Shoplifting	39	37	35
Being convicted of cheating on their income tax	24	21	19
Having marijuana	23	14	9
Lying to Customs	20	15	10
Fishing/hunting out of season	16	15	11
Smoking in a no-smoking area	9	8	7

SOURCE: GOLDFARB CONSULTANTS (1983)

TABLE 4.4

RELATIVE LIKELIHOOD OF BEING NOT FORGIVEN FOR VARIOUS ACTIONS

	% saying 'a little likely'/ 'not likely at all'		
	<u>Total</u>	<u>Drink alcohol</u>	<u>Those who have ever driven after having too much to drink</u>
<u>Likelihood Of Not Forgiving Someone For:</u>			
Rape	88	87	86
Child abuse	88	88	87
Breaking and entering	72	68	64
Abusing an animal	66	64	65
DRUNK DRIVING	63	60	50
IMPAIRED DRIVING	57	53	45
Embezzling money	57	53	49
Prostitution	50	44	34
Having marijuana	35	26	20
Fishing/hunting out of season	35	29	30
Lying to Customs	31	24	19
Being convicted of cheating on their income tax	30	24	19
Shoplifting	29	22	17
Smoking in a no-smoking area	23	17	15

SOURCE: GOLDFARB CONSULTANTS (1983)

These findings also indicate that respondents were sensitive to terms used in the survey, for example, "drinking and driving", "drunk driving", and "impaired driving". The results of the survey may have been different, and more informative, if such terms had been carefully defined for respondents.

Other evidence indicates that the general public's attitude toward alcohol-impaired driving and persons convicted of alcohol-related driving offences may be less than draconian. In an opinion survey conducted for Transport Canada and reported in part by Wilson and Jonah (1984), over one-half of all respondents who said that they consumed alcohol also said they they drove after drinking. Fourteen percent of self-reported drinkers said that they drove while impaired. Given that the great majority of drinkers cannot accurately estimate their blood alcohol concentration (BAC) and cannot relate subjective feelings of alcohol's effects to BAC (Beirness and Donelson 1983), it is likely that a much higher percentage of drinkers actually drive while impaired or with BACs exceeding the statutory limit of 80 mg%. Respondents' attitudes toward impaired driving countermeasures were measured according to the strength of agreement or disagreement with various enforcement methods, laws, and penalties. The "countermeasure" receiving the lowest degree of agreement was "jail sentence" upon first conviction of an offence.

Surveys done at roadside have consistently found that an average of 6-7% of drivers on weekend nights have blood alcohol concentrations exceeding the statutory limit of 80 mg%. As documented in Section 3.0 and Appendix A, about 20% of this population drive after drinking. If persons with low BACs were not included in "nondrinking categories" (e.g., BACs greater than zero and less than 20 mg%), the percentage of drinking drivers could range as high as 40% during these times.

The reluctance, whether overt or covert, of the general public (and even of those who function in the criminal justice system) to consider alcohol-impaired driving as "criminal behaviour" probably stems from their own willingness to engage in this behaviour and their occasional

commitment of an alcohol-related driving offence. People who commit these offences--whether detected, arrested, and convicted, or not--represent a more complete cross-section of the general population than people who commit "real" crimes. Ross (1960) described as "folk crime" offences that, though included in criminal law statutes, were generally considered normal, socially acceptable behaviour. The majority of survey respondents may rank alcohol-impaired driving as a relatively serious offence. Other research indicates that self-reported attitudes, beliefs, and practices are at variance with actual behaviour. This discrepancy is attributable, at least in part, to what Homel (1981b) refers to as an "us and them" mentality. People will deny that they themselves consume enough alcohol to put them over the legal limit; they insist that they are not impaired; they claim they are experienced drivers; and, most of all, they do not accept that they are "criminals".

The contrast of alcohol-impaired driving as a "real crime" as symbolized in the Criminal Code and the actual attitudes, beliefs, and practices of people outside and inside the Criminal Justice System is both striking and disturbing. This issue and its ramifications for dealing effectively with drinking-driving problems in society has been discussed at length by Gusfield (1981). The apparent discrepancy between criminal law and widespread acceptance of drinking-driving as a social norm also has great implications for how to deal with people convicted of alcohol-related driving offences. In this context, one explanation for why persons convicted of these offences are neither considered nor treated like "criminals" is the great diversity of people who engage in drinking-driving behaviour as well as the wide range of consequences that result from such behaviour. Most people do not view drinking and driving in the distinct, dichotomous terms of law (i.e., legal or illegal). Drinking and driving varies along a continuum of the perceived gravity of the offence. At one extreme is the drinking driver with a BAC in excess of the legal limit who is performing competently and safely, causing no harm and placing no one in any obvious danger. At the other extreme is the obviously impaired individual, driving in a reckless and clearly dangerous manner, perhaps causing death and injury

to others as a consequence of his behaviour. It is difficult to rationalize a system that tends to treat such different behaviours in a manner not corresponding to such extremes. It is not difficult to understand why the system treats the great majority of offenders "lightly"--most offenders commit the least serious of alcohol-impaired driving offences!

The psychology of attempting to deal with drinking and driving within the criminal justice system has produced a "social schizophrenia" (Donelson 1984). Alcohol-impaired driving is defined as a crime and dealt with through the Criminal Justice System, yet offenders are not treated as "criminals". Society is obviously reluctant to require severe sanctions for an act that is not always clearly "criminal" in our usual conceptualization of the term. Even in Sweden, a country that long treated offenders more harshly than in North America, where jail sentences are mandatory for most first offenders, most offenders are sent to "open" jails in order not to expose them to the "real criminals" of society (Dr. Roger Bonnichsen, National Police Board, personal communication [see Donelson and Beirness 1984, pp. 96-97]). As Ross (1983) reported, categories of reasons for excepting certain offenders from jail sentences have increased over time, and consideration is now being given to do away with the 30-day minimum jail term for first offenders with BACs exceeding 150 mg%. Thus, even in Sweden, which has for so long used its criminal justice system to deal with alcohol-related driving offences, the appropriate scope and role of criminal law in this area has begun to receive attention.

In Canada, the present level of public awareness about drinking-driving is acute--largely the result of efforts by citizens' groups, but also due to national media campaigns and local or regional enforcement "blitzes". In addition much attention has been focused on proposed changes in the Criminal Code regarding alcohol-related driving offences, another example of how central the criminal law and the criminal justice system has been in dealing with drinking-driving problems. Given these conditions, it is highly unlikely, to say the least, that much if any consideration will be given to "decriminalizing" alcohol-impaired

driving offences, even those of a relatively minor nature. We are left with another issue:

Given the diversity of people who engage in drinking-driving behaviour and the wide range of consequences thereof, how can the criminal law be best employed to deal effectively with alcohol-impaired driving and, by extension, the deaths, injuries, disabilities and other losses due to alcohol-related road accidents?

We believe that this question can be best addressed in light of the purpose of the criminal law and the principles to be applied in achieving that purpose, in the context of dealing with drinking-driving problems in Canada. Full treatment of this issue extends beyond the scope of this report, which deals with questions of more limited scope. We also believe, however, that resolution of the more general issue is critical if the criminal justice system is to play an effective role in dealing with drinking and driving as a social problem with legal implications. Therefore, as a starting point for those who wish to consider the broader issue, and as a basis for discussing the more specific issues raised in this report, we refer to a statement of the purposes and principles of the criminal law outlined in "The Criminal Law in Canadian Society" (Government of Canada 1982). This statement provides the rationale and guidance necessary for considering both general and specific issues related to the involvement of the criminal justice system in the problems of drinking and driving. Table 4.5 reproduces this statement. We have highlighted key phrases that relate directly to the topics considered here. They raise issues that must be dealt with in relation to alcohol-impaired driving as a criminal offence.

It is the purpose of the criminal law "to deal fairly and appropriately" with behaviour that "causes or threatens serious harm". Therefore, it is important that society determines: 1) which types of drinking-driving behaviour actually threaten harm; and 2) how to deal in a fair and reasonable manner with these very diverse forms of behaviour.

TABLE 4.5

PURPOSES AND PRINCIPLES OF CRIMINAL LAW

STATEMENT OF PURPOSE AND PRINCIPLES

Recognizing that:

In the Charter of Rights and Freedoms, Canada has guaranteed certain rights and freedoms consonant with the rule of law and with principles of justice fundamental to a free and democratic society;

Canada has, in addition, undertaken obligations to maintain certain standards with respect to its criminal justice system;

The criminal law is necessary for the protection of the public and the establishment and maintenance of social order;

The criminal law potentially involves many of the most serious forms of interference by the state with individual rights and freedoms; and

Criminal law policy should be based on a clear appreciation of the fundamental purpose and principles of criminal law;

It is appropriate to set forth a statement of purpose and principles for the criminal law in Canada.

PURPOSE OF THE CRIMINAL LAW

The purpose of the criminal law is to contribute to the maintenance of a just, peaceful and safe society through the establishment of a system of prohibitions, sanctions and procedures to deal fairly and appropriately with culpable conduct that causes or threatens serious harm to individuals or society.

Principles to be Applied in Achieving this Purpose

The purpose of the criminal law should be achieved through means consonant with the rights set forth in the Canadian Charter of Rights and Freedoms, and in accordance with the following principles:

- (a) the criminal law should be employed to deal only with that conduct for which other means of social control are inadequate or inappropriate, and in a manner which **interferes with individual rights and freedoms only to the extent necessary for the attainment of its purpose;**
- (b) the criminal law should clearly and accessibly set forth:
 - (i) the nature of conduct declared criminal;
 - (ii) the responsibility required to be proven for a finding of criminal liability;

TABLE 4.5 continued .

- (c) the criminal law should also clearly and accessibly set forth the rights of persons whose liberty is put directly at risk through the criminal law process;
- (d) unless otherwise provided by Parliament, the burden of proving every material element of a crime should be on the prosecution, which burden should not be discharged by anything less than proof beyond a reasonable doubt;
- (e) the criminal law should provide and clearly define powers necessary to facilitate the conduct of criminal investigations and the arrest and detention of offenders, without unreasonably or arbitrarily interfering with individual rights and freedoms;
- (f) the criminal law should provide sanctions for criminal conduct that are related to the gravity of the offence and the degree of responsibility of the offender, and that reflect the need for protection of the public against further offences by the offender and for adequate deterrence against similar offences by others;
- (g) wherever possible and appropriate, the criminal law and the criminal justice system should also promote and provide for:
 - (i) opportunities for the reconciliation of the victim, community, and offender;
 - (ii) redress or recompense for the harm done to the victim of the offence;
 - (iii) opportunities aimed at the personal reformation of the offender and his reintegration into the community;
- (h) persons found guilty of similar offences should receive similar sentences where the relevant circumstances are similar;
- (i) in awarding sentences, preference should be given to the least restrictive alternative adequate and appropriate in the circumstances;
- (j) in order to ensure equality of treatment and accountability, discretion at critical points of the criminal justice process should be governed by appropriate controls;
- (k) any person alleging illegal or improper treatment by an official of the criminal justice system should have ready access to a fair investigative and remedial procedure;
- (l) wherever possible and appropriate, opportunities should be provided for lay participation in the criminal justice process and the determination of community interests.

Another issue involves the extent to which legal solutions to the drinking-driving problem can, and perhaps can excessively, interfere with individual rights and freedoms. To what extent are social controls necessary in order for the Criminal Law to attain its stated purpose, particularly in terms of safety and protection of the public from harm?

According to the stated principles, sanctions should be related to the "gravity of the offence and the responsibility of the offender". This implies that driving with a BAC in excess of the legal limit without apparent impairment of abilities or adverse consequences should be dealt with less severely than impaired driving that results in death or injury to others. What measures must be taken to ensure that the public is protected from a reoccurrence of the offence by an individual? How can the criminal justice system most effectively use sanctions to deter others from committing similar offences? Is general deterrence, in fact, an attainable goal?

The criminal law also provides for the rehabilitation of offenders in order that they may be reintegrated into the community. Those with identifiable medical or psychological problems should receive treatment for their affliction. If the cause of a problem is not eliminated, the symptoms will only reappear, no matter what retributive sanctions are imposed. Drinking drivers who exhibit signs of alcohol abuse should be directed to treatment. Can the system and society accept this goal and accommodate these offenders?

Sentences for the same offence in similar circumstances should be roughly equivalent. In drinking and driving offences, what are the relevant circumstances--the BAC of the offender, the nature of pre-arrest behaviour, or the consequences of the act? What constitutes the most serious form of this offence? Is it even possible to equate offences?

Finally, in sentencing, the "least restrictive alternative" should be given preference in light of the circumstances. The offender must be punished but not unnecessarily severely. If no obvious or threatened

harm is involved in an impaired-driving incident, what would be the least restrictive alternative in this case that would be adequate to serve the purposes of criminal law. For example, would merely appearing in court be adequate for some individuals, without imposing further sanctions?

The purpose of criminal law and the principles that guide its application have direct relevance for the manner in which alcohol-impaired driving is dealt with in the Criminal Justice System. They provide at least a general perspective from which to consider the following specific issue: "How can the criminal justice system deal fairly and appropriately with the diversity of individuals and the wide range of drinking-driving conduct that brought these persons into conflict with the law?" It is our strong conviction that determining how society can deal most effectively with drinking-driving as a social problem in accordance with the purposes and principles of criminal law depends greatly on information about the characteristics of offenders and how these characteristics interact with sanctions to accomplish these goals.

4.2 The Relevance of Information on Drinking Drivers in Terms of Traditional Goals of Sentencing

Below we examine requirements for information about apprehended and convicted drinking drivers in relation to the intended functions of sentencing--deterrence, retribution, incapacitation, and rehabilitation--in an attempt to determine how the legal system might best accomplish its objectives in this area.

4.2.1 Deterrence. The essence of the theory of deterrence is captured quite aptly by Ross (1975) in the following quotation:

Throughout the world, important hopes and huge investments currently rest on the proposition that by threatening the drinking driver with criminal punishments, the legal system can deter at least a significant portion of the driving population from combining driving with the consumption of alcohol. (p. 663)

This proposition is based largely on common sense. Many people rely on this rationale when advocating harsher penalties for drinking drivers. It is, therefore, imperative that the deterrence hypothesis be examined in relation to the pertinent scientific evidence concerning its validity and efficacy in reducing alcohol-related driving problems.

Deterrence can be divided into two types. General deterrence refers to the influence of a threatened punishment on preventing potential offenders in the general population from engaging in the prohibited behaviour through a desire to avoid punishment. Specific deterrence refers to the effectiveness of the penalty imposed upon an offender in preventing a recurrence of the prohibited act in the future. Ross (1982) also refers to simple deterrence, the short-term component of general deterrence, which serves as one basis for evaluating current policies on drinking and driving.

The efficacy of deterrence is a function of three interacting components: perceived certainty, severity, and celerity (or swiftness) of punishment if a law is broken. The theory of deterrence predicts, therefore, that as the perceived risk of being apprehended, the severity of the penalty, and the swiftness with which it is administered increases, the greater will be the deterrent effect. Those who only advocate harsher penalties to increase deterrence are overlooking two other very important aspects of the model. It seems unlikely, based on experience to date, that severe penalties alone will deter a significant proportion of the drinking-driving population if potential offenders do not believe that they will be caught or punished. Increasing the perceived likelihood of apprehension and decreasing the delay between arrest and punishment are also key components that determine the overall efficacy of the deterrence model.

Assessing the usefulness of deterrence in reducing the frequency of alcohol-impaired driving and alcohol-related road accidents is a task not readily accomplished. To begin with, deterrence is a theoretical construct conceived to represent an inherently unobservable phenomenon. It is also used as an hypothetical explanation for certain behaviour (or

more accurately, the lack thereof) rather than a description of the behaviour itself. Therefore, that a behaviour does not occur is necessary, but not sufficient, to infer deterrence.

Using quasi-experimental designs and interrupted time-series analyses, Ross (1975, 1982, 1983) has studied the general deterrent effect of changes in drinking-driving laws in several European and Scandinavian countries. A review of this research reveals that tougher laws and increased enforcement of drinking-driving laws sometimes lead to a reduction in alcohol-related crashes. This effect, however, is only temporary; in time, the magnitude of the problem returns to its baseline level. Ross hypothesized that when drinking-drivers realize that they overestimated of the probability of apprehension, they adjust their behaviour accordingly. Hence, the problem reemerges and attains its original magnitude. These results suggest that the "conclusion that the international faith in the efficacy of Scandinavian laws on drinking and driving is without firm foundation" (Ross 1975).

In a recent review of the Scandinavian situation, Ross (1983) notes that roadside surveys in these countries find much fewer drivers with BACs in excess of the statutory limit of 50 mg% compared to, for example, Canada. Officials in these countries claim that this is evidence of the success of their strict deterrent measures. Ross acknowledges their apparent effectiveness in this regard, but he also points out that there remains a large proportion of accidents in these countries that involve alcohol. Hence, the deterrent effect appears to operate selectively. Drinking drivers who are most likely to crash are not deterred, whereas the less deviant group who are least likely to crash seem to change their behaviour in response to new measures.

In his study of the effect of specific deterrence, Homel (1980, 1981a) concluded that no one sanction was universally effective in reducing recidivism. In fact, the more severe the punishment, the less of a deterrent effect it appeared to have. Deterrence was not deemed a useful explanation of the behaviour of high-risk groups who engage in impulsive action and who lack foresight for consequences of actions.

Deterrence appeared to operate selectively on different groups of persons within the population. Some individuals are relatively impervious to penalties whether threatened or applied. Homel (1980) indicates that "high-risk" groups include those with previous convictions for driving while disqualified, young "criminal" offenders, and older alcoholics.

By only affecting persons considered at "low risk" of committing a drinking-driving offence or being involved in an alcohol-related crash, the deterrence approach is of limited value. Knowing the characteristics of persons least likely to be deterred would allow for the development and utilization of alternative strategies specifically aimed at high-risk groups. Simply referring to this group as "high-risk" individuals is inadequate and does not lead to solutions. It is necessary to determine the characteristics of this group (or groups) in order to distinguish them from "low-risk" groups. Approaches to deal with high-risk groups may well include the criminal justice system, coupled with more comprehensive plans and programs related to sentencing.

Knowledge about the characteristics of drinking drivers might also prove valuable in terms of another aspect of deterrence. This concerns the general deterrent effect of mass media campaigns. This might be particularly important when the message is intended to inform the public of changes to existing laws. Presently, messages with potential deterrent value are presented to the public at large. All potential offenders are covered by the same umbrella campaign. But if the above discussion and conclusions about law-based measures are applicable to this area as well, then such messages are likely to have their impact on those those least likely to engage in the proscribed behaviour. Perhaps more detailed and focused messages could be developed to target particular high-risk groups. Various media could be employed to ensure that these groups received exposure to the message. In this manner, the characteristics of special groups would play a vital role in determining which groups to target and how this could be best accomplished.

4.2.2 Retribution. One of the underlying philosophies of our legal system is that persons convicted of a blameworthy act should be punished for their behaviour. However, as a matter of policy, we also hold that sanctions should be commensurate with the seriousness of the offence and the circumstances in which it occurred. The penalty imposed should also provide sufficient deterrence to reduce the possibility of a subsequent offence. There is also a general consensus that the sentence must fit not only the crime, but also the offender. In this respect, the characteristics of offenders can provide relevant and useful information in determining guidelines for sentencing policy.

In most jurisdictions, the law provides for a wide variety of sentencing options for drinking drivers including incarceration, fines, licence disqualification, vehicle impoundment, probation, community service, and educational or rehabilitation programs. To a great extent, society relies on judicial discretion to ensure that sanctions are applied in a fair and just manner to all offenders. Judges have been the target of a good deal of criticism for what is perceived by activist groups as leniency in sentencing practices. Of the sparse and highly selective information available about the sentences currently imposed upon drinking-driving offenders, the consensus in the U.S. is that the full range of sanctions is rarely employed and that the sanctions typically imposed are considerably less severe than those stipulated by law (NHTSA 1983). Judges also differ in their perspective on the problem and their interpretation of the law, which leads to variations in the severity of sanctions according to jurisdiction (Homel 1982). Consequently, in 1982, twenty-two states plus the District of Columbia revised their drinking-driving legislation, mandating more severe sanctions or plugging loopholes to ensure existing sanctions are more consistently imposed. Similar action is being advocated or considered in Canada and other countries.

In light of recent demands for more severe punishments for drinking drivers, it is important that we demonstrate a reasonable and rational basis for sentencing the offender. Guidelines indicating the type and severity of sanction most appropriate for certain types of offenders can

only be determined through research examining the characteristics of offenders, the type and severity of sanctions imposed, and the rate of recidivism. An initial effort to conduct this kind of research has been completed.

Homel (1980, 1981a, 1982) studied the judicial sentences imposed on a large, heterogeneous sample of drinking drivers in New South Wales in an effort to determine the type and severity of sanctions most effective in discouraging offenders from committing further offences. In a three-year follow-up period, subsequent convictions for drinking and driving, as well as other traffic and criminal offences, were recorded. Using sophisticated statistical techniques, Homel concluded that, in general, there was no relationship between sanctions and recidivism. Neither the type nor the severity of the penalty significantly affected the probability of an offender being convicted again. There was, however, a marked tendency for the most severe sanctions (particularly incarceration to be associated with higher rates of recidivism. One explanation of Homel's finding of no relationship between type of sanction and recidivism is that different penalties were applied indiscriminately. The results of sanctions effective for subgroups of offenders were obscured by the indifferent or adverse effects on the group as a whole.

Throughout his report, Homel (1980, 1981a) makes repeated mention of the differential impact of sanctions according to offender characteristics. For example, moderate, but not severe fines, appeared most effective in discouraging young, low income offenders. Licence disqualification for periods of up to 18 months was optimal for offenders who had no other concurrent traffic offences; two to three years' disqualification worked best for those with a previous conviction for driving while disqualified. Two groups of offenders were identified on the basis of their risk of reconviction. High-risk offenders included young, "criminal" types, older problem drinkers, and those involved in a wide range of criminal or traffic violations of which drinking and driving was but one offence. Good-risk offenders were simply described as persons without other traffic or criminal violations. Further research that specifically examines recidivism in relation to offender characteristics (as

opposed to severity of sanction) would be better able to describe the types of offenders best suited to certain sanctions. In this way, the sentencing process could be tailored to accomplish the goals of retribution and specific deterrence. Similar research efforts in Canada are very much needed.

4.2.3 Incapacitation. The intended function of incapacitation is to prevent offenders from committing a subsequent violation by restricting their ability to do so. Incapacitation comes in several forms for drinking drivers including incarceration, impoundment of the offender's vehicle, and suspension or revocation of driving privileges. Mandatory incarceration is certainly an effective means to incapacitate an offender but is relatively uncommon, particularly for first offenders. Prison has not traditionally been viewed as an appropriate sanction for drinking drivers. In Sweden, offenders with a BAC over 150 mg% must serve a mandatory prison sentence. As mentioned above, the experience has not proven entirely satisfactory and, in order to accommodate the number of offenders and to separate drinking drivers from "real criminals", a special "open" jail system was required. In Canada, a prison term must be served upon conviction of second and subsequent offences. A total of 25 states in the U.S. prescribe "mandatory confinement" for DWI offenders, thirteen of which include first offenders in the law. Jail sentences for drinking drivers have reportedly contributed to overcrowding in institutions and are often a factor in increased requests for jury trials and plea bargains to lesser charges (NHTSA 1983).

Licence suspension and revocation are by far the most popular and widely used methods of incapacitation. In effect, the suspension of driving privileges amounts to only "partial" incapacitation, for there is nothing physically preventing offenders from driving if they choose to do so. Persons with suspended or revoked driving licences, many believe, do take the opportunity to drive while disqualified, despite threats of punishment to deter this behaviour. Impounding the offender's vehicle is seldom done. This, too, does not guarantee the offender will not drive. Such action may also inflict hardship upon others who

have not committed an offence. Moreover, storage of impounded vehicles --perhaps upwards of 100,000 in Canada--would prove expensive and problematic. Both Homel (1980, 1981a) and Hagan (1978) report that in many cases suspensions alone have the desired effect, without additional sanctions of this kind.

There is little information available on the method of incapacitation most effective for which types of offenders. Groups identified as being at high risk of reconviction might be considered for more restrictive measures. Good behaviour bonds coupled with a monetary surety were viewed by Homel (1981a) as a potentially effective means to ensure compliance with licence suspensions for "good risk" offenders. The controversy over the utility of suspended or revoked driving privileges continues. In the absence of specific information on the characteristics of individuals who are most likely to comply with these orders, everyone is treated alike.

4.2.4 Rehabilitation. Rehabilitation refers to any education, information, treatment, or retraining program given to offenders in an attempt to change their attitudes and behaviour with respect to the commission of subsequent violations. Rehabilitation is the ultimate goal of the health-legal approach to dealing with drinking driving offenders. Unfortunately, rehabilitation programs have often been considered a substitute for harsh sentences that might otherwise have been given, thus "weakening" the deterrent effect of criminal law. This prevalent concern misses the obvious: effective programs of rehabilitation can complement punitive measures and can contribute substantially to the overall goal of preventing recidivism.

Numerous rehabilitation techniques have been attempted: education/information seminars (e.g., Stewart and Malfetti 1970); alcoholism treatment (e.g., Seixas and Hopson 1975); and driver improvement (e.g., Kunkel 1983). The types of offenders offered these rehabilitation programs tend to be those deemed in most need of them--multiple offenders and other "deviant" cases. In a recent review of the effectiveness of rehabilitation programs for convicted drinking drivers, Mann et al.

(1983) concluded that, although there are some positive findings, there is considerable room for improvement in programs as well as in evaluation methods employed to determine the efficacy of these efforts.

Yet to be determined is which type of rehabilitation program is most appropriate for which offenders. Clearly, treatment for alcohol abuse is necessary and worthwhile for alcoholic offenders. The assessment and diagnosis of alcoholism or problem drinking are often time consuming, costly, and inexact. Furthermore, there are different "types" or stages of alcohol abuse and numerous approaches to treatment. Determining which treatment is best suited to which types of individuals remains unresolved, even among treatment professionals. Knowing the relevant characteristics of persons most likely to benefit from specific programs would allow more selective referral and reduce costs greatly. Increased knowledge in this area would definitely permit more effective use of limited resources, given current fiscal restraints.

4.3 Summary

Research and other means of advancing knowledge about drinking drivers have received scant attention compared to programs to reduce the frequency of alcohol-impaired driving and related road accidents. The relevance of efforts to provide more in-depth information about offenders--beyond age, sex, and BAC--is often questioned by policymakers, practitioners, and the public. Nonetheless, the relative ineffectiveness of the criminal justice system in dealing with alcohol-impaired driving--a conclusion supported by statistical evidence of the magnitude and persistence of the problem--suggests a strong need to know more about offenders and ways to reduce recidivism. The purpose of improving the very limited knowledge base is to maximize the effectiveness of the criminal justice system, realizing that criminal law, law enforcement, and penalties upon conviction alone cannot produce substantial reductions in the problem.

The traditional emphasis on criminal law and its enforcement as a "solution" to the problem of alcohol-impaired driving greatly influences

current thinking. Citizen activist groups have spearheaded a renewal of the "war against drunk drivers" and have advocated stronger use of the criminal justice system in dealing with the problem. Their calls for harsher penalties for all persons convicted of alcohol-related driving offences do not reflect the great diversity of offenders or the wide range of seriousness of their offences. Experts have criticized this approach, citing evidence of its past ineffectiveness and even its counterproductive effects. The ensuing debate, which continues today, relates to the more general issue of the proper scope of criminal law and its application in this area of concern.

What is needed is a comprehensive reassessment of criminal law in relation to alcohol-related driving offences. There exists a substantial gap between the crime of alcohol-impaired driving as symbolized in the Criminal Code and the actual beliefs, attitudes, and practices of the general public. The obvious reluctance of people to consider alcohol-impaired driving a "criminal behaviour" stems from their own willingness to engage in this behaviour. Moreover, offenders tend to represent a more complete cross-section of the population than people who commit "real" crimes. The apparent discrepancy between present criminal law and widespread acceptance of drinking and driving as socially normative behaviour has strong implications for how to deal with people convicted of alcohol-related driving offences.

Nonetheless, for all practical purposes, the criminal law and the criminal justice system will remain heavily involved in dealing with alcohol-impaired driving and the vast majority of offenders. It is imperative, therefore, that the following issue be carefully studied and, to the extent possible, resolved:

Given the diversity of people who engage in drinking-driving behaviour and the wide range of consequences thereof, how can the criminal law be best employed to deal effectively with alcohol-impaired driving and, by extension, the deaths, injuries, disabilities, and other losses due to alcohol-related road accidents?

This question seems best addressed in light of the purpose and principles of application of criminal law.

- o In order to deal fairly and appropriately with behaviour that causes or threatens serious harm, it is important (1) to distinguish which types of drinking-driving behaviour threaten real harm and (2) to determine how to deal in a fair and reasonable manner with offences that range from minor to very serious.
- o The need for maximizing the deterrent effect of criminal law and sanctions has to take into account the extent to which legal solutions interfere excessively with individual rights and freedoms. Sanctions should relate directly to the gravity of the offence and the responsibility of the offenders.
- o Rehabilitation, in addition to retribution, is an intended function of sentencing. If the cause of a problem is not eliminated, the symptoms may reappear, no matter what the severity of penalty. More attention to rehabilitation, especially for "problem drinkers" and "alcoholics", is warranted in the context of criminal law.

Determining how society can deal most effectively with alcohol-impaired driving as a social problem with legal implications--in accordance with the purpose and principles of criminal law--depends greatly on information about the characteristics of offenders and how these characteristics interact with different sanctions to accomplish the goal of reducing alcohol-related road accidents.

The need to advance knowledge about drinking drivers in general and those convicted of alcohol-related driving offences in specific relates to the traditional aims of sentencing: deterrence, retribution, incapacitation, and rehabilitation.

With respect to the deterrent effect of penalties for alcohol-related driving offences, it seems clear that increasing the severity of sanctions is less effective than increasing the perceived risk of arrest. High-risk subgroups of alcohol-impaired drivers may not be deterred at all, even after one or more convictions. This indicates the need to

know which types of offenders belong to "low-risk" and "high-risk" categories and which penalties and conditions of probation reduce recidivism for different groups of offenders.

Retribution for criminal offences is a cornerstone of the structure of criminal law. The extent of punishment for alcohol-related driving offences and the severity of penalties may not relate simply to the rate of recidivism. Excessively severe or inappropriate sanctions may increase recidivism among some groups of offenders. Beyond "tempering justice mercy", we have to consider the possibility that punishment per se can exacerbate "root causes" of alcohol-impaired driving and increase the likelihood of repeated offences among certain groups of offenders. Investigations into which offenders respond to what degree of severity of punishment is crucial to developing sentencing guidelines.

Incapacitating offenders in order to prevent subsequent offences involves sanctions ranging from imprisonment to court-ordered prohibitions of driving. There is little information on which method of incapacitation is most effective for which types of offenders. For example, the common practice of suspending driving privileges may work well for many offenders, but allow others to operate motor vehicles freely and to commit even more serious alcohol-related driving offences. In the absence of efforts to advance knowledge in this area, the success of methods of incapacitation will remain on a "hit-or-miss" basis.

Rehabilitation--including education, treatment, or retraining programs--addresses "root causes" of alcohol-related driving problems. The appropriateness of different programs offered in lieu of or in addition to punitive sanctions for different groups of offenders remains largely unstudied and therefore not known. Also unknown is which kinds of treatment programs for persons who consume alcohol frequently in large volumes are effective for whom. Our present knowledge base cannot provide the guidelines necessary for informed sentencing decisions. Given the scarcity of treatment facilities, the need for selective referrals, based on characteristics of offenders, is acute.

The term research has negative connotations for many concerned with drinking-driving problems. Some even consider a call for more research to advance knowledge about the problem another way of "doing nothing". These and similar attitudes and beliefs about research impede progress in maximizing the effectiveness of criminal law and the criminal justice system in dealing with persons convicted of alcohol-related driving offences. The principle that understanding a problem and its underlying issues leads to more effective control measures, while accepted by policymakers, practitioners, and the public in the practice of Medicine, has yet to be accepted in the application of criminal law to drinking-driving problems. The need for better information is as obvious as it is critical. Only the acceptance of this need by those concerned and involved with the problem of alcohol and road accidents seems in doubt. Beyond acknowledgement of the need for knowledge relevant to operational programs, we still await a genuine commitment to obtain that information.

5.0 SENTENCING OPTIONS: THE PRESENT STATE OF KNOWLEDGE AND IMPLICATIONS FOR FUTURE ACTION

This section addresses two basic questions that relate to characteristics of drinking drivers.

1. Does the present state of knowledge support the effective use of sentencing options for people convicted of alcohol-related driving offences?
2. Given the priority of action programs (also termed "countermeasures"), how can we obtain needed information in the process of doing something about alcohol-impaired driving?

Throughout this report we have referred to the present state of knowledge as limited, inadequate, and fragmented. Having already answered the first question above, we briefly summarize our assessment of available information on groups of drinking drivers in Section 5.1. Section 5.2 outlines a strategic approach to advancing knowledge and provides an example of a programmatic initiative.

5.1 The State of Knowledge with Reference to Sentencing Options

As we noted at the start of this report, we have not dealt specifically with sentencing options for persons convicted of alcohol-impaired driving. That is, we have not reviewed the many possible options--e.g., treatment of alcoholism or problem drinking, community service orders, court-ordered prohibition of driving, educational courses, etc.--and their use or availability throughout Canada. Nor have we examined the effectiveness of different programs as reported in the literature or by agencies responsible for their delivery. A careful study of the theory and practice of sentencing options as well as current capabilities to use them in Canada would complement the present effort and provide a useful state-of-the-art report for all concerned.

Our review focused instead on the characteristics and attributes of different groups of drinking drivers. In this way, the compilation of information could serve the various purposes of policy planning and program development. We did consider however, the use of that

information for sentencing options. In that context, we discuss the adequacy of present knowledge in that context below.

The information presented in Section 3.0 of this report indicates that we know a good deal about the characteristics of drinking drivers, at least those that have been identified as such. Studies have traditionally separated groups of drinking drivers according to the consequences of their behaviour--involved in an accident, apprehended by police, or no adverse consequences. Certain groups are more accessible for study than others; therefore, comparisons among groups are restricted to variables that comprise the smallest common denominator--most often, age, sex, and BAC. As basic descriptive data, this information has general value in comparing the different populations and in monitoring the problem over time. There remains a tremendous amount of potentially useful information about offenders that investigations to date have only touched upon. Moreover, the present state of knowledge is based almost exclusively on static, cross-sectional representations of those who come to our attention as "drinking drivers". This approach to generating information cannot define or describe the dynamic nature of drinking-driving behaviour--how individuals move from one risk state to another; how they manage (often repeatedly) to avoid detection or other incident; and who becomes involved how (and how often) in alcohol-related crashes. In-depth, longitudinal, prospective studies are necessary to advance the state of knowledge.

Of the different groups of drinking drivers, the criminal justice system has direct contact with those that come into conflict with the law as the result of their behaviour--persons arrested and convicted for alcohol-impaired driving offences. This is also the group that has been most thoroughly studied. Appendix B of this report summarizes what is presently known about the characteristics of this subset of drinking drivers. This type of information, though certainly not comprehensive, provides general answers to the question: "Who is the arrested/convicted drinking driver?" Knowledge of the prominent characteristics of this entire group is of value to lawyers, judges, and police officers in that it enables them to be better prepared for the type of person

with whom they will come into contact in this area. It also allows one to make an educated guess, based on common sense, as to the range of programs necessary to deal with these offenders. Therefore, information on this group of drinking drivers can be very useful and relevant to the criminal justice system.

But we might now ask: "How adequate is descriptive information on groups of offenders for sentencing the individual?" The present state of knowledge has identified prominent characteristics of groups of drinking drivers; it does little to inform us about which type of sanction or program is best suited to which type of individual. Given the great diversity of the characteristics of people who drink and drive, it can be safely assumed that no one program or sentencing alternative will benefit all offenders. Clearly, a wide range of sanctions has application in this area. Nevertheless, despite the wealth of information collected to this point, we still find ourselves at a great disadvantage because we do not know a priori the characteristics of people who would "benefit from" each available alternative. In fact, even with more in-depth knowledge about different subgroups of convicted impaired drivers, we still would find it very difficult to state the likelihood of possible outcomes (e.g., reduced recidivist rates). In the absence of adequate evaluations of existing programs--studies that indicate who benefited, who did not, and why--we lack any empirical basis for both assigning offenders to programs and selecting sentencing alternatives for development.

If the foregoing is a fair representation of the state of the art, then we can understand why many past efforts to provide alternatives in lieu of (or in addition to) fines, licence suspensions, and even jail have received poor evaluation reports. For example, an educational course may reach only a minority of those referred to it by judges who have no formal, objective criteria for such referrals. The beneficial effects of the course experience for the few will be lost in analyses based primarily on zero-sum evaluations (those that indicate success or failure in black and white terms). These do not provide detailed information on how the program was conducted (process evaluation), for

whom, and why the results of the program were what they were. Evaluations that allow refinement in programmatic objectives, programmatic design, client selection, and client treatment, would not encourage "throwing the baby out with the bath water" nor a frustrated, vengeful return to traditional sanctions like stiff fines and lengthy jail terms. Rather, a process that increases knowledge, develops and refines programs, and monitors their conduct as well as their outcome appears required for progress. This process, described in the following sections, could, and should, be implemented to support the development of new sentencing alternatives as well as to refine existing ones.

5.2 Implications for Future Action

Having examined the existing state of knowledge under the present system of dealing with drinking drivers, there are essentially two directions along which future action can proceed:

1. Maintain the status quo--do little or nothing--and expect little, if any, improvement in the effectiveness of using the criminal law and the criminal justice system in dealing with drinking-driving problems.
2. Initiate a strong program of research and development aimed at increasing knowledge useful in developing innovative approaches to sentencing and in rationalizing the use and application of sentencing options.

We believe that a substantial reduction in the magnitude of the alcohol-crash problem can only be effected through a major, coordinated, long-term effort. This type of approach includes traditional approaches to the problem--legal, health, educational, etc.--and also includes other, innovative approaches. It is likely that no single "best" strategy based on specific countermeasures exists. Rather, an approach combining all others, unified by a strategic plan, best satisfies the needs identified in this area of public health and safety. Of primary importance, then, is a detailed, implementable strategic plan similar to that proposed by Donelson (1982, 1983). The sections that follow outline such a plan.

5.2.1 A model for future action. The strategic plan can be outlined in terms of three integral components: action, evaluation, and research. This model is illustrated in Figure 8. These components should not be considered as separate activities within a common, conceptual framework. Rather, the components represent a distinct and inter-related functions of an integrated and coordinated societal response.

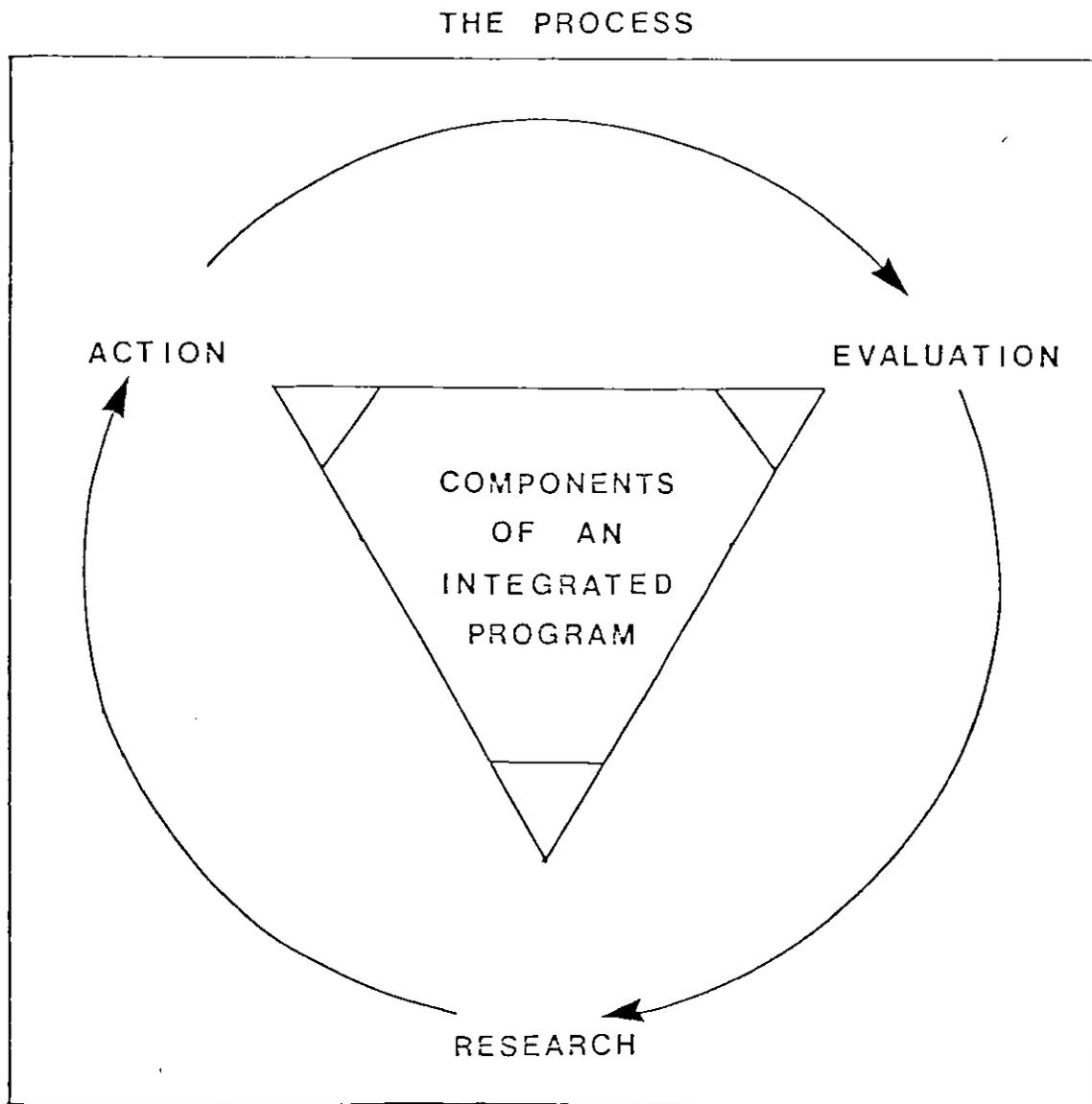
The emphasis on integration and coordination reflects concern about the effectiveness of past efforts to deal with the problem. Countermeasure programs in this plan comprise the activity associated with the action component. Their past isolation from the functions and roles of research and evaluation have lessened their potential impact, which has certainly been less than that desired and expected. The strategic plan outlined in this section acknowledges explicitly the essential roles of research and evaluation.

The relevance of research activity and the value of evaluation activity can be greatly enhanced by functional integration with countermeasure programs. Coordination of action, evaluation, and research activities becomes a critical prerequisite to successful application of the model.

The first component of the strategic plan is action. Citizens concerned about human and other losses due to alcohol-related traffic crashes demand that something be done now. Others argue that it would be unwise to introduce countermeasures in the absence of knowledge demonstrating the effectiveness of such programs. The strategic approach suggests that sufficient information exists to launch a wide variety of specific programs that offer practical and promising responses to the alcohol-crash problem. This approach recognizes the fact that no single solution is likely to work for everyone. Numerous plans of action must be undertaken that encompass a wide range of offenders. Insofar as possible, some programs will be specifically geared to certain types of offenders. Each will require a strong research and evaluation component in order to refine existing programs to improve their effectiveness in the process of continued action.

FIGURE 8

A PROGRAMS MODEL INTEGRATING ACTION, EVALUATION, AND RESEARCH FUNCTIONS



As the second component of the overall strategy, evaluation serves as a dynamic link between action and research. Evaluation is intended to measure and report the effects of action programs in order to provide input to researchers and feedback to program managers.

As discussed by Warren and Donelson (1982) and Donelson (1984), evaluation as an activity can become a diversive issue in this field and, in practice, is often counterproductive. This need not arise, given the conceptual framework underpinning the strategic approach under discussion. Of all lessons from the past, those related to evaluation seem most thoroughly learned and least applied. Of the many options for the future, those involving evaluation seem most attractive. In fact, the function and role of evaluation represents a vital--and often missing--link between research and action components.

The issues surrounding evaluation and past experience with evaluations of drinking-driving programs have been discussed elsewhere (Jones and Joscelyn 1979a; Warren and Donelson 1982; Donelson 1984). To resolve key issues related to evaluation, and to avoid rejection of this critical component by decision-makers, researchers, or program managers, we have to accept that evaluation as a component either of an integrated program or of a strategic plan belongs neither to the research community nor to the programs community.

In other words, we must broaden the concept of evaluation beyond "evaluation as program component" and "evaluation as research activity". In fact, we have to broaden our concepts of research and countermeasures (or, better, action) as well. The broader concept of evaluation, research, and action would treat each as functions, not activities. An analogy might serve to elucidate this point. The heart's function in the body is to circulate the blood; its activity is regular, coordinated muscular contraction. Briefly, then, the function of evaluation is to generate information about the implementation of action programs and about their effects and their effectiveness in achieving explicit goals and objectives (Donelson 1984).

In addition, evaluation as a functional component of an integrated program or a comprehensive strategic approach also serves:

- o to measure the broader impact of action programs on the community;
- o to determine whether allocated resources were adequate to accomplish stated goals; and
- o to determine the duration of programmatic effects, both positive and negative.

The results of evaluation activities must be used if the potential value of evaluation is to be realized.

As a functional component of efforts to reduce alcohol-crash losses, evaluation supports the refinement of existing programs and initiatives; the development of innovative programs; and the generation of new information to advance the state of present knowledge.

The third component of this strategic approach is research. Significant gaps exist in basic information about drinking-driving behaviour. Lack of knowledge hinders the development of more effective approaches to the problem. Sustained, meaningful, and effective programs are not possible in the absence of adequate knowledge about the dimensions and dynamics of the problem, particularly socio-behavioural aspects. New initiatives must flow from a broad, solid program of research.

The activities associated with the research component include:

- o gathering data to further define and monitor the problem;
- o compilation, analysis, and interpretation of the results of evaluation studies in terms of current theory and in light of present knowledge and understanding;
- o studies to identify, develop, and, in cooperation with program managers, pilot-test new program initiatives.

The results of research efforts support activities associated with the action component, providing knowledge and ideas concerning how existing programs can be expanded, or modified, or even redirected to make them more efficient and effective.

We cannot overemphasize that research, action, and evaluation represent three distinct yet integral functions in the overall effort to reduce alcohol-crash losses. Each functional component relates to the other two in a complementary fashion, as shown in Figure 8. In fact, functioning together, these components represent a continuous, interactive process at the level of programs. This conceptual framework also offers a way of thinking about research, action, and evaluation that allows agencies and individuals to rise above "territorial imperatives", "turf building", and other counterproductive activities engaged in by many in this field.

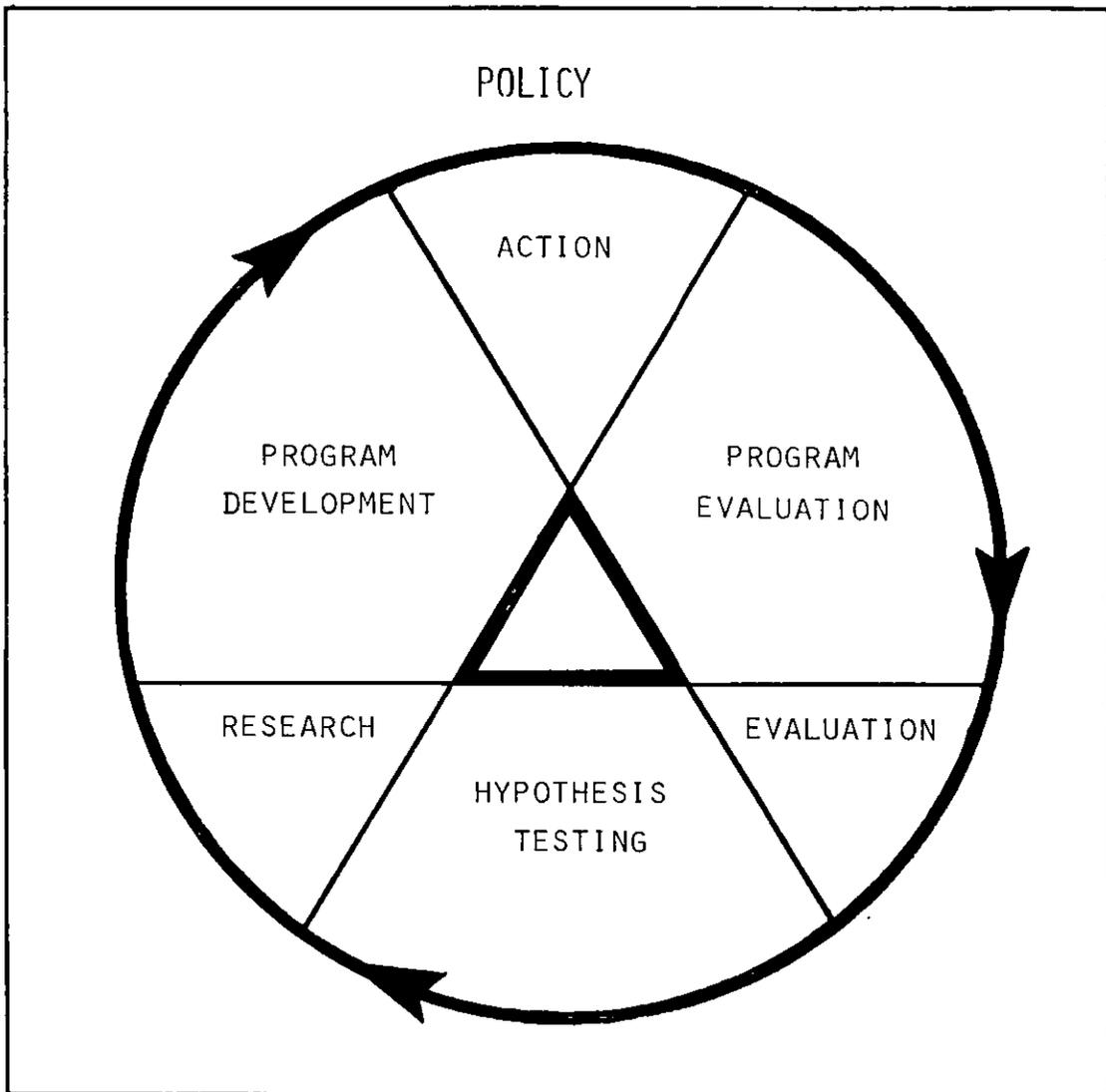
Figure 9 elaborates the model and further defines the relationships between the three components. It also adds a fourth, critical element: policy. In the absence of an explicit policy that establishes and maintains the iterative process illustrated in Figure 8, it is highly unlikely an integrated program with functional components--action, evaluation, and research--will operate in the real world. Moreover, without such a policy, the activities associated with program evaluation, hypothesis testing, and program development will continue as they have to date: fragmented, uncoordinated, and, too often, counterproductive. The result will be that the effort as a whole will produce results far less, and far less cost-effectively, than the sum of its parts would promise.

The principle of evaluation as function, not activity, represents the missing link that should dissolve any existing barriers between policy-makers, program managers, and researchers--if the three-component integrated programs are designed in accordance with that policy.

In summary, a long-range, carefully designed strategy, coupled with a sincere, long-term commitment offers considerable promise in producing

FIGURE 9

MODEL OF THE STRATEGIC PLAN



substantial reductions in the alcohol-crash problem in the future. Past efforts have been less than successful and less than completely adequate. New initiatives that lead to new, potentially effective programs are urgently required. These programs must be tested and rigorously evaluated. Programs demonstrated to be effective can be considered for widespread implementation. Research and evaluation will help refine these programs to make them more efficient and effective. In this integrated and interactive manner, meaningful reductions in the alcohol-crash problem can be realized.

The following section indicates how this strategic plan might be applied to rationalizing the use of sentencing options and maximizing their effectiveness.

5.2.2 A programmatic initiative. Acknowledging that the alcohol-crash problem persists at intolerable levels and that the present system of handling drinking drivers has proven less than adequate, we outline a prospective, proactive approach for implementing new initiatives in dealing with offenders when they enter the legal system. This approach relies on the components of the comprehensive, coordinated strategy represented in Figure 9 and discussed above in detail.

Unlike the existing system in which all offenders are treated in a similar fashion (Figure 10), the proposed approach recognizes explicitly that not all offenders are alike and are likely to respond in different ways to a variety of sanctions. The Alcohol Safety Action Project (ASAP) in the United States (e.g., NHTSA 1980) utilized the model illustrated in Figure 11. This schema classified offenders into three groups according to the severity of their involvement with alcohol: alcoholics, problem drinkers, and social drinkers. This approach, albeit somewhat simplistic, represents a vast improvement over that traditionally employed. The approach proposed in this section includes many of the action components illustrated in Figure 11 but, most importantly, integrates evaluation and research components into a comprehensive, coordinated strategy that is intended to refine and develop the system into a very effective and efficient means to deal with the drinking-driving offender.

FIGURE 10

**THE PRESENT SYSTEM
HANDLES ALL
DRINKING DRIVERS
THE SAME WAY**

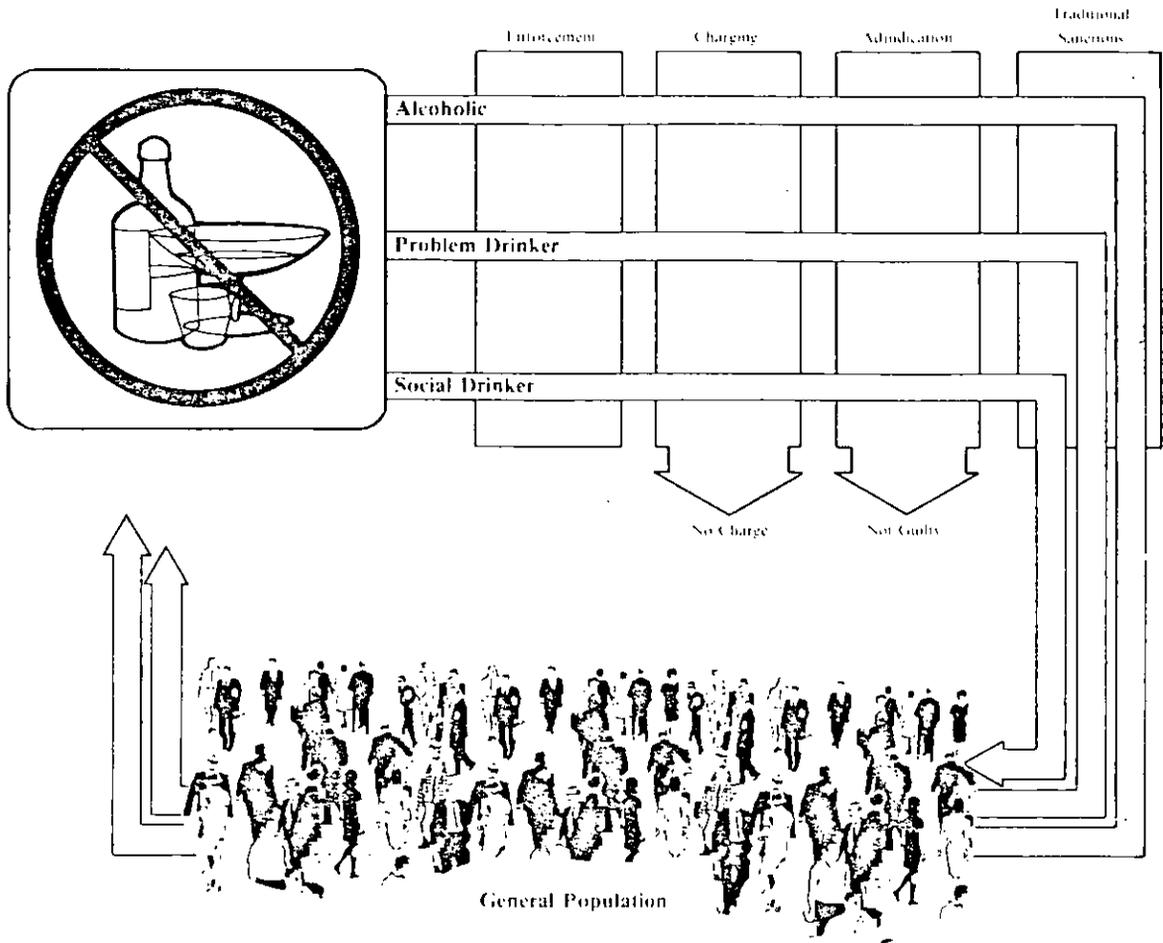
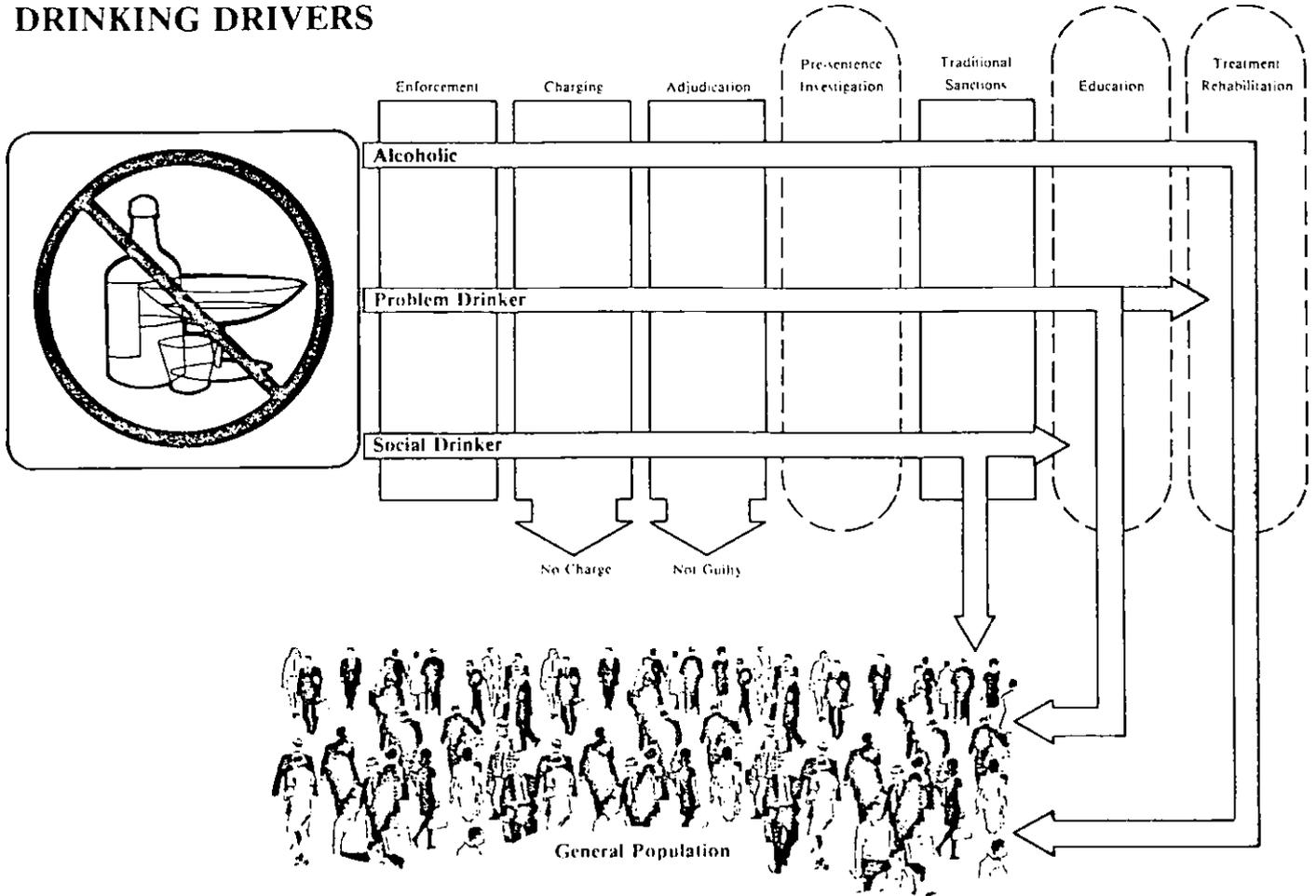
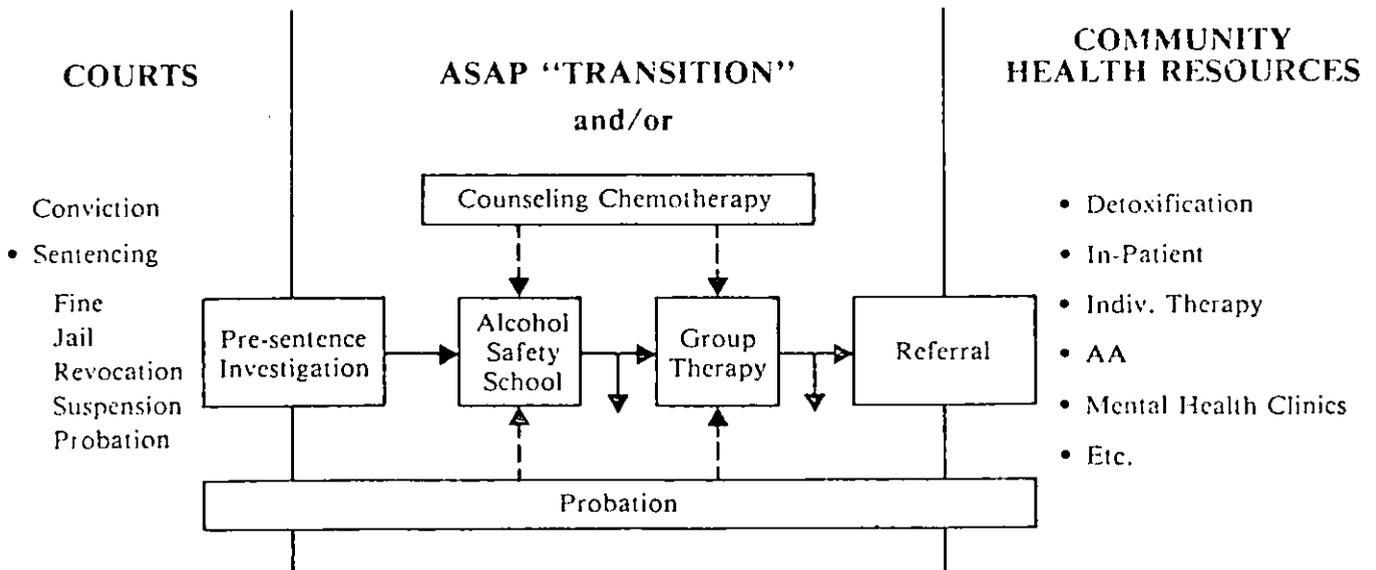


FIGURE 11

**THE PROPOSED SYSTEM
DISTINGUISHES
BETWEEN DIFFERENT
KINDS OF
DRINKING DRIVERS**



**THE ASAP CONCEPT OF A
SCREENING, DIAGNOSIS,
AND REFERRAL SYSTEM**



The first component of this programmatic initiative is action. This might require the implementation of a series of pilot and/or demonstration projects in selected communities. New programs and sentencing alternatives could be introduced for application to different types of offenders. Another possibility is to identify jurisdictions actively using one or more sentencing options and to investigate their operation. At present, society relies almost exclusively on judicial discretion to determine appropriate sanctions for an individual offender. Given that drinking-driving cases are usually dealt with in under ten minutes by the courts (NHTSA 1983), it is unclear how accurately and with what consistency judges make their assessments of offenders. One of the key aspects of the proposed system is a procedure to screen offenders in a consistent, standardized, and objective manner prior to either court appearance or sentencing. This pre-trial investigation need not take in excess of 30 minutes in most cases. This screening or assessment procedure is not intended to replace or interfere with judicial discretion but rather to supplement the process with objective information about the offender that might not otherwise have come to the court's attention. The pre-trial or pre-sentence investigation would provide the court with the type of information necessary to determine which combination of sanctions would be most appropriate to meet the objectives of the criminal justice system as well as the needs of the offender. Beyond its use in sentencing per se, the information obtained would be invaluable for evaluation purposes.

New sentencing alternatives could also be introduced to assist the legal system in accomplishing its intended objectives. Traditional sanctions such as fines and incarceration have been effective only in so far as they serve the retribution function of the law. Retribution, though, can sometimes conflict and interfere with the other intended goals of sentencing--deterrence, incapacitation, and rehabilitation. This need not be the case. By utilizing traditional sanctions in combination with new alternatives, the goals of criminal law could be better realized.

Rehabilitation is often cited as a necessary, but often neglected, aspect of law-based measures dealing with drinking drivers. Treatment

is not viewed as punishment and therefore does not serve the retribution function of sanctions. It is, however, possible to achieve both goals at the same time with an approach described by Siegal (1982a,b) known as the Weekend Intervention Program (WIP). After serving one of three days' mandatory jail term, offenders are directed by the court to attend a mandatory two-day assessment. The weekend program consists of an intensive evaluation of the psycho-social functioning of clients, education, and group therapy sessions to explore the extent of alcohol involvement in clients' day to day lives. The program has three major goals: diagnosis/assessment of the individual, preparing the client (i.e., increasing motivation) for further treatment, and referral to the appropriate resource. Preliminary findings from an evaluation reveal a positive influence of this program, particularly when recidivist offenders are involved. The program is supported entirely by fees paid by the offenders, currently \$175. Hence, the WIP serves the retribution function by incarcerating offenders for one day, after which they are confined for a two-day period, and requiring them to pay for the service. WIP also realizes the rehabilitative function of sentencing in the process.

Other alternatives might also be considered for different types of offenders. Community service orders have been cited by NHTSA (1983) as serving the functions of retribution, incapacitation, and rehabilitation. Drinking drivers are considered good candidates for community service as over 90% of offenders fulfill their obligations (NHTSA 1983). Probation and good behaviour bonds when combined with a monetary surety were suggested by Homel (1981a) as having potential benefits for offenders who were without prior driving or criminal record. Educational programs have some popular support but they vary considerably in their content and effectiveness. Educational courses are often used exclusively and perhaps inappropriately for recidivists. Programs could be refined and expanded to include a wider variety of offenders and should be targeted to those most likely to benefit from education. Driver retraining courses (e.g., Kunkel 1983) could be developed and implemented for persons who show a record of persistent driving-related offences. The goal of these programs is to change driver behaviour in a

positive direction in order to reduce the likelihood of future accident involvement.

The comprehensive strategic approach integrates an evaluation component into the model in order to monitor the actual impact of the action programs. Evaluation is intended to determine the extent to which the programs are achieving their stated goals and to provide feedback to further refine and improve existing programs. Therefore, evaluation must not only provide follow-up data on recidivism rates ("prove it" or outcome evaluation) but offer insight into the conduct of a program as well ("improve it", or process evaluation). A system of following convicted offenders over a period of 3 to 5 years would be put in place in order to provide data for the evaluation of various action programs. Information on offender characteristics; the circumstances of arrest, including blood alcohol concentration data; and the type and severity of sanctions would provide measures used to predict recidivism. Programs shown to have high recidivism rates could be redesigned or discontinued; successful ones could be improved to make them function more efficiently and effectively. Offenders who display certain characteristics and are shown not to respond well to one program could be assigned to a more appropriate program.

Evaluation, although most closely affiliated with the action component, provides direct input to the research component as well. In this strategy, research has several objectives:

- o develop instruments, procedures, and training methods for pre-sentence investigations;
- o gather data on the rates of arrest, conviction, and accidents to further define and monitor the problem;
- o compile results of evaluation studies for use by other agencies considering the use of sentencing options;
- o test hypotheses derived from evaluation studies that might lead to new programs or to the development of a sounder, theoretical basis for sentencing offenders;

- o determine the characteristics of offenders best suited for sentencing alternatives to assist judges in making sentencing decisions;
- o determine the effective components of action programs so that programs can be revised and new one implemented.

Research serves to fill information gaps in the system and tests new ideas that might improve the effectiveness of the model in reducing the drinking-driving problem.

Each component of the strategic approach is an integral, albeit distinct, part of the model. They must be implemented together and integrated to provide meaningful solutions to the problem. The strategic plan is a dynamic, iterative process that constantly changes to meet the demands imposed upon it. As knowledge advances, new or improved programs can be implemented. These are evaluated and their progress monitored. Ultimately, this leads to changes and revisions. We must know how and why a program achieved what it did (or did not) in order that we might better understand the direction to be taken to improve our efforts. The strategic approach presented above offers such an alternative, one that we believe will effect meaningful reductions in the drinking-driver problem.

5.3 Summary

Present knowledge of the characteristics and attributes of drinking drivers seems extensive, given the number of available reports and the wealth of statistics. Close scrutiny reveals little depth of information. Few investigations have examined the relationship between the characteristics of offenders and the different types of sanctions or sentencing options. On the one hand, we know that persons convicted of alcohol-related driving offences represent a broad cross-section of society. We can infer with some certainty that subgroups of offenders will respond differently to various programs. On the other hand, we simply lack hard data on which types of offender will benefit most from which type and severity of sanction.

Several studies reported in the literature indicate that information useful in deciding among sentencing options can be obtained. Data on the Canadian experience, however, have yet to be gathered--or, if collected, they have not been reported. Comprehensive information on all groups of drinking drivers has great value for the numerous and diverse efforts to reduce alcohol-impaired driving and its consequences. If the criminal law and the criminal justice system are to play a more effective role in preventing alcohol-related road accidents, then knowledge in three specific areas must be advanced.

- o the characteristics and social circumstances of persons convicted of alcohol-related driving offences across the range of seriousness;
- o the appropriateness of various sanctions for different subgroups of offenders; and
- o the type of programs most effective in reducing recidivism for identified subgroups of offenders.

The fragmented, uncoordinated approach to obtaining relevant data has failed to provide a sound base of knowledge for effective use of sentencing options. Concerted efforts to generate needed information should now have high priority if reducing recidivism among offenders remains a major aim of policy, plans, and programs. In the absence of systematic, focused research, accomplishing this aim seems more wishful thinking than clear intention.

Realistically, few if any experts in the field expect substantial funding for "research projects", especially for relatively large-scale, prospective surveys of persons convicted of alcohol-related driving offences. The current emphasis is on action programs, with research to understand the problem having very low priority. The perceived dichotomy between "doing something about the problem" and "studying the problem" is unfortunate, however inevitable. Nonetheless, we have to confront an obvious, if difficult, choice:

1. Maintain the status quo--do little or nothing--and expect little or no advance in knowledge and little, if any, improvement in the effectiveness of using

the criminal law and the criminal justice system in dealing with drinking-driving problems.

2. Initiate a strong program of research and development aimed at increasing knowledge useful in developing innovative approaches to sentencing and in rationalizing the use and application of sentencing options.

This assessment may appear overly blunt and overstated. The long history of societal efforts to deal with alcohol-impaired driving, however, solidly supports the conclusion. Experts, achieving a rare consensus, have acknowledged the need for a major, coordinated, long-term effort, unified by a detailed, implementable strategic plan. The strategy would combine and integrate three critical components or functions: action, evaluation, and research. To develop and implement such a strategy and to ensure its viability over time, an explicit policy must be established and a sincere commitment to its elaboration must be made.

A simple model was presented to define the structure and process of the recommended strategic approach. In this model, action, evaluation, and research become integral, functional components, each playing a critical role at the level of specific programs and at the level of broader based, more comprehensive responses. Activities associated with each component and with pairs of components, when coordinated, comprise the iterative cycle of programmatic initiatives (action); assessment of design, conduct, and impact of programs (evaluation); and data generation and information processing (research). The essential feature of this model is the opportunity to advance knowledge about a specific problem or to resolve issues in the process of taking action to reduce the problem itself.

This model has great value in the area of sentencing options for persons convicted of alcohol-impaired driving and related offences. An outline of a programmatic initiative described how the model could be applied to make the most effective use of sentencing options. Knowledge important to refining programs and to developing innovative sentencing options would increase over time, thus supporting the overall effort to reduce recidivism.

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CHARACTERISTICS OF DRINKING DRIVERS

APPENDICES

APPENDIX A

Characteristics of Drivers on the Road:
Roadside Surveys of Alcohol Use
by Drivers

A.1 Introduction

The main purpose of conducting surveys of drivers at roadside is to obtain objective information on the extent of alcohol use by drivers on the road. The drivers surveyed in this fashion are considered representative of drinking drivers who are "at risk" but are neither involved in an accident nor apprehended by the police. Hence, such studies provide an indication of the magnitude of drinking-driver population as well as basic demographic information on the individuals who belong to this population.

This Appendix summarizes information collected during the 1974 Canadian Roadside Survey (Smith and Wolynetz 1975; Schliewen 1979). This was a national survey considered representative of the Canadian population of nighttime, weekend drivers. References are made to other studies for purposes of comparison.

A.2 Methodological Consideration

Roadside surveys are generally conducted during the few hours surrounding midnight on weekends, for it is at these times that alcohol use is most common among drivers. The sites selected for sampling must include both rural and urban areas and ensure a sufficient traffic flow to ensure adequate sampling. The types of vehicles stopped include automobiles, light trucks, vans, and motorcycles.

Multi-stage random sampling procedures are employed to obtain a large sample representative of drivers of privately owned vehicles on the road at the times of the survey. Roadside surveys do not address issues

concerning drivers' use of alcohol during weekdays or daylight hours nor are they usually concerned with drivers of commercial vehicles or areas of low traffic volume.

The refusal of drivers to participate in these studies is a persistent problem that has plagued roadside surveys. Evidence indicates that individuals who refuse to provide a breath sample at roadside are more likely to have been drinking. This results in conservative estimates of alcohol use by drivers. The rate of refusal varies from 3-18% of all drivers stopped (SWOV 1977). In the 1974 Canadian Roadside survey, 6.9% of drivers stopped refused to provide a breath sample.

A.3 Alcohol Use by Drivers

The distribution of BACs of drivers from the 1974 Canadian roadside survey is illustrated in Figure A.1¹. The majority of drivers surveyed at roadside had not been drinking. This is not to say that drinking drivers were rare, for it is apparent in Figure A.1 that driving after drinking is a rather common behaviour among weekend nighttime drivers. Approximately 6% of drivers were found to have BACs in excess of the legal limit and 5% were between 50 and 80 mg%.

Table A.1 presents the percentage of drivers in three BAC groups for four different roadside surveys. The different regions produced surprisingly similar results in terms of the percentage of drivers found to have been drinking at each level. The magnitude of this situation does not differ by region, nor has it changed appreciably between 1974 and 1981.

Respondents in the 1974 National Roadside survey were also questioned about the average number of drinks they usually consumed on a drinking occasion. Over 80% of drivers reported drinking an average of 5 drinks or less per occasion. In general, higher BACs were associated with

¹ Note: Figure A.1 uses recorded values of BAC as opposed to the usual convention of grouping all cases with BACs less than 15 mg% as zero.

Figure A.1 1974 Roadside Survey:
BAC Distribution of Drivers

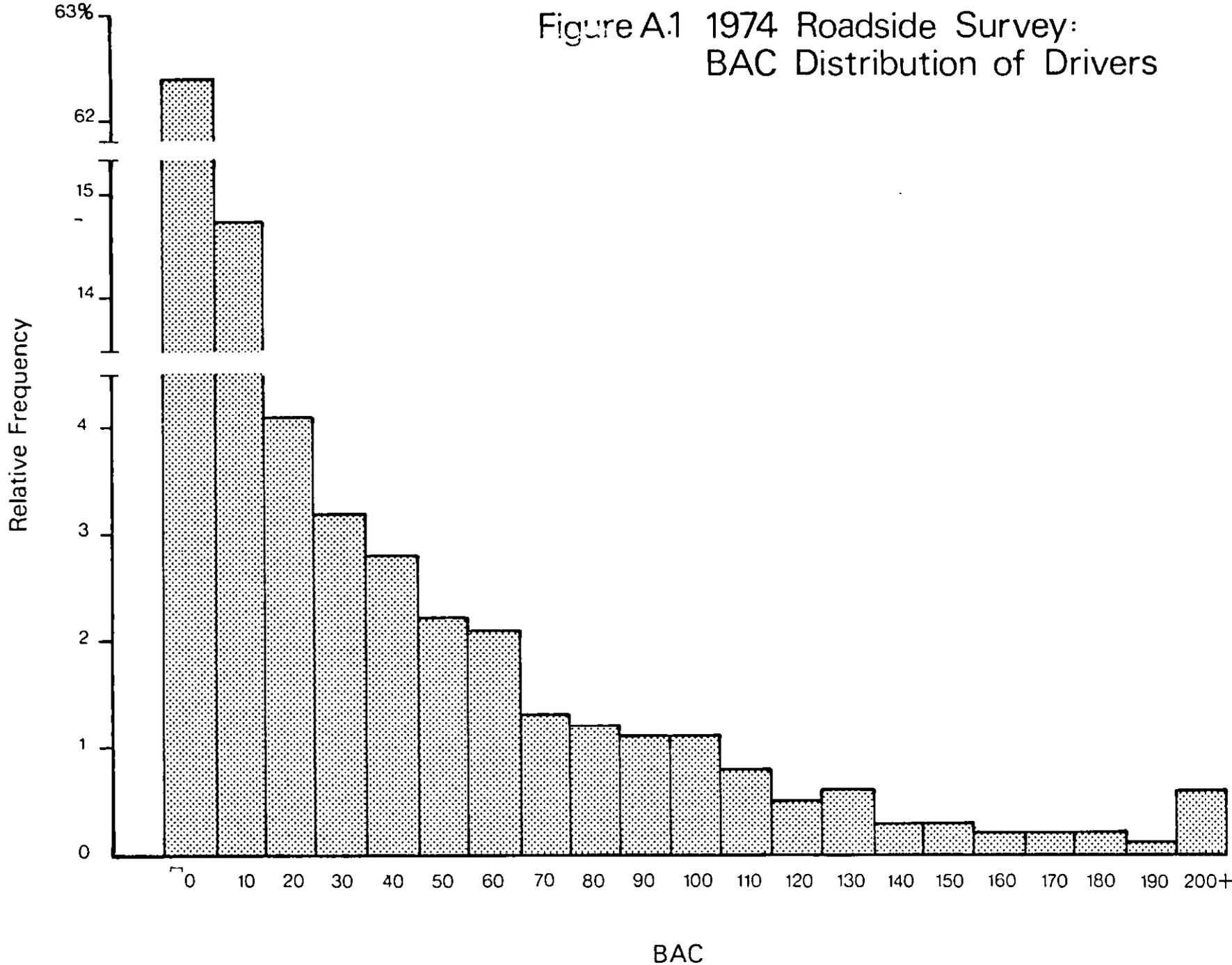


Table A.1

<u>Study</u>	<u>Blood Alcohol Concentration (mg%)</u>		
	<u>0-50</u>	<u>51-80</u>	<u>over 80</u>
1974 Canadian	88.3%	5.4	6.2
1979 Ontario	86.8%	6.6	6.6
1981 B.C.	88.1%	5.9	6.1
1974 Vermont (Damkot 1980)	86.3%	6.8	6.9

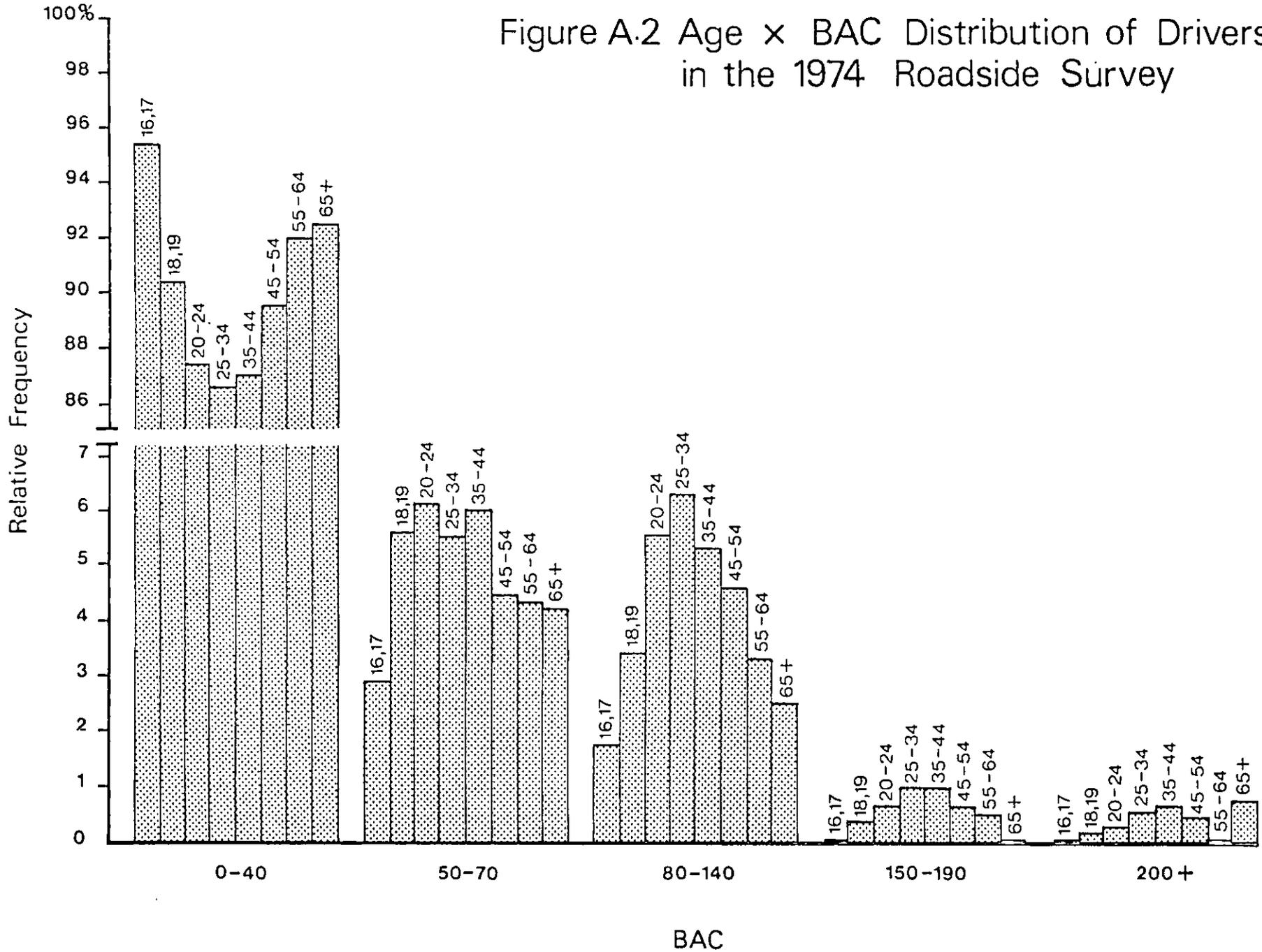
higher reported consumption. Of drivers with a positive BAC, 72% reported an average consumption of 5 drinks or less per occasion. Approximately 60% of those with an illegal BAC at the time of the survey reported consuming an average of 5 drinks or less. In spite of the limitations of self-reported drinking data and the arbitrary cutoff of 5 drinks per occasion, it would appear that the majority of drinking drivers in this sample would not be classified as "heavy" or "excessive" drinkers.

A.4 Basic Demographic Characteristics

A.4.1 Age and sex. The distribution of age among participants in the 1974 Canadian Roadside Survey was presented in Figure 4 in Section 3.1 of this report. This figure clearly demonstrates that drivers between the ages 20-34 comprise the majority of individuals on the road during survey hours. The youngest drivers (aged 16-17) and the oldest group of drivers (aged 55 and over) were least represented among survey participants.

The distribution of BAC among age groups in the 1974 Roadside Survey is illustrated in Figure A.2. Drivers aged 20 to 44 years had the greatest representation among those found to have a BAC in excess of 80 mg%. Young drivers (aged 16-19) and the oldest group of drivers (aged 55 and over) were most likely to be driving while sober or at very low BACs.

Figure A.2 Age x BAC Distribution of Drivers
in the 1974 Roadside Survey



Extremely small proportions of these age groups were found to have BACs in excess of 80 mg% (1.8% and 3.3% respectively). Similar findings are reported in studies conducted in Vermont (Damkot 1980) and Australia (Duncan 1976).

Males comprise the greatest proportion of drivers who were legally impaired. However, it is of interest to note that the representation of females among drivers and among drinking drivers has been increasing in the past decade. In 1974, females comprised 15% of all drivers surveyed, 2.4% of whom were legally impaired. In 1979 (Ontario), female drivers represented 21% of survey participants and 2.4% had BACs over 80 mg%. In 1981 (British Columbia), 26% were females and 3.5% were impaired. Therefore, although impaired driving remains largely the province of males, the ever-increasing presence of females in this population is a situation that requires more detailed evaluation and monitoring.

A.4.2 Occupation and education. The 1974 Roadside survey revealed that the majority of drivers were employed in some capacity. Less than 4% were unemployed and 9.5% were classified as students. Retired and "housewife" categories accounted for less than 5% of the survey sample. Although there was a slight tendency for more unemployed drivers to have been drinking, the differences are not sufficiently large to warrant any definitive statement concerning occupational or educational differences.

Duncan (1976) reports that "tradesman" and "manual worker" categories accounted for the largest proportion of Australian drivers with BACs in excess of 80 mg%. Those in professional occupations were least likely to have high BACs while driving.

Over 80% of respondents in the 1974 Canadian survey had at least some high school education; 22% had attended university. There did not appear to be any trend relating BAC to level of education.

A.4.3 Marital Status. Before making comparisons among marital status groups, it is important to note that almost 95% of the participants in the 1974 Canadian Roadside Survey reported their marital status to be either married or single. Therefore, divorced, separated and widowed individuals comprise a relatively small proportion of the total sample. Figure A.3 presents the distribution of BAC by marital status. Divorced and separated individuals tend to have a slightly higher representation among drivers who had been drinking and among those found to be legally impaired. On this basis, one might speculate that the stressful circumstances associated with separation and divorce might be a high-risk situation that increases in some way the likelihood of engaging in drinking and driving behaviour.

A.5 Driving Variables

Beyond the characteristics of drinking drivers per se, we would also like to know where to find them. Moreover, we want to know where they come from and where they are headed. As shown in Figure A.4, the distributions of BAC among drivers surveyed in metropolitan, urban, and rural areas differ little from each other.

As of late, greater interest has been focused upon the BAC distribution of drivers according to the place of trip origin. Figure A.5 presents this distribution for respondents in the 1974 roadside survey. It is not unexpected that individuals leaving bars and restaurants have the greatest proportion of positive BACs (57% and 33% respectively). A "friend's home" ranks third among the places of origin of trips involving a drinking driver.

Duncan (1976) examined the "purpose of the journey" by BAC for Australian drivers. This analysis revealed that although drivers on "social" trips comprised a large proportion of those with BACs over 80 mg%, it was drivers returning from work that were most prominent at high BACs. Because the specific place or origin was not presented, it is difficult to compare this data directly with the Canadian study.

Figure A.3 1974 Roadside Survey:
BAC by Marital Status

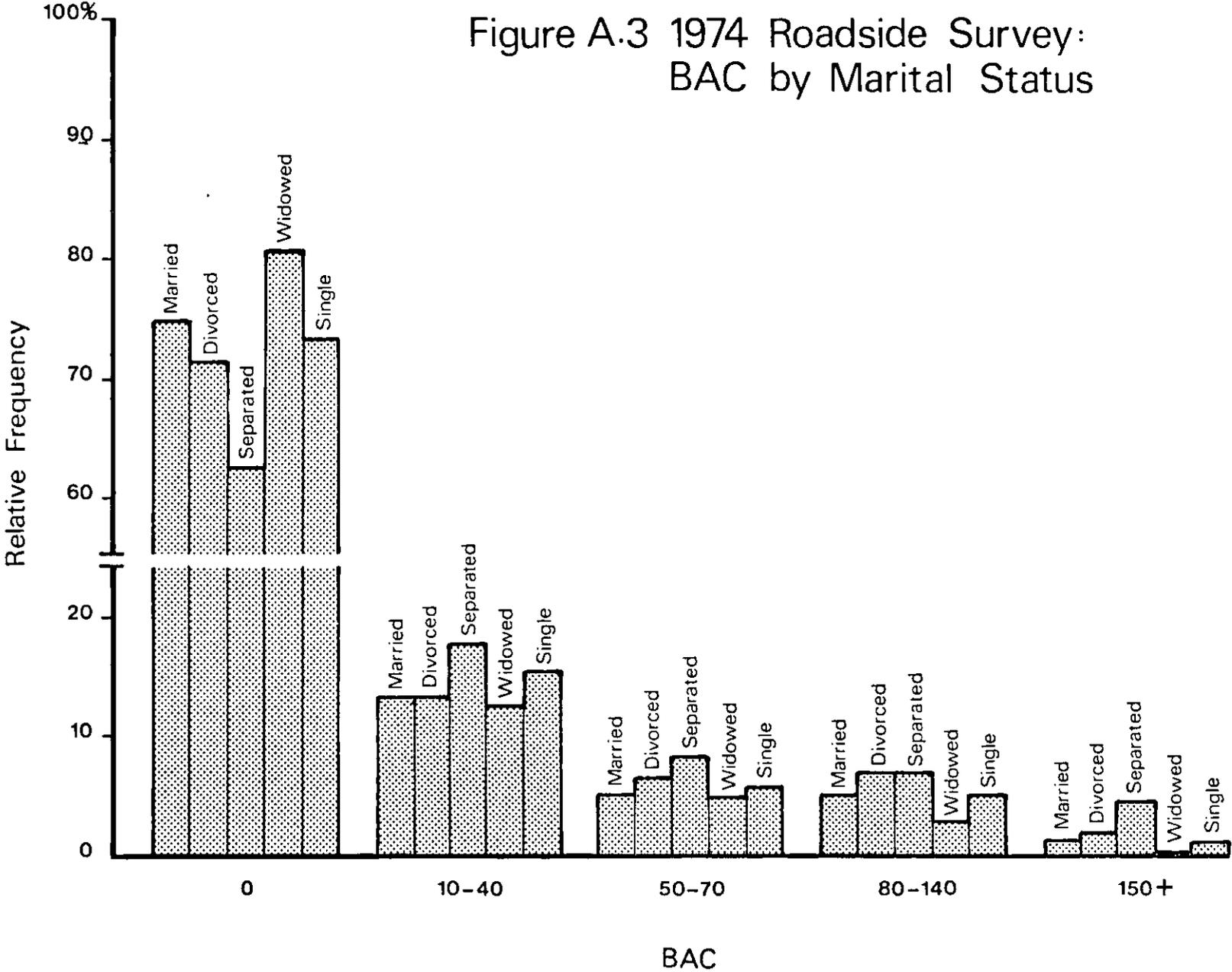


Figure A.4 1974 Roadside Survey:
BAC by Population Area

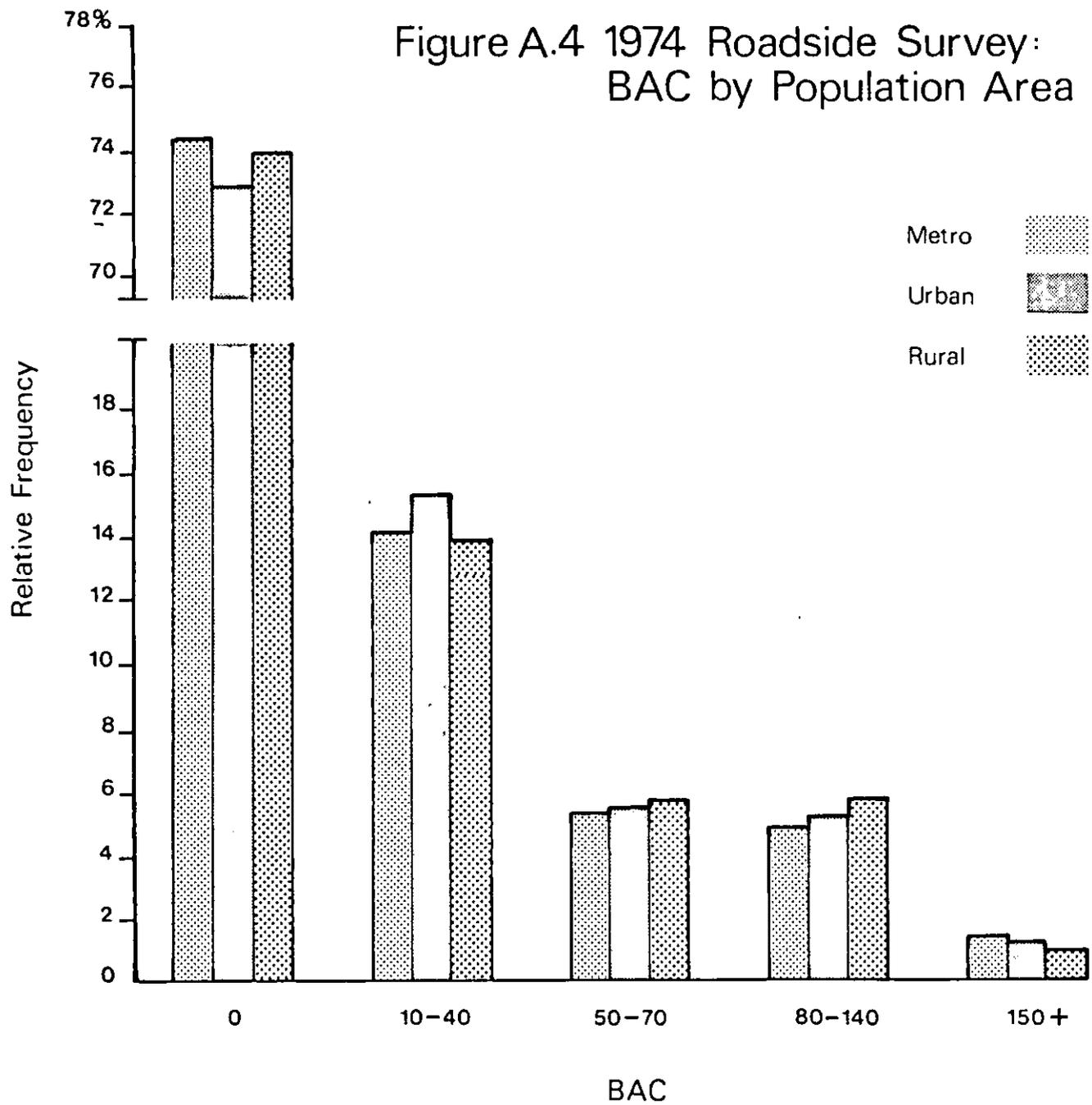
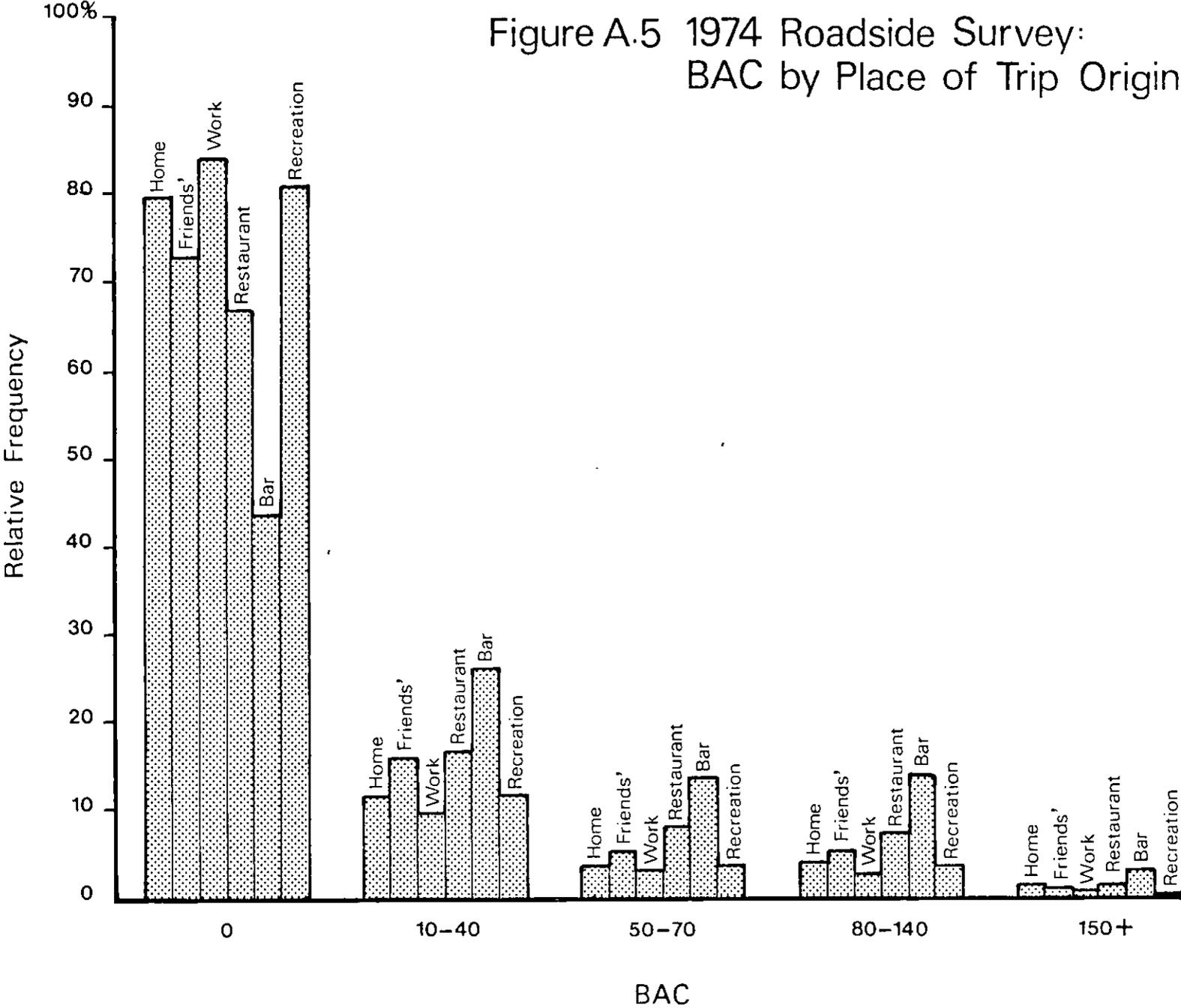


Figure A.5 1974 Roadside Survey:
BAC by Place of Trip Origin



The destination of drivers was also determined in the 1974 Roadside survey. Given the hours of the survey, it is not surprising that close to 75% of respondents were on their way home. Although only 3% of the sample were on their way to a bar or tavern, over 40% of these individuals had been drinking and 9% were legally impaired! Not only is there a substantial portion of drivers leaving drinking establishments with positive BACs, there is also a large number of drivers arriving with positive BACs.

A.6 Summary

Roadside surveys indicate that driving after drinking is relatively frequent behaviour. About 1 out of every 17 drivers on the road between 10:00 p.m. and 3:00 a.m. on weekend nights has consumed sufficient alcohol to be deemed legally impaired (i.e., BAC over 80 mg%).

Driving after drinking is associated with several characteristics of both the driver and the situation. For example, there is a high representation of drinking drivers among: males; individuals between 20 and 34 years old; drivers who are divorced or separated; and individuals coming from a bar or restaurant. No attempt has been made to combine these characteristics into a "profile" of the "typical" drinking driver. Rather, these characteristics are simply those that have been identified among drinking drivers stopped at roadside.

APPENDIX B

**The Characteristics of Persons Arrested and
Convicted of Alcohol-Impaired Driving****B.1 Introduction**

This appendix describes the characteristics of persons arrested and convicted of alcohol-impaired driving. The extant scientific literature was reviewed on basic demographic variables such as age, sex, education and occupation, as well as alcohol-relevant variables such as drinking patterns and BAC on apprehension, and other driver characteristics including personality, driver behaviour and accident involvement. A brief discussion of the recidivist drinking driver is also provided at the end of this appendix.

B.2 Methodological Considerations

Several studies have been made in this area, so at least some information is available on the general characteristics of drivers arrested and convicted of alcohol-impaired driving. Unfortunately, the existing studies often differ in methodology, particularly in terms of the nature of the samples investigated. For example, various subgroups of drivers have been the focus of attention: convicted alcohol-impaired drivers (Mercer 1983); police-detected drinking drivers (Vingilis 1982); drivers taken into custody on suspicion of driving while impaired or intoxicated by alcohol (Coldwell and Grant 1962); persons arrested for driving while intoxicated (Shults et al. 1979; Hyman 1968); suspected drunk drivers (Lindbohm et al. 1980)--making comparisons among studies difficult. As well, the studies employ different case-selection methods, raising serious questions about the representativeness of the study sample and the generalizability of the results. Accordingly, some caution should be taken with respect to the universality and comparability of the findings of these studies. Bearing in mind such caveats, we summarize findings from the literature below.

B.3 Alcohol Use by Drinking Drivers

B.3.1 Drinking patterns. Ever since the term "drunk driver" was coined, the focus of concern has been directed towards the "drunk"--the problem drinker who also happens to drive. Although the stereotype of the "killer drunk" behind the wheel of a car seems rarely appropriate, research verifies that alcohol problems are often overrepresented among those convicted of drinking and driving. Numerous methods and measures have been employed to determine the extent of an individual's involvement with alcohol, for example, BAC at time of arrest; questionnaires; physiological tests, and clinical interviews. Whatever method is used, the diagnosis of alcoholism or problem drinking is a difficult one and is often influenced by subjective judgements and theoretical orientation. Jellinek (1960) termed alcoholism as "any use of alcoholic beverages that causes any damage to the individual, or society, or both" (p. 35). By this definition, anyone who is arrested for impaired driving qualifies to some extent. The fact that one's drinking has brought that individual to the attention of the authorities must be regarded as a sign or symptom of the inappropriate use of alcohol on at least one occasion. On this basis, an impaired-driving conviction might be seen as an early indicator of alcohol abuse and early intervention programmes should be considered for all such individuals.

Depending on the population studied and on the diagnostic criteria employed, anywhere from 4% to 87% of convicted drinking drivers exhibit symptoms of alcoholism or problem drinking (Vingilis 1983). One of the most consistent findings in descriptive studies of drinking drivers is the preponderance of individuals displaying signs of serious alcohol involvement (Casper and Mozerski 1968; Hyman 1968; Steer, Fine and Scoles 1979; Yoder and Moore 1973; Zung 1979). In a recent review of the representation of alcoholics among drinking drivers, Vingilis (1983) estimates that 30-50% of drinking drivers would be considered alcoholics. This estimate is based on a general, nonspecific definition of alcoholism; alterations in the definition would produce variations in the proportion of drinking drivers deemed alcoholics. Vingilis concluded that alcoholics contributed to the population of drinking

drivers, but they were not considered to be one and the same. Zylman (1974, 1975, 1976) has argued that the focus should not be restricted to alcoholics, but rather researchers should attempt to identify a more general group of high-risk drivers whose deviant behaviour leads to crash involvement with or without alcohol. Zylman suggests that alcoholic drivers are a small subset of this more general population.

Studies that have examined the usual or typical drinking practices of convicted impaired drivers find that these individuals report consuming considerably more alcohol on more frequent occasions than social drinkers (Duncan and Vogel-Sprott 1978; Steer, Fine and Scoles 1979). Interestingly, there was little difference in the amount typically consumed as compared with the amount reportedly consumed on the occasion of arrest. This would indicate that the occurrence of the arrest was the unusual event rather than the drinking behaviour per se.

B.3.2 Blood alcohol concentration on apprehension. From the available Canadian research, it is very apparent that the typical drinking driver who is apprehended by the police has a BAC well in excess of the statutory limit (i.e., over 80 mg%). In a study by Mercer (1983), the average BAC on arrest was 173 mg%, with 31% of drivers registering between 80-140 mg%, 35% between 141 and 180 mg% and the remaining 34% above 180 mg%. The data supplied by the Department of Justice on over 20,000 drivers arrested for drinking and driving in Canada in 1982 reveals that the average BAC of these individuals was 172 mg%. Approximately 25% of offenders had a BAC between 80 and 150 mg%, 36% were between 150 and 200 mg% and 31% had a BAC in excess of 200 mg%. Slightly more than 6% of these individuals were apprehended with a BAC less than the legal limit.

The information provided by the Department of Justice permitted some interesting comparisons on the circumstances of arrest. In some jurisdictions it was possible to determine whether the individual came to the attention of the police because of an accident, a random roadside check, or through routine enforcement by patrol officers. Table B.1 presents the distribution of BAC by the different enforcement

techniques. (Figure 3 in Section 3.1 presents these same data graphically.) By far the majority of offenders (74%) were apprehended through routine surveillance by patrol officers. The greatest proportion of apprehended drinking drivers had a BAC in excess of 150 mg% regardless of enforcement practice. However, among those apprehended in random spotchecks, there was a much higher proportion of individuals with BACs between 80 and 140 mg% compared to the other two types of enforcement. In fact, the average BAC of the random spotcheck group (153 mg%) was significantly less than both the accident-involved group (mean BAC = 178 mg%) and the routine enforcement group (mean BAC = 172 mg%).

TABLE B.1

**Distribution of BAC among Individuals Apprehended for
Drinking and Driving by Different Enforcement Methods***

<u>BAC</u>	<u>ROUTINE</u>	<u>ACCIDENT</u>	<u>RANDOM</u>	
0	32 (1.0)	13 (1.4)	0 (0)	
10-40	20 (0.6)	9 (1.0)	1 (0.4)	
50-70	61 (1.8)	17 (1.8)	3 (1.3)	
80-140	697 (20.9)	168 (17.8)	94 (41.8)	
150-190	1123 (33.6)	302 (31.9)	89 (39.6)	
200+	937 (28.1)	310 (32.8)	34 (15.1)	
Refused	467 (14.0)	126 (13.3)	4 (1.8)	
TOTAL	3337 (74.0)	945 (21.0)	225 (5.0)	4507 (100.0)

* Included only these jurisdictions which report accident involvement and random checks for drinking drivers. All other cases are included as routine enforcement.

B.4 Basic Demographic Characteristics

B.4.1 Age and sex. Canadian studies from the early 1960's indicate that apprehension for alcohol-impaired driving was almost exclusively a male domain. For example, in a study of drivers taken into custody on suspicion of impaired driving in Ottawa, Coldwell and Grant (1962) reported that only 1% of those charged were female. By the 1970's, male overrepresentation had only slightly diminished as shown in an evaluation study of the Alberta Impaired Drivers Program (Zelhart et al. 1975) in which males comprised 96.1% of those persons convicted of impaired driving. More recently, in an analysis of police and court records of all legally impaired drivers charged in 1980 (N=1,531) in 12 RCMP detachments on Vancouver Island, Mercer (1983) found that males still predominated among apprehended impaired drivers. This finding is similar to other recent studies conducted in Canada. For example, in a three-year study of nighttime police-detected drinking drivers in Etobicoke, Vingilis (1982) reported that males comprised 93.8% of drivers who failed the A.L.E.R.T. test (i.e., BAC over 100 mg%).

Thus, while the more recent data discussed above indicate that 9 out of 10 apprehended drivers are male, female representation has gradually increased over the 20 year period. Comparisons to studies on female drinking and driving patterns, as well as methods of detection and enforcement over time, would assist in explaining this increase.

The mean age of the arrested and convicted alcohol-impaired drivers is about 30 to 35 years of age (Mercer 1983; Yoder 1975; Hyman 1968; Gabrynowicz et al. 1977; Birrell 1970). In the Mercer study (1983), the average age of male drinking drivers was 33 years; the average age of the females was 35 years. A comparison of age and sex categories in the study revealed "no important differences between the proportion of males in each category and the proportion of females in each category". Accordingly, the age distribution for both sexes is provided in Table B.2.

TABLE B.2

**Arrested and Convicted Alcohol-Impaired Drivers
by Age Group**

<u>Age Group</u>	<u>Percentage</u>
15 - 19	11.4
20 - 24	22.4
25 - 29	15.3
30 - 39	23.0
40 - 49	13.0
50 - 59	10.2
60 - 69	3.7
70+	1.0

Source: Mercer 1983

The data show that 61% of arrested drivers were between 20 and 39 years old. Generally, other Canadian studies reveal similar results (Coldwell and Grant 1962; Zelhart et al. 1975; Quinn et al. 1977; Department of Justice 1983) as do studies in the United States (Fine et al. 1974; Hyman 1968) and Australia (Robertson 1972; Gabrynowicz 1977). These studies also suggest that the youngest and oldest groups of drivers are least likely to be apprehended for drinking and driving.

Several studies have indicated that the BAC distribution varies with the age of the driver. This is illustrated in Table B.3 which presents the distribution of BAC among apprehended drivers of different ages. (The information contained in this table is illustrated in Figure 6 in Section 3.1.) Drivers aged 19 or less had the largest proportion of BACs between 80 and 140 mg%. By contrast, drivers aged 35 and over were more often apprehended at a BAC exceeding 200 mg%. Therefore, young drivers are more likely to be apprehended at "low" to "moderate" BACs whereas older drivers were more often arrested with exceptionally high BACs.

TABLE B.3

**Distribution of BAC Among Apprehended Drinking Drivers
of Different Ages**

<u>BAC</u>	<u>Age Groups</u>								
	<u>16,17</u>	<u>18,19</u>	<u>20-24</u>	<u>25-34</u>	<u>35-44</u>	<u>45-54</u>	<u>55-64</u>	<u>65+</u>	
Under 80	22 (15.4)	30 (6.0)	72 (4.8)	61 (3.4)	21 (1.9)	15 (2.5)	10 (4.0)	1 (1.6)	
80-140	65 (45.4)	204 (40.5)	446 (29.8)	391 (21.6)	157 (14.7)	110 (18.0)	42 (16.6)	15 (23.4)	
150-190	42 (29.4)	167 (33.1)	583 (39.0)	633 (35.0)	340 (31.9)	163 (26.6)	87 (34.4)	33 (51.6)	
200+	12 (8.4)	92 (18.2)	320 (21.4)	565 (31.3)	436 (40.9)	257 (42.0)	94 (37.1)	13 (20.3)	
Refused Test	2 (1.4)	11 (2.2)	75 (5.0)	158 (8.7)	113 (10.6)	67 (10.9)	20 (7.9)	2 (3.1)	
TOTAL	143 (2.4)	504 (8.5)	1496 (25.2)	1808 (30.4)	1067 (17.9)	612 (10.3)	253 (4.3)	64 (1.1)	5947 (100.0)

Source: Department of Justice 1983

Similar findings have been reported by Lindbohm et al. (1980) in Finland, Shults et al. (1979) in Arkansas as well as Fleming (1975) and Birrell (1970) in Australia.

B.4.2 Occupation and education. Little information is available on the occupation of arrested and convicted alcohol-impaired drivers. In those few studies that do consider occupational class, the blue collar worker consistently accounts for the majority of apprehended drivers. For example, in Finland, Lindbohm et al. (1980) found that more than half of the cases of suspected male drunk drivers were skilled manual workers (57.5%); 30% comprised unskilled or non-occupational persons. The study reported that among female arrestees, most were working in offices or comparable places (25%), had a service profession (13%) or were not employed outside of the home (22%).

In a study of 4406 drivers tested for alcohol during the first 3 months of 1974 in New South Wales, Australia, Fleming (1975) reported 37% and 34% of the apprehended drivers were unskilled and skilled, respectively. Similarly, in Victoria, Australia; Santamaria (1975) found that 75% of apprehended drivers were blue collar workers and Raymond (1970) reported blue collar workers represented 69% of male drivers apprehended in Melbourne.

Finally, with respect to Canadian data, Coldwell and Grant (1962) have relevant, albeit somewhat dated, findings on occupational classes and age. They report that persons classed as skilled and unskilled labourers, clerks, and personnel in protective services (mostly Armed Services) account for nearly 70% of individuals aged 25-54, 80% of persons 24 and under and 56% of persons 55 and over.

The review of the literature suggests that a minority of arrested and convicted alcohol-impaired drivers have completed high school. This observation is illustrated in Table B.4.

TABLE B.4

**Formal Education of
Apprehended Drinking Drivers**

<u>Years Completed</u>	<u>Percentage</u>
less than 7	5.8
7 - 9	33.9
10 - 12	52.4
13 - 14	4.7
15 - 16	2.7
17+	0.6

Source: Zelhart et al. 1975.

Zelhart et al. (1975) showed that 33.9% and 52.4% of convicted impaired drivers in Edmonton completed 7 - 9 and 10 - 12 years of formal education, respectively. Only 8% of the cases had greater than 12 years of

formal education. More recent work in the United States (Zung 1979) had similar findings, as over 50% of persons arrested for DWI in this study had completed 9 to 12 years. Yoder and Moore (1973) also report that 75% of convicted impaired drivers in their study sample had at least some high-school education.

B.4.3 Personality characteristics. "A man drives as he lives." If this adage is true, then it would seem reasonable to suggest that anyone who is encountering problems with respect to their driving is probably facing difficulties in other aspects of their lives as well. Such suggestions have led to the hypothesis that among convicted drinking drivers, there may exist an identifiable personality or behavioural style of which drinking and driving is merely one aspect.

Selzer and his colleagues (Selzer 1961; Selzer et al. 1963) played a large role in pioneering this type of work. These authors have reported extremely high rates of alcoholism and psychiatric disorders among impaired drivers. Although their work can be criticized along several dimensions (including an over-inclusive diagnosis of alcoholism and over-zealous psychiatric evaluations), it has served to prompt others to at least consider the hypothesis that some impaired drivers represent a deviant group that requires special consideration.

Some common themes have emerged from research aimed at identifying personality characteristics associated with impaired driving. The high incidence of divorce/separation among offenders has been interpreted as evidence of poor social integration or a form of social alienation (Cosper and Mozersky 1968). Others have focused on drinking in response to chronic stress (Yoder 1975; Yoder and Moore 1973). The incidence of problem drinking was thought to reflect an inability to cope with stress, restlessness and anxiety. Using standardized psychological tests as well as a control group, McLean and Campbell (1977) found indications of personality maladjustment in a group of convicted impaired drivers. In particular, offenders were characterized as being irresponsible, impulsive, rebellious and were less able to cope with social and personal anxieties. Meck and Baither (1980) reported that young offenders exhibited high levels of perceived maladjustment and

approximately 80% of this group was subsequently recommended for out-patient psychotherapy.

In a recent review of this area of research, Donovan, Marlatt and Salzberg (1983) state that the profile of the high-risk driver that begins to emerge is that of an unsocialized, aggressive, impulsive individual who exhibits signs of emotion lability, low personal efficacy, lack of control over significant life events, and a relative deficiency of skills to deal with stress and conflict. Both long-standing personality traits and acute emotional states have been identified as factors contributing to accident involvement. The consumption of alcohol, which is often motivated by acute stress (e.g., Jung 1977), can interact with personality traits to produce even greater risk. This interaction varies with age and sex creating a more complicated situation.

The incidence of psychological "pathologies" among convicted impaired drivers lends credence to the suggestion that alcohol-related driving offences can represent a symptom of more basic emotional problems. Perhaps research, in time, will help clarify the extent and nature of this type of problem. In the meantime, in designing sanctions and countermeasures, we should be aware of the types of problems experienced by these individuals so that we may be in a better position to deal effectively with them.

B.5 Driving Variables

B.5.1 Driving record. An alternative approach to the impaired-driver problem is to examine the situation from the perspective of the "impaired problem-driver" (Simpson 1977). This compelling alternative hypothesis requires examining the extent to which the convicted impaired-driver population is composed of individuals who engage in poor driving behaviour and who also happen to use alcohol.

In a study of 1531 arrested impaired drivers in B.C., Mercer (1983) found 62% had 1 or more previous noncriminal traffic violations; 37.7% had 1 or more previous criminal driving convictions (including impaired driving); and 19.1% had had their licence suspended at one time. Denberg (1974) studied the driving records of over 5000 Ontario drivers convicted of impaired driving and found that less than 1% had that conviction as the only entry on their record. In comparing previous offenses (excluding speeding), Raymond (1971) found Australian impaired drivers three times more likely than a control group to have received traffic citations and ten times more likely to have been charged with a "serious" traffic offence. Consistent with the notion of poor driving record, several researchers (Maisto et al. 1979; Perrine 1974) have noted that this group has a higher rate of traffic accident involvement than expected among drivers in general.

This literature gives the impression that high-risk driving behaviours of the type that come to the attention of the police are overrepresented among persons convicted of impaired driving. There is also some evidence to suggest that drink-drive offenders who exhibit poor driving behaviour preceding their drinking-driving conviction continue to do so afterwards (Maisto et al. 1979). Perhaps such individuals, by nature of their poor driving habits, are more likely to be apprehended. Nevertheless, this evidence in favour of the "problem-drivers-who-drink" hypothesis should be interpreted with considerable caution. The issue remains unresolved and poorly investigated.

B.5.2 Accident involvement. A few studies compare apprehended alcohol-impaired drivers involved in accidents with apprehended drivers not involved in accidents. In the Mercer study (1983), about 23% of the cases were involved in accidents. An earlier study in Nova Scotia of drivers requested to give a breath sample for analysis of BAC (Quinn et al. 1977) reported a similar finding, with about 20% of the legally impaired drivers involved in accidents. By contrast, Zelhart et al. (1977) found that in 34% of the cases of individuals convicted of impaired driving in Edmonton, the DWI citation resulted from a police investigation of an automobile accident. The differences noted above in

accident-involved persons convicted of alcohol-impaired driving likely result from the method of detection and enforcement in the study community (Zelhart et al. 1977). In the Mercer (1983) study, a comparison of the characteristics of the accident-involved and nonaccident-involved drivers revealed no differences in terms of drivers' sex, age, marital status, BAC, previous history of violations, and the age or type of vehicle driven.

B.6 Recidivists

From the numerous studies surveyed, there is a general concensus that recidivists comprise about 15% (range = 10-38%) of the population of impaired drivers. Homel (1981) speculated that, since the introduction of breathtesting instruments, the proportion of recidivists has been increasing over time.

In general, recidivists are older individuals (i.e., over 21), have blue collar occupations, have more traffic offences on their records, and have been involved in more traffic accidents (Denberg 1974; Reid and Harding 1978). The notion that the "killer drunk" (e.g., the alcoholic driver with numerous previous convictions for impaired driving) is responsible for a great percentage of traffic fatalities does not have firm basis. Two studies have specifically addressed this issue by examining the records of impaired drivers responsible for fatal crashes. Only 11.1% of impaired drivers responsible for fatal crashes were found to have previous convictions in Alberta (Bako, MacKenzie and Smith 1977); only 9% of culpable drinking drivers in New Zealand were recidivists (Bailey and Winkel 1981).

If one impaired-driving conviction is viewed as presumptive evidence of problem drinking, two convictions must surely confirm any suspicions. A high BAC indicates the consumption of a large quantity of alcohol on one occasion. The individual may have simply exercised poor judgment on the

occasion by attempting to drive. However, subsequent high BACs are evidence that excessive drinking is not unusual, and the individual is probably showing other signs of problem drinking as well. In fact, studies have shown that recidivists actually have higher BACs than first offenders (Bailey and Winkel 1981; Yoder and Moore 1973). The forms of psychosocial impairments that exist among alcoholic impaired drivers render this group unlikely to respond to traditional sanctions and countermeasure efforts (Selzer and Barton 1977).

If legal sanctions were effective in deterring offenders from repeating their crime, then one would expect the greatest impact to be evident within the first few years after conviction. The fact that most recidivists are charged within 2 years of their original conviction (Reid and Harding 1978) indicates that these individuals are not responding favourably to court-imposed sanctions. The time between each successive reconviction for multiple offenders has also been shown to decrease from an average of 2 years for the second offense to eight months between the third and fourth reconviction (Maisto et al. 1979).

The few available studies on recidivist drinking drivers have two clear messages: 1) traditional sanctions are not effective in dealing with this population; and 2) these individuals are more deviant in both their drinking and their driving practices than impaired drivers as a whole.

Methodological problems in the work on recidivists cannot be ignored. The information available on recidivist offenders has been obtained from cross-sectional studies comparing first and multiple offenders at the same point in time. By definition, recidivists were once first offenders; hence, any discrimination between the two groups is confounded by the time intervening between the first and subsequent offence. The characteristics distinguishing recidivist offenders may have been acquired or exacerbated subsequent to the first offence. In addition, we have no follow-up information on the characteristics of convicted offenders who have not recidivated. Only longitudinal, prospective studies that follow offenders over a period of years will address these issues. At the time of the first conviction it would be

most advantageous to be able to distinguish single offenders from those most likely to recidivate. By identifying the highest risk groups before they commit a subsequent drink-drive offence, sanctions and countermeasures could be designed for and applied to this group in an effort to reduce recidivism.

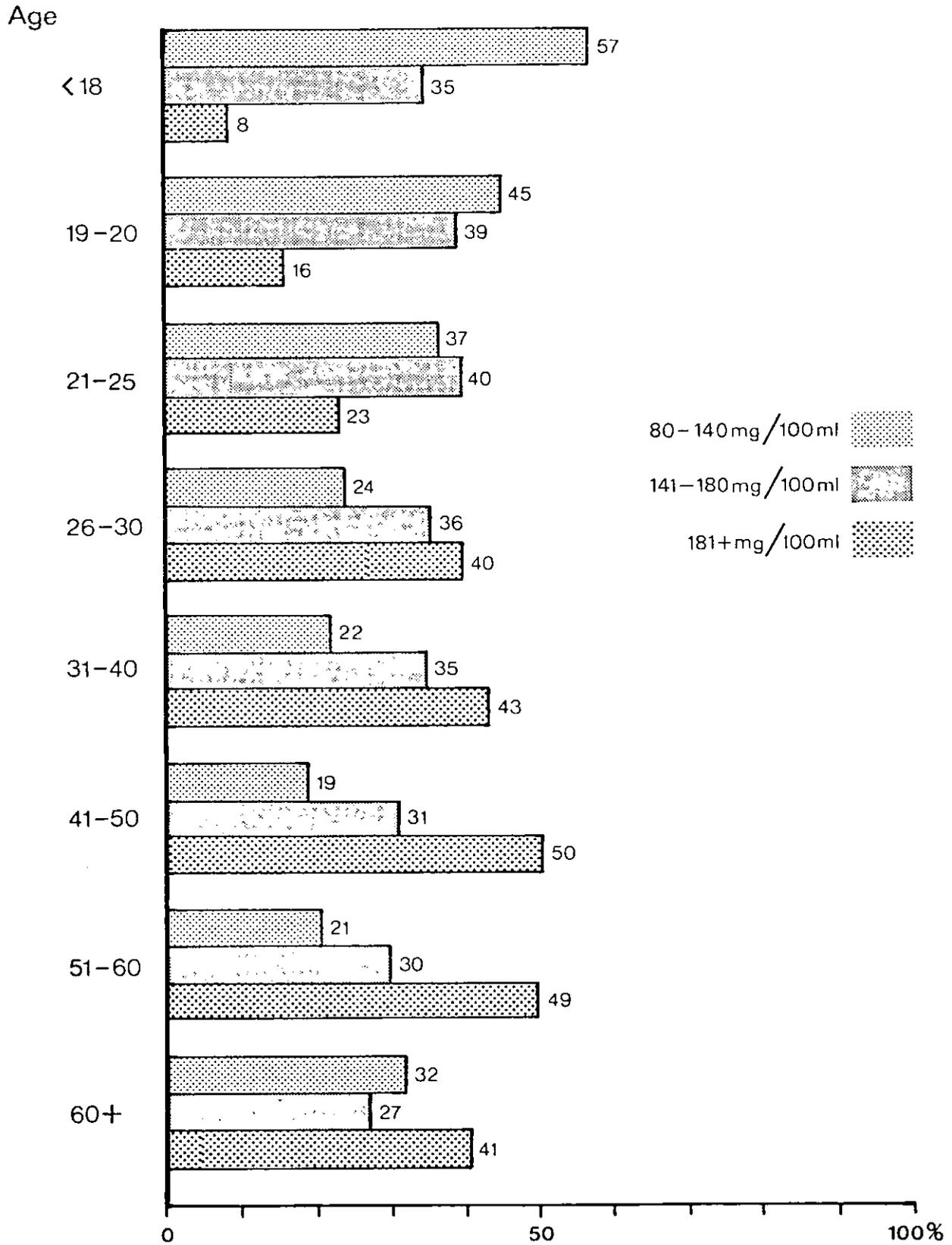
B.7 Summary

The literature on apprehended drinking drivers indicates that the average BAC at the time of arrest is more than double the statutory limit of 80 mg%. As illustrated in Figure B.1, the BAC of apprehended drivers varies as a function of driver age. Young drivers are more likely to be arrested with a low to moderate BAC, whereas in older drivers (aged 26-60) high BACs predominate. Signs and symptoms of problem drinking are very common among arrested impaired drivers with perhaps as many as 50% of offenders affected.

Figure B.2 summarizes reported characteristics of apprehended drivers. Males comprise about 90% of offenders. The proportion of females arrested for alcohol-impaired driving has been increasing steadily over the years. The majority of offenders are between 20 and 40 years old and more likely have at least some high school education and have "blue collar" occupations. The BAC at the time of arrest is probably well in excess of the legal limit. The offender is more often apprehended through routine patrol rather than as the result of an accident or a random spotcheck.

Many offenders exhibit signs of deviant personality traits or lifestyles. Several investigators have suggested that alcohol-impaired driving represents one of several manifestations of a maladjusted, socially deviant individual. Poor driving records are also very common among those arrested for alcohol-related driving offences. This, too, may be a symptom or consequence of the deviant lifestyle that brings these people to the attention of the police.

Figure B.1
Distribution of BAC by Age¹



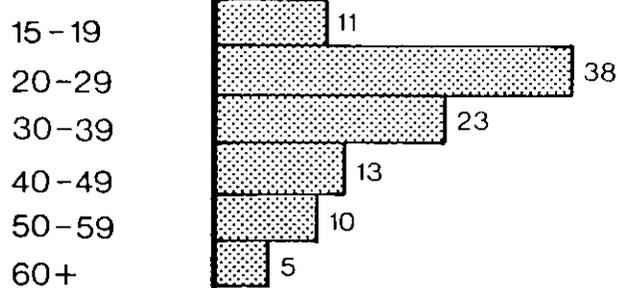
1. Mercer, 1983

Figure B.2 Characteristics of Arrested and Convicted Alcohol-Impaired Drivers

A. Sex¹



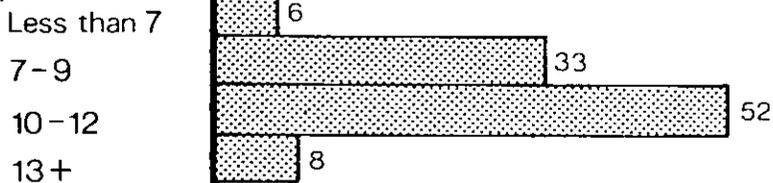
B. Age² (years)



C. Occupation³



D. Education⁴ (school years completed)



E. BAC⁵ (mg/100ml)



F. Accident Involvement⁶



0 50 100%

Recidivist offenders are of special interest because they have been apprehended on more than one occasion. This group tends to be slightly older and more deviant in their drinking and driving habits than first-time offenders. These individuals require special attention as it appears they do not respond to traditional sanctions.

APPENDIX C

THE CHARACTERISTICS OF DRIVERS
INJURED IN ROAD ACCIDENTS

C.1 Introduction

Although we have a tendency to refer to the "drinking-driving problem", drinking drivers who do not crash are a source of concern only because they have a higher risk of being involved in a crash than the average sober driver. The real "problem" is the drinking driver who is involved in a traffic accident. This appendix focuses on the characteristics of drivers involved in road accidents. Similar to the previous appendices, the extant literature was reviewed in an effort to determine who comprises this population. In addition, consideration is given to the characteristics of the crashes in which this group of drivers was involved.

C.2 Methodological Considerations

Studies of accident-involved drivers are constrained by several factors. There are many more traffic accidents than can ever be thoroughly investigated by researchers. In Canada in 1982, there were over 180,000 reported motor vehicle accidents resulting in more than 225,000 injuries (Transport Canada). Obtaining a random, representative sample of accident-involved drivers is not readily accomplished. Hence, most investigators collect data from a selected region. The probabalistic nature of accidents usually prevents researchers from attending the scene. Rather, data is collected from police reports, hospital records, and personal interviews.

The major purpose of interviews with victims is to obtain a breath sample from which blood alcohol concentration (BAC) can be determined. These interviews are limited by the severity of the injuries sustained and the willingness of the individual to participate. Fear of legal reprisals often inhibits cooperation. Nonrespondents introduce a bias into estimates of alcohol use by injured drivers.

Police reports often do not contain any information on the use of alcohol by injured drivers. When this information is recorded, it is generally in the form of a subjective judgement of the degree of alcohol involvement rather than an objective determination of BAC. This type of data is of limited value.

Therefore, in the absence of "ideal" data, we must be content to use that which is available, noting its limitations.

C.3 Alcohol Use by Injured Drivers

Obtaining objective data on the BACs of injured drivers in Canada is limited by the extent to which individuals wish to participate in research studies. Two Canadian studies, one in New Brunswick by the Traffic Injury Research Foundation of Canada (Warren et al. 1982) and the other in British Columbia (Rockerbie 1979, 1981) have been successful in obtaining information, including BAC, from victims injured in motor vehicle accidents. In general, the majority (70%) of injured drivers were found not to have been drinking at the time of the accident. Of those who had been drinking, the proportion of injured drivers increased with rising BAC. Between 16 and 25% of injured drivers had a BAC in excess of the legal limit (i.e., over 80 mg%). The slight discrepancies between the two studies may be attributable to sampling differences, refusal rates, and alcohol testing procedures rather than the result of interprovincial differences.

The Canadian data on injured drivers can be compared with studies from Australia where blood tests are mandatory in some states for all persons treated at hospitals for injuries sustained in traffic accidents. Over a 4-year period (1974-1977), McDermott and Strang (1978) collected the results of blood tests performed on 35,591 injured drivers in Victoria. The results revealed that over 70% of drivers were free of the influence of alcohol at the time of the crash, and 21% had a BAC in excess of the legal limit in that state (i.e., 50 mg%). As in the Canadian studies, the Australian data indicate the proportion of drivers who had been drinking increases with rising BACs. Other studies in both the United

States and Australia reveal similar results (e.g., Ryan et al. 1976; Ryan and Salter 1977; Farris et al. 1977; Strang 1979; Terhune and Fell 1981; Fell 1982).

In response to queries about typical drinking patterns, May and Baker (1977) determined that 51% of drivers injured in alcohol-related crashes could be classified as problem drinkers. This is in contrast to only 5% of drivers injured in nonalcohol-related accidents. Ryan and Salter (1977) examined the drinking patterns of a sample of injured Australian drivers and reported that those with a BAC over the legal limit at the time of the crash tended to drink on two or more occasions per week. Approximately 75% consumed 4 or more drinks per occasion, 20% of whom consumed 13 or more.

C.4 Basic Demographic Characteristics

C.4.1 Age and sex. As was the case in the "At Risk" and "Apprehended" populations discussed in Appendices A and B respectively, male drivers predominate among victims injured in traffic accidents. About 70% of injured drivers are male (McDermott and Strang 1978; Rockerbie 1979; Warren et al. 1982). In addition, numerous studies indicate that males are more likely to be injured at high levels of BAC (e.g., Ryan and Salter 1977a,b; May and Baker 1977; Strang 1979; Terhune and Fell 1981).

The age distribution for both male and female injured drivers is presented in Table C.1. Over half of all injured drivers are between the ages of 20 and 34 years. Young drivers (16 - 19 years old) comprise less than 20% of all injured drivers. It is also apparent from this table that a greater proportion of young male drivers are injured compared to females. In the 20 to 34 year old group, the representation of both sexes is approximately equal.

TABLE C.1

Distribution of Age by Sex of Driver

<u>Age</u>	<u>Sex</u>		<u>Total</u>
	<u>Male</u>	<u>Female</u>	
16,17	23 (4.5)	12 (6.0)	35 (4.9)
18,19	78 (15.2)	16 (8.0)	94 (13.2)
20-24	135 (26.3)	46 (23.1)	181 (25.4)
25-34	136 (26.5)	52 (26.1)	188 (26.4)
35-44	45 (8.8)	23 (11.6)	68 (9.6)
45-54	38 (4.4)	25 (12.6)	63 (8.8)
55-64	24 (4.7)	14 (7.0)	38 (5.3)
65+	34 <u>(6.6)</u>	11 <u>(5.5)</u>	45 <u>(6.3)</u>
	513 (72.0)	199 (28.0)	712 (100.0)

Source: Warren et al. 1982

Studies that had sufficiently large samples necessary to examine the BAC distribution by driver age indicate that a large proportion of injured drivers with a positive BAC were under the age of 25 (May and Baker 1977). However, it should also be noted that of drinking drivers who are injured, young drivers are more likely to have lower BACs than older drivers (Cosper and Mozersky 1968; Farris et al. 1977; Williams 1982).

C.4.2 Occupation. Very few studies report data on the occupational status of injured drivers. In a study of 106 drivers injured in

alcohol-related accidents in New Mexico, May and Baker (1977) reported that 76% of these individuals were included in the two lowest socio-economic employment categories typified by minor clerical staff, service workers, semi-skilled workers and manual labourers. Many had changed jobs frequently in the past five years.

C.4.3 Marital status. In the New Mexico study, May and Baker (1977) found 32% were married, 42% were single and 26% were divorced or separated. The data are too limited to indicate a pattern but there is some indication of an increase in separated and divorced drivers injured at higher BACs.

C.5 Crash Characteristics

C.5.1 Accident type. Motor vehicle accidents can be categorized according to whether the crash involved either a single vehicle or multiple vehicles. Because only one driver is involved in a single vehicle accident, the attribution of responsibility among all contributing factors is more easily determined. Hence, alcohol-related single vehicle accidents are often considered to be a more valid indicator of the role of alcohol in motor vehicle accidents.

Studies of injured drivers reveal a high proportion of single vehicle accident involvement among drivers who had been drinking. Terhune and Fell (1981) found 16.6% of nondrinking injured drivers had single vehicle accidents compared to 66.2% of drivers with a BAC in excess of 100 mg%. Similar results were reported by May and Baker (1977) who found 68% of alcohol-involved drivers sustained their injuries in single vehicle accidents. Drivers with high BACs had a higher proportion of single vehicle accidents.

C.5.2 Responsibility. Research by Terhune and Fell (1981) showed that of 273 drug-free drivers injured in Rochester, New York 34.4% were considered culpable. In the same study, 53.9% of the drivers below the legal limit in New York (i.e., 100 mg%) were responsible for their injury-producing accidents. The proportion increased to 73.8% for those

over the legal limit. May and Baker (1977) showed that a much larger proportion (94%) of legally impaired drivers were responsible for their alcohol-involved injury accidents. Research performed by Farris et al. (1977), a study involving 2,481 injured drivers in Alabama and California, found that culpability increased as alcohol involvement increased. At BACs of 150 mg% they determined that, on average, a driver was 29 times more likely to be responsible for an injury accident; at a BAC of 170 mg% the relative risk was 55 times higher than that of the average sober driver.

C.5.3 Injury severity. An important observation by Warren et al. (1982) in the New Brunswick study concerns the relationship between the BAC of the driver and the severity of the injuries sustained. Table C.2 presents the distribution of BAC by severity of injury, using the Abbreviated Injury Scale (AIS).

TABLE C.2
Distribution of BAC Among Injured Drivers
by Severity of Injuries Sustained

<u>Injury Severity</u>	<u>Blood Alcohol Concentration (in mg%)</u>				<u>TOTAL</u>
	<u>0-19</u>	<u>20-80</u>	<u>81-150</u>	<u>Over 150</u>	
AIS-0 (No injuries)	278 (83%)	19 (6%)	25 (7%)	14 (4%)	336 (100)
AIS-1 (Minor)	710 (73%)	75 (8%)	108 (11%)	82 (8%)	975 (100)
AIS-2 (Moderate)	138 (64%)	19 (9%)	29 (13%)	29 (13%)	215 (100)
AIS-3 (Serious)	42 (65%)	5 (8%)	8 (12%)	10 (15%)	65 (100)
Total	1168	118	170	135	1591

As can be seen in Table C-2, as the victim injury severity index increases from AIS-0 (no injuries) to AIS-3 (serious injuries), so too does the proportion of drivers who had been drinking or were over 150 mg%. This finding has also been noted in a study by House et al. (1982).

Similar observations were made by Fell (1982) in the U.S. NASS data, where 25% of all serious injury accidents (AIS-3) involved intoxicated drivers or pedestrians compared with 18% of injury accidents as a whole (all severities). As well, Farris et al. (1977) showed that at BACs of 150 mg%, drivers were 14 times more likely to be involved in injury producing accidents than a sober driver; at 170 mg% they were 27 times more likely. These studies, among others, indicate that injury severity increases as a function of increasing BAC.

C.6 Summary

The literature shows that approximately 30% of the injured drivers have been drinking. Of those who had been drinking, roughly 20% were below the legal limit and 80% were above. It was found that as age increased there was a corresponding decrease in the number of injured drivers. Approximately half of the injured drivers are below 25 years of age; among nondrinking drivers, accident rates peak at age 18-20; among drinking drivers the peak occurs at 22-24.

Drivers who are injured in automobile accidents are predominantly male. Female involvement is greater among nondrinking and low BAC subgroups.

Studies reporting marital status are few. The indicated divorced or separated drivers with high BACs were overrepresented in injury accidents.

Studies that examined occupational status indicated that a majority of injured drivers had middle level or lower occupations, including a substantial number of housewives. Alcohol-involved injured drivers were represented to a large extent by individuals with lower level occupations and high job turnover.

Male drivers are more likely than females to be injured in an automobile crash at high BACs. Over half of all injured drivers were between the ages of 20-34 years. Young drivers were more likely to have a positive

BAC than older drivers, but older drivers were more likely to have a high BAC.

Drinking drivers have a tendency to be involved in a large number of single vehicle accidents and are more likely than nondrinking drivers to be judged responsible for the crash. It was also found that injury severity increases with BAC, indicating that it is more likely for a driver with a high BAC to suffer more severe injuries than a sober driver.

APPENDIX D

**The Characteristics of Drivers Fatally Injured
In Road Accidents**

D.1 Introduction

This appendix contains descriptive information on drivers killed in motor vehicle accidents. The scientific literature was reviewed in order to provide a description of the characteristics of fatally injured drivers including basic demographic variables such as age, sex, occupation as well as alcohol-relevant variables. In addition, consideration is given to the temporal and dynamic characteristics of fatal crashes.

The Fatality Database of the Traffic Injury Research Foundation of Canada is the source of a great deal of the information contained in this appendix. A thorough analysis of the trends in Canadian traffic fatalities over the ten year period 1973-1982 was the focus of another report (also prepared for the Department of Justice) entitled: Alcohol and Fatal Road Accidents in Canada: A Statistical Look at its Magnitude and Persistence. It is not the intention of this appendix to duplicate that report, but rather to draw upon the information contained therein in order to provide a description of fatally-injured drivers.

D.2 Methodological Considerations

Unlike property damage or personal injury accidents, by virtue of the fact that at least one life was lost, fatal traffic crashes necessitate a complete and thorough investigation, often including autopsies of deceased persons. By linking the various sources of information (i.e., police reports, hospital records, coroners' reports), it is possible to obtain a rather detailed description of the accident and the victims. There remains, however, much information about fatally injured drivers which cannot be readily attained unless one employs the techniques of "psychological autopsy" (e.g., Finch and Smith 1970). This is seldom

done, leaving researchers with descriptive demographics such as age, sex and BAC.

Testing for the presence of alcohol in fatally injured accident victims is becoming more commonplace as society attempts to determine the extent of alcohol-involvement in fatal traffic crashes. A common difficulty in reporting the results of alcohol detected in traffic crash victims is the selection of an appropriate convention to express the frequency (or percent) of victims who are found to have a positive BAC. This difficulty arises because not all victims are tested for the presence of alcohol. Therefore, one may choose to express the frequency of victims positive for alcohol as a percentage of either (1) the total number of victims or (2) the total number of victims tested for alcohol. The issues involved and the resulting implications are not trivial (Warren and Simpson 1980). The former method makes the assumption that all victims not tested have a BAC equal to zero and thus represents a minimum frequency of alcohol involvement; the latter method makes no such assumptions and therefore provides a reasonable upper limit and possibly a more accurate indicator of the degree of alcohol involvement in fatal motor vehicle accidents.

D.3 Alcohol Use by Fatally Injured Drivers

Numerous studies have repeatedly demonstrated that alcohol is involved in a large proportion (i.e., 50-60%) of driver fatalities (e.g., Traffic Injury Research Foundation 1975, 1984; Simpson et al. 1977; Perrine et al. 1974; Fell 1982; Hendtlass et al. 1980; Rosenburg et al. 1974). Table D.1 presents the distribution of BAC among fatally injured drivers in seven Canadian provinces over the ten-year period 1973-1982. Over half of all fatally injured drivers tested were found to have a positive BAC. Approximately 10% were below the legal limit (i.e., under 80 mg%) whereas 45-50% had a BAC in excess of the statutory limit. Of those drivers who had been drinking, about 80% had BACs over the legal limit. The distribution of BAC has not changed appreciably in the past ten years, indicating that the alcohol-crash problem has persisted despite our efforts to reduce its magnitude.

TABLE D.1

DISTRIBUTION OF BAC AMONG FATALLY INJURED DRIVERS¹
(SEVEN PROVINCES)

YEAR	NUMBER OF DRIVERS	NUMBER OF DRIVERS TESTED (% TESTED)	NUMBER OF TESTED DRIVERS BY BLOOD ALCOHOL CONCENTRATION (% OF NUMBER TESTED)				
			ZERO	1 - 49	50 - 80	81 - 150	> 150
1973	1776	1356 (76.4)	568 (41.9)	56 (4.1)	73 (5.4)	233 (17.2)	426 (31.4)
1974	1962	1505 (76.7)	659 (43.8)	91 (6.0)	79 (5.2)	235 (15.6)	441 (29.3)
1975	1862	1480 (79.5)	614 (41.5)	108 (7.3)	81 (5.5)	211 (14.3)	466 (31.5)
1976	1640	1266 (77.2)	517 (40.8)	73 (5.8)	78 (6.2)	182 (14.4)	416 (32.9)
1977	1695	1262 (74.5)	525 (41.6)	89 (7.1)	65 (5.2)	189 (15.0)	394 (31.2)
1978	1601	1209 (75.5)	513 (42.4)	78 (6.5)	50 (4.1)	162 (13.4)	406 (33.6)
1979	1846	1334 (72.3)	566 (42.4)	90 (6.7)	53 (4.0)	191 (14.3)	434 (32.5)
1980	1832	1233 (67.3)	501 (40.6)	85 (6.9)	56 (4.5)	174 (14.1)	417 (33.8)
1981	1879	1400 (74.5)	538 (38.4)	92 (6.6)	47 (3.4)	221 (15.8)	502 (35.9)
1982	1571	1182 (75.2)	474 (40.1)	74 (6.3)	54 (4.6)	171 (14.5)	409 (34.6)

¹Excludes victims of crashes involving bicycles, snowmobiles, and farm tractors.

Traffic Injury Research Foundation of Canada, 1984.

D.4 Basic Demographic Characteristics

D.4.1 Age. Table D.2 presents the distribution of age of fatally injured drivers in seven Canadian provinces (TIRF 1984) and 15 American states (Fell 1982) for the year 1980. Despite the slight differences in the grouping of ages, the two studies reveal very similar age distributions. As can be seen below, drivers between the ages of 20 and 35 comprise close to 50% of all driver fatalities. Young drivers (aged 16-19) and older drivers (over 55) account for approximately the same proportion of driver fatalities.

TABLE D.2

Distribution of Age Among Fatally-Injured Drivers

<u>Seven Canadian Provinces 1980</u>		<u>Fifteen U.S. States, 1980</u>	
<u>Age Group</u>	<u>% of Drivers</u>	<u>Age Group</u>	<u>% of Drivers</u>
under 15	1.4	under 15	0.8
16-19	16.7	16-19	15.3
20-25	25.2	20-24	21.3
26-35	21.2	25-34	27.2
36-45	11.8	35-44	13.6
46-55	8.7	45-54	9.4
over 55	15.0	over 55	12.4

Source: TIRF (1983); Fell (1982)

In analyzing trends over the past ten years (1973-1982), we found that the distribution of age has remained relatively consistent over this period (Beirness et al., 1984). The proportion of young driver (16-19 years) fatalities has decreased slightly over this period, probably reflecting the smaller numbers of licenced drivers in this age group.

The distribution of BAC according to age of driver is presented for each of the years 1973 to 1982 in Table D.3. The proportion of drivers who have been drinking is lowest among young drivers (19 and under), increases among drivers aged 20-45, and then decreases again in older drivers (46 and over). Younger drivers and older drivers were most likely to have relatively low BACs (80 mg% and below) compared to drivers between the ages of 20 and 45 who were most likely to have a BAC in excess of 150 mg%. This distribution has remained relatively consistent over the ten-year period. Similar age distribution have been reported by others as well (e.g., Yaksich 1980; Perrine et al. 1971; Pelz et al. 1975).

Young drivers have been repeatedly identified as a group at particularly high risk for alcohol-related traffic crashes. Consequently, countermeasures have been directed specifically at this group (e.g., raising the drinking age). The data presented indicate that young fatally injured drivers are least likely to have been drinking and least likely to have high BACs at the time of their deaths. Nevertheless, the young drinking driver, even at low BACs, has a very high relative risk of fatal crash involvement (Mayhew et al. 1981).

D.4.2 Sex. Male drivers have always been overrepresented among traffic fatalities, particularly those involving alcohol. In aggregate, male driver fatalities outnumber females by a 6 to 1 margin. Table D.4 presents the proportion of male and female driver fatalities for each year from 1973 to 1982. Of interest, the involvement of female drivers in fatal accidents increased from 1973 to 1982.

The distribution of BAC among fatally injured drivers according to sex is also presented in Table D.4. Again, males are more likely than females to have been drinking and to have high BACs (150 mg% and over) at the time of their deaths. We must note, however, the increasing involvement of alcohol in female driver fatalities.

In a study in Vermont, Perrine et al. (1971) reported that the proportion of male driver fatalities with a BAC over 100 mg% was 37%; the

TABLE D.3

RANGES OF BLOOD ALCOHOL CONCENTRATION ACCORDING TO AGE GROUPS OF DRIVERS¹
(SEVEN PROVINCES, 1973 - 1982)

<u>BAC RANGES</u>		<u>AGE GROUPS OF DRIVERS</u>								<u>TOTAL</u>
		<u>< 16</u>	<u>16-17</u>	<u>18-19</u>	<u>20-25</u>	<u>26-35</u>	<u>36-45</u>	<u>46-55</u>	<u>> 55</u>	
ZERO	N	70	372	507	1125	976	626	640	1133	5449
	(%)	(1.3)	(6.8)	(9.3)	(20.6)	(17.9)	(11.5)	(11.7)	(20.8)	(100)
1 - 49	N	9	72	129	232	121	96	64	112	835
	(%)	(1.1)	(8.6)	(15.4)	(27.8)	(14.5)	(11.5)	(7.7)	(13.4)	(100)
50 - 80	N	10	72	125	194	105	42	35	48	631
	(%)	(1.6)	(11.4)	(19.8)	(30.7)	(16.6)	(6.7)	(5.5)	(7.6)	(100)
81 - 150	N	13	178	356	663	397	144	107	106	1964
	(%)	(0.7)	(9.1)	(18.1)	(33.8)	(20.2)	(7.3)	(5.4)	(5.4)	(100)
>150	N	24	155	425	1229	1102	629	424	307	4295
	(%)	(0.6)	(3.6)	(9.9)	(28.6)	(25.7)	(14.6)	(9.9)	(7.1)	(100)
TOTAL	N	126	849	1542	3443	2701	1537	1270	1706	13174
	(%)	(1.0)	(6.4)	(11.7)	(26.1)	(20.5)	(11.7)	(9.6)	(12.9)	(100)

¹Excludes victims of crashes involving bicycles, snowmobiles, and farm tractors.

Traffic Injury Research Foundation of Canada, 1984.

TABLE D.4

DISTRIBUTION OF BAC ACCORDING TO SEX OF DRIVER¹
(SEVEN PROVINCES)

YEAR	SEX	NUMBER OF DRIVERS (% OF TOTAL)	NUMBER OF DRIVERS TESTED (% TESTED)	NUMBER OF TESTED DRIVERS BY BLOOD ALCOHOL CONCENTRATION (% OF NUMBER TESTED)				
				ZERO	1 - 49	50 - 80	81 - 150	>150
1973	Male	1573 (88.8)	1210 (76.9)	476 (39.3)	47 (3.9)	62 (5.1)	218 (18.0)	407 (33.6)
	Female	198 (11.2)	144 (72.7)	90 (62.5)	9 (6.3)	11 (7.6)	15 (10.4)	19 (13.2)
1974	Male	1720 (87.9)	1326 (77.1)	538 (40.6)	83 (6.3)	74 (5.6)	218 (16.4)	413 (31.1)
	Female	237 (12.1)	175 (73.8)	119 (68.0)	8 (4.6)	5 (2.9)	16 (9.1)	27 (15.4)
1975	Male	1620 (87.1)	1303 (80.4)	498 (38.2)	95 (7.3)	75 (5.8)	192 (14.7)	443 (34.0)
	Female	240 (12.9)	176 (73.3)	115 (65.3)	13 (7.4)	6 (3.4)	19 (10.8)	23 (13.1)
1976	Male	1436 (87.6)	1113 (77.5)	418 (37.6)	65 (5.8)	72 (6.5)	171 (15.4)	387 (34.8)
	Female	203 (12.4)	152 (74.9)	98 (64.5)	8 (5.3)	6 (3.9)	11 (7.2)	29 (19.1)
1977	Male	1410 (83.2)	1064 (75.5)	391 (36.7)	81 (7.6)	57 (5.4)	171 (16.1)	364 (34.2)
	Female	284 (16.8)	197 (69.4)	133 (67.5)	8 (4.1)	8 (4.1)	18 (9.1)	30 (15.2)

associated value for females was 4%. At BACs in excess of 150 mg%, the proportion of male driver fatalities was 24% compared to only 2% for females.

D.4.3 Occupation. In studies that examined the occupations of fatally injured drivers, the blue collar, middle level workers seem to be the most involved. Hendtlass et al. (1980) found that of 356 drivers killed in Victoria, Australia, 58% were blue collar, 22% were white collar, 11% pensioners and 9% were classified "other". In the Vermont study by Perrine et al. (1971), 35% had middle level occupations, 26% upper level, 23% lower and 15% had "other". In the same study, the number of previous employers within the last 5 years was examined; 25% had one, 30% two, 30% three and 15% none. Finally, in research performed by Shaffer et al. (1974) in Baltimore, it was found that 45 of 50 male driver fatalities were employed at the time of their crash.

D.4.4 Marital status. Very few studies investigated the marital status of fatally injured drivers; those that have done so had small sample sizes. Fisher (1976) found 83% of driver fatalities were either married or single and 17% were separated or divorced.

Shaffer et al. (1974) found that of 50 fatally injured male drivers in Baltimore, 38% were married, 38% were single and 24% were separated, widowed or divorced. In Vermont, Perrine et al. (1971) found that 57% of the drivers studied were married, 41% were single and 3% were separated, widowed, or divorced. In the study by Finch and Smith (1970) of 25 drivers killed in Houston, the respective proportions were 40%, 16%, and 44%.

D.4.5 Other Characteristics. Shaffer et al. (1974) reported that of 50 male driver fatalities in Baltimore, many were perceived as "more belligerent, verbally expansive, negative and hyperactive than the normal population, a higher degree of withdrawal, characterized by an outgoing type of social aggressiveness and more than their share of negativism and psychopathology". Shaffer also found that 28% were prone to heavy bouts of drinking. Of 25 drivers killed in Houston, Finch and

Smith (1970) found 20% were classified as normal; 76% has personality disorders; 60% were alcoholics; and 80% had one or more stress-related events prior to the accident. Obviously, the classifications of pathology used were not mutually exclusive.

In the literature there is some contention regarding the number of alcoholics involved in fatal accidents. For example, Perrine et al. (1971) found that drivers killed with a BAC greater than 100 mg% were significantly more likely to be medium to heavy drinkers. By contrast, using a different approach, Brenner (1967) followed 217 alcoholics for 4 to 7 years who were previously in treatment facilities and found 2 (possibly 3) were subsequently killed while driving an automobile.

Finch and Smith (1970) found that of 25 drivers killed in Houston, 16% had no prior traffic arrests but 24% were "blatant psychopaths" characterized as "notoriously reckless and impulsive, reactions when frustrated make them high risk drivers, they had long histories of societal conflict, they had previous traffic offenses and other arrests, callous people requiring immediate gratification and devoid of a sense of responsibility". Previous drink-driving convictions were found in 8% of the drivers.

The literature suggests that drivers killed in automobile accidents have had little previous exposure to legal sanctions. For example, Hendtlass et al. (1980) found that of 356 drivers killed in 1977 in Victoria, Australia, 54% had no previous traffic convictions, 25% had one or two and 21% had three or more. They also found that 91% had no prior drink-drive convictions, 7% had one and 2% had two or three. Additionally, of 424 fatalities studied, 56% were fully licensed, 23% had probationary licenses, 7% had no license, 6% had learner's permits, 5% had conditional licenses and 2% had cancelled licenses. In the Vermont study by Perrine et al. (1971), 73% of fatally-injured drivers had no moving violations in the previous five years, 15% had one, and 12% had two or more. Perrine also found 75% had no licence suspensions, 13% had one and 12% had two or more.

The results of these studies give the impression that many drivers killed in traffic accidents exhibit deviant personality or behavioural traits of some sort. While this serves to isolate a particular high-risk group (or groups), one must be careful not to infer causation from such studies, for a great deal of this information is derived from secondary sources and cannot be considered "hard data" in the absence of validating evidence.

D.5 Driving Variables

D.5.1 Temporal Aspects. Studies indicate that alcohol-related driver fatalities tend to occur during nighttime hours, presumably because this is when the greatest amount of driving after drinking occurs. Table D.5 presents the hourly distribution of fatal crashes according to driver BAC.

TABLE D.5
Temporal Distribution of Driver Fatalities by
Blood Alcohol Concentration, 1981

<u>Time of Day</u>	<u>Blood Alcohol Concentration</u>		
	<u>0</u>	<u>1-80</u>	<u>over 80</u>
8:00-14:00	32.4%	16.9%	6.2%
14:00-20:00	31.8%	24.7%	29.3%
20:00-2:00	18.9%	41.6%	44.1%
2:00-8:00	15.9%	16.9%	15.4%
Unknown	<u>1.5%</u>	<u>0.0%</u>	<u>5.0%</u>
	100.0	100.0	100.0

Source: Traffic Injury Research Foundation of Canada, 1983

As indicated in the above table, the greatest proportion of alcohol-involved driver fatalities occur between 8 p.m. and 2 a.m. In contrast, most nonalcohol involved fatalities occur during daytime hours (8:00-20:00). These results are in general agreement with those

reported by others (Baker and Spitz 1970; Rosenberg et al. 1974; Simpson et al. 1978; Buhlman 1981).

The daily distribution of driver fatalities by BAC is presented in Table D.6. The majority of driver fatalities, regardless of BAC, occur on the weekends (i.e., Friday, Saturday, and Sunday). This trend is even more pronounced with alcohol-related driver fatalities. Among fatalities in which alcohol is not involved, the daily distribution is more regular with every day of the week accounting for 10-15% of all driver fatalities. An exception is Friday, which accounts for 21.5% of nonalcohol-related fatalities.

TABLE D.6

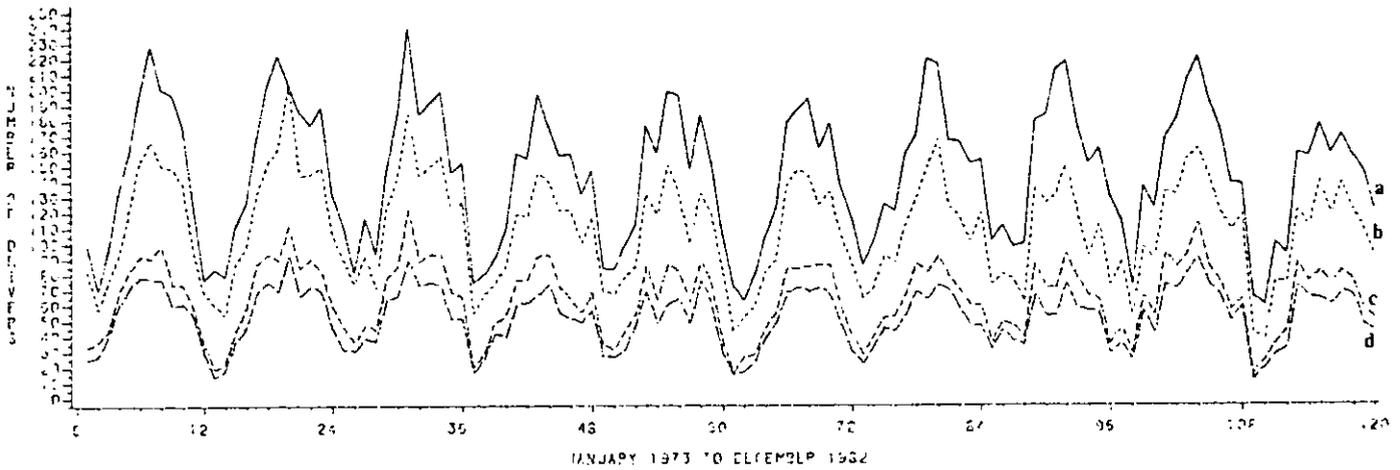
**Distribution of Driver Fatalities by
Day of Week and Blood Alcohol Concentration, 1981**

<u>Day of Week</u>	<u>Blood Alcohol Concentration</u>		
	<u>0</u>	<u>1-80</u>	<u>over 80</u>
Monday	14.9%	7.8%	6.4%
Tuesday	10.4%	10.4%	6.4%
Wednesday	12.8%	3.9%	10.4%
Thursday	13.1%	11.7%	13.2%
Friday	21.5%	20.8%	17.5%
Saturday	14.3%	22.1%	24.8%
Sunday	<u>12.8%</u>	<u>23.4%</u>	<u>21.3%</u>
	99.8	100.1	100.0

Source: Traffic Injury Research Foundation of Canada, 1983

Driver fatalities, as well as alcohol-related driver fatalities, show a very regular and consistent seasonal trend. The monthly fatalities (and alcohol-related fatalities) over the years 1973 to 1982 are presented in Figure D.1. Fatalities peak during the summer months and are at their lowest level during the winter months.

FIGURE D.1
DRIVER FATALITIES BY MONTH AND YEAR
(SEVEN PROVINCES, 1973 TO 1982)



a - DRIVERS
 b - DRIVERS TESTED FOR BAC
 c - DRIVERS WITH POSITIVE BAC
 d - DRIVERS WITH BAC OVER LEGAL LIMIT

D.5.2 Crash type. Table D.7 presents the distribution of BAC among fatally injured drivers according to whether the crash involved either a single vehicle (SVA) or multiple vehicles (MVA). Over the ten-year period, multiple vehicle accidents have accounted for about 55% of driver fatalities. Alcohol is more likely to be involved, and at greater levels, in single vehicle fatalities. One explanation is that in multiple vehicle accidents, some drivers do not suffer fatal injuries and are not tested for alcohol. We expect that a higher percentage of multiple vehicle accidents actually do involve alcohol than indicated here.

TABLE D.7

**Distribution of BAC by Accident Type
(Seven Canadian Provinces, 1973-1982)**

	<u>Zero</u>	<u>1-49</u>	<u>50-80</u>	<u>81-150</u>	<u>>150</u>	<u>Total</u>
MVA	4022	545	318	814	1639	7338
(%)	(54.8)	(7.4)	(4.3)	(11.1)	(22.3)	(100)
SVA	1427	285	313	1138	2640	5803
(%)	(24.6)	(4.9)	(5.4)	(19.6)	(45.5)	(100)

Source: Traffic Injury Research Foundation of Canada, 1984

D.6 Summary

Research indicates that about 40% of drivers killed in traffic accidents are sober, about 10% have low BACs, and 50% are above the legal limit. With respect to age, the 16-25 year old age group represents the largest proportion of driver fatalities irrespective of blood alcohol concentration. At negative BACs this group and the over 55 year old group represent the largest proportions. At concentrations under the legal limit, the 16-25 year old drivers represent more than half of the fatalities. For drivers who have BACs over the legal limit, the 26-35 year olds have the largest proportion of fatalities.

Males represent the largest proportion of drivers killed in motor vehicle accidents irrespective of BAC. The higher the blood alcohol concentration found in driver fatalities, the greater the likelihood of male involvement. Female representation in driver fatalities is highest in accidents where alcohol is not involved (approximately 35%). This decreases somewhat at blood alcohol concentrations below 80 mg%, with roughly 20% of females fatalities in this range. Males predominate among legally impaired driver fatalities, representing close to 90%.

Available data on the marital status of fatally-injured drivers suggests that married drivers represent the largest share, single drivers a close second, and separated, widowed or divorced automobile operators taking a relatively small share. There is some evidence to suggest that this latter group is more likely to have a higher BAC at the time of the accident.

The available literature indicates that the occupation of these drivers is predominately blue collar. Data on fatally injured drivers with a BAC in excess of 80 mg% suggest that well-established, white collar workers contribute a greater proportion of the fatalities. However, this observation is based on a study with a very small sample size.

In terms of previous violation record, fatally injured drivers have had little involvement with legal sanctions. Additionally, involvement tends to decrease with increasing seriousness of the violation. For legally impaired, fatally injured drivers there is some evidence to suggest a greater number of previous violations.

Fatally injured drivers have the greatest proportion of their accidents between 1 and 2 a.m. followed by those which occur around 11 p.m. There is a tendency for the number of driver fatalities to be low in the morning, rising in the evening, and high in the early morning. The youngest age group has the highest proportion of late night fatalities, the 20-49 year olds have more during the day, particularly around rush hour, and the older age groups were involved in fatal accidents during the day, at times other than rush hour. For drivers who are killed with

no alcohol involvement, the bulk of the accidents occur in roughly equal proportions in both morning and afternoon. At BACs below the legal limit there is a shift towards late evening, early morning driver fatalities, which is even more pronounced for those who are over the 80 mg% limit. Concerning day of week, the literature consistently reports that the largest proportion of driver fatalities occur on a Saturday, followed by Sunday, with the numbers gradually increasing from Monday to Friday. Driver fatalities, regardless of BAC, reveal a highly regular seasonal trend with the greatest number of accidents occurring during summer months.

Multiple vehicle accidents claim slightly more victims than single vehicle accidents; however, when alcohol is involved, single vehicle accidents predominate. Alcohol is more likely to be involved at higher levels among drivers fatally injured in single vehicle accidents.