ALCOHOL IN CASUALTIES AND CRIME:

THE CURRENT STATE OF RESEARCH AND FUTURE DIRECTIONS

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Alcohol's role in accidents has long been a matter of popular knowledge and literary comment, and alcohol's role in crime has been a substantial social concern since the heyday of the temperance movement in the nineteenth century. Reflecting historical shifts in social concerns, over the years substantial literatures of epidemiological studies have grown up concerned with alcohol's role in one or another casualty or crime. My present purpose is to outline some perspectives, findings and recommendations from a study of the existing data on alcohol's role in casualties and crime we undertook for the United States National Institute on Alcohol Abuse and Alcoholism.

From the beginning of the study, in the summer of 1976, we attempted to hold in an uneasy balance two competing perspectives concerning the study's material. On the one hand, we were interested in collecting and collating the available epidemiological data on alcohol in casualties and crime, and in making what sense we could of that data in terms of the nature and contingencies of alcohol's role. On the other hand, we were aware that our study existed in a context of expert and popular beliefs about alcohol as a cause of casualties and crime, and that these beliefs influenced not only what events were studied and with what methods, but also the nature of the events themselves: if alcohol is believed to be a "disinhibitor," this belief can influence behavior and resultant events. We had a keen interest, then, not only in epidemiological data but also in research that would give us some perspective on the cultural components of that data -- including laboratory and experimental studies, on the one hand, and cross-cultural and historical studies, on the other.

Considerable attention was devoted to developing a common frame of reference for interpreting the very disparate relevant literatures. The commonality which united the various problems and literatures with which we were concerned was seen to be the occurrence of serious events -- events which actually or potentially resulted in loss of life, injury, or substantial property loss. Conventionally such events are divided into two classes -- accidents and crimes -- according to whether the event is seen as resulting from someone's intention. In practice this distinction often breaks down: suicide is by definition intentional, but nowadays not criminal; an accident often involves at least the willingness to risk putting oneself at hazard; a homicide is often an inadvertent result of some other intention. But the distinction nevertheless profoundly affects the social handling of the event, and likewise affects the nature of the studies of the event. Studies concerned with alcohol's role in the event are particularly affected, since alcohol is commonly seen as potentially affecting intentions and indeed the capacity to have them.

To focus on events rather than conditions runs somewhat against the tides which have dominated the alcohol literature in the last 35 years, particularly in North America. The focus in that literature on alcoholism as a chronic disease has turned attention toward long-term processes, and away from what are often viewed as mere incidents. Where serious events have been covered in the alcoholism literature, they have often been seen simply as symptoms of some underlying condition. In our study, while we were interested in the cumulation and patterning of events in the individual's life-course, our main emphasis was on events as an important focus of study in their own right.

A study of alcohol's role in casualties and crime must face the issue of the meaning of causation. In the literature of the temperance era, attribution of causation of serious events to alcohol was not seen as problematic: if alcohol was present in the event, it took precedence as the cause of the event.

Traces of such thinking are widespread today, for instance in legal provisions in some places that a driver who is drunk is automatically the responsible party in an accident. But the current epidemiological literature takes a more ambiguous position on causation. The choice of variables and design for study often imply causal hypotheses, and the findings are often represented second- or third-hand in terms of cause, but the original research reports usually avoid directly causal language, choosing such ambiguous locutions as "related to." The question of cause and its possible meanings is thus not explicitly faced in the research analysis.

The lack of definition on issues of cause leaves a wide field open for interpretation of the empirical associations reported in the literature. In the U.S. at present, the dominant tendency in public discourse is toward what we termed "problem enhancement" -- the tendency to use the largest available figures on the association of alcohol and a list of casualties and crimes as a way of drawing public attention to alcohol problems and justifying increased budgets for treatment and prevention. But the ambiguity also allows for the opposite tendency -- with some justice, temperance writers of the 1940's complained of "problem minimization" by the early alcoholism movement researchers, who tended systematically to downplay negative and disreputable effects of drinking.

Whatever the interpretation placed on it, the literature on alcohol, casualties and crime has been primarily oriented around measuring the association of some aspect of alcohol with particular kinds of serious events. In principle, if the aspect of alcohol and the serious event are both treated as dichotomies, measuring their association requires filling in all the cells of a four-way table.

Serious event

Alcohol aspect present:		No	Yes
	No	a	b
	Yes	d	c

A variety of aspects of alcohol can be used as measures in such a study: blood-alcohol concentration, a diagnosis of alcoholism, quantity-frequency of drinking, an official notation that the person "had been drinking," etc. From the point of views of study design these aspects separate into two general classes: measurements of alcohol in the event, whether a person was drunk or had been drinking at a particular time, place and circumstance; and measurements of drinking history or status, what a person's general drinking patterns or problems are or have been. Of course, these two classes of measures hold quite different implications for the meaning of the study. They also point toward different population frames to sample in making the study: while for studies of drinking history or status, a population of persons is appropriate, for studies of alcohol in the event the appropriate frame is a population of events or of persons-in-events.

In practice, most studies of alcohol and casualties or crime do not directly measure the full four cells sketched above. Serious events are relatively rare, and it is expensive and time-consuming to carry out a study which waits for them to occur or otherwise measures in the same frame their occurrence or non-occurrence. To a lesser extent, the same is true for drunkenness or alcoholism: most of us spend most of our time sober, and relatively small proportions of the population ever acquire a clinical

diagnosis of alcoholism. Many studies thus measure only two of the four cells: either they are event-based studies (cells b and c), measuring the presence or absence of an alcohol aspect in a population of serious events, or they are studies of populations of alcoholics or problem drinkers (cells c and d), measuring the occurrence or non-occurrence of serious events in such populations. We found in the literature, then, three general types of studies:

Type I studies: studies of populations of serious events, measuring the presence or absence of alcohol in the event.

Type II studies: studies of populations of serious events, measuring the drinking history or status of persons involved in the event.

Type III studies: studies of populations of alcoholics or heavy or problem drinkers, measuring the occurrence of serious events over some time period in the population.

In our study we attempted to make a comprehensive collection of the available epidemiological literature, classified according to these three types of study. For the traffic literature, which was the most extensive, we limited ourselves to North American studies, but for other casualties and crime we also used studies available to us from other areas of the world. The three charts which accompany this paper show a summary of what we found, in terms of the overall range of findings for each type of casualty or crime represented in the literature.

It is first worth noting that there are very wide disparities in the extent to which different casualties and crimes have been studied. To a considerable extent, this reflects the different historical developments of concern and the different professions and institutions involved in the various casualties and crimes. It will help give some perspective on the findings in the charts to give a brief sketch of the major research traditions whose findings they reflect.

The empirical literature on alcohol and crime has the longest tradition. Alcohol's role in crime was of obvious interest to the temperance movement, since an emphasis on the connection fitted the temperance image of alcohol as a source of evil and destruction. The alcohol and crime connection also formed an important part of the temperance movement argument about the costs to government of the liquor trade, since the growth of the ideology of coercive institutionalized reform in the same period had made prisons and other houses of correction a significant tax burden. The collection of empirical data about alcohol's role in crime thus became a temperance activity quite early in the movement's history. Eventually, under the impetus of the temperance agenda, substantial and less partisan scholarly work got under way about the turn of the century, particularly in Germany and the U.S.

Although cultural perceptions of alcohol's role in accidents predated the temperance-era emphasis on alcohol's role in crime, the empirical literatures on alcohol and accidents are much more recent. While the nineteenth century was concerned about accident prevention, as evidenced by the invention and promotion of such articles as safety matches, safety pins and safety catches, safety was seen as a matter for individual concern and care, and not as a collective concern or political matter. Except for some interest in the late nineteenth century in alcohol's role in train wrecks, the classic temperance movement thus did not emphasize alcohol's role in accidents. Only in the Progressive era, around the beginning of the twentieth century, did safety concerns become an organized movement. In large part, at least in the U.S., these concerns were a response by employers and their insurers to new obligations imposed on them to compensate their workers for industrial injuries. The early empirical studies on alcohol and accidents are thus mostly concerned with industrial accidents.

The literature on alcohol and casualties which now bulks largest, that on traffic safety and accidents, is of relatively recent vintage. Although there were a few earlier careful empirical studies, an organized and burgeoning literature in the field was a phenomenon of the 1950's and 1960's. The scope of this recent research effort is a faithful reflection of popular concerns in the U.S., at least, with traffic casualties as the most serious alcohol-related problem.

Currier's 1848 print of "The Drunkard's Progress" portraying "death by suicide" as the final step on the downward path, reflects an association of drinking and suicide in temperance thought. Durkheim's landmark study of Suicide in the late nineteenth century includes a discussion of the relation of alcohol and suicide although by "alcohol" consumption Durkheim was referring to spirits but not wine drinking. A systematic literature only got under way, however, in the psychoanalytic literature between the world wars, and epidemiological studies of alcohol's role in suicide were rare before the development of a special interest in "suicidology" in the 1950's and 1960's. The literature tends to have retained a psychiatric orientation.

Following the development in the 1930's of convenient methods of testing for the alcohol content of body fluids, recent decades have also seen a growing literature on alcohol's role in fatalities, and sometimes in injuries, across the whole range of types of casualty -- industrial, "home," fire and burns, drowning, falls, aviation, traffic, assault and homicide, suicide, etc. Recent years have also seen special studies of alcohol's role in a wide variety of specialized casualty situations -- food asphyxiation (choking), frostbite, snowmobile injuries, tractor injuries, etc.

Charts I, II, and III, which show respectively the ranges of findings for the three major types of studies for various classes of serious events, are in general based on serious empirical studies performed in industrialized

countries, with special emphasis on U.S. studies. Charts I and II generally use whatever alcohol indicator was featured in the original study; in many cases this was any evidence of alcohol in the situation. Because of the vastness and greater sophistication of the traffic literature, traffic accident studies in all three charts are confined to U.S. studies. In Chart I, for traffic studies only, a BAC of .10 or above is used wherever possible as the criterion for alcohol involvement.

The charts are in general arranged under the five major headings into which we organized our study, with a series of subheadings. Because of their very different incidences, studies of fatalities and non-fatalities are separated; in some cases non-fatality studies include a small proportion of fatalities. For crime, a distinction is made between the "offender" and the "victim"; in traffic accidents, the distinction between "responsible" and "non-responsible" is more or less functionally equivalent, although without the same degree of moral opprobrium. Family abuse studies in the table are all of "offenders." In accidents generally, everyone is assumed to be a victim; in suicide, of course, the offender and victim are one and the same.

It is worth first paying some attention to the number of studies of the various types for the different kinds of serious events, although because of duplication and selection of criteria the numbers shown are only rough guides, and seriously underestimate the size of the traffic literature.

Type II studies are the most numerous for child abuse, child molesting, prison population, and suicide studies. For suicide completers, all three types of studies are well represented. For the other areas -- arrest studies, marital violence, and studies of all types of accidents -- Type I studies are the most numerous. In general, this distribution of study types may be seen as reflecting assumptions about the issue of intentionality; for putatively unintended events, a contextual approach seems most relevant, while when

intention is involved characteristics of the person's history became salient.

There is a very wide disparity in the number of studies devoted to each class of event. Overall, the family abuse area has the fewest empirical studies of alcohol involvement. While all other general classes of events have a substantial number of studies, the studies are differentially distributed among specific events, and in every accident area except industrial accidents studies of fatalities are more numerous than studies of injuries. Within the field of study of serious events, that is, the emphasis is on the rarest and most extreme kinds of events.

Turning to the ranges of reported alcohol involvement in Charts I and II, the overall impression is of the tremendous range of results reported. In general, the larger number of studies in an area, the wider the range of results. The restrictions of location and alcohol measure for traffic accidents in Chart I seems to result in somewhat smaller ranges in categories with a larger number of studies, but the variation remains quite large. The main effect of the restriction seems to be in raising the lower limit of the range.

The lowest upper limit of findings for any category in Chart I is 25% for the 3 studies of drivers involved in non-fatal accidents -- probably the most common class of serious events in the table. Only four of the 32 categories in the chart shows upper limits below 40%, and 8 below 50%. A writer seeking to state the maximum case for alcohol's role in serious events and impact on society can thus find ample grist for the mill in the epidemiological literature. On the other hand, a writer with the less common agenda of minimizing the role of alcohol can find figures below 20% for all except five categories: drivers in fatal and single-car fatal accidents, pedestrians in fatal accidents, and homicides and assault offenders.

The few categories in Chart II which have substantial numbers of studies show especially large variations in findings, partly reflecting the wide diversity of drinking history measures used in this type of study. But only in the cases of family abuse and suicide completers does the highest percentage in a category exceed the highest percentage for that category in Chart I.

Chart III again reveals a wide disparity between studies in the casualty and crime experience of samples of alcoholics. A comparison of Charts III A and III B underlines the fact that, even in such special samples, fatal events are a small subclass of serious events. The general picture is of a population at relatively high risk of serious events.

As we have noted, the results shown in Charts I, II, and III reflect the measurement of only two of the cells of the fourfold table we sketched before. This type of study is the prime source of the single-number estimates of the proportion of crimes or accidents "due to alcohol" which so often play a prominent role in statements of the magnitude of alcohol problems. Of course, such a study does not establish a causal relationship; without filling out the fourfold table, it does not even establish an association between alcohol and serious events.

There have been three main ways of filling out the fourfold table. One is by assumption. And indeed there is something to be said for accepting the obvious: where alcohol is involved in a high proportion of events, it may seem superfluous to check on the distribution of alcohol when no serious event occurs. But as a society becomes "wetter," so that alcohol becomes more omnipresent, what seems obvious may become misleading: most or all of the alcohol involvement may be there in the absence of serious events.

A second way to fill out the fourfold table is by a study of the full population of all four cells. As we have discussed, this is expensive, but has occasionally been undertaken for samples of persons (Types II and III studies). Such designs are particularly appropriate for studies of events which are serious but not fatal -- injury rather than mortality, suicide attempt rather than completion, assault rather than murder. Such events are up to 100 times more common that the fatal events on which the literature has lavished the most attention. And such studies have the considerable added advantage of allowing for multivariate analysis, where the alcohol association can be compared with and controlled by associations with other factors.

For a Type I analysis, where what would be required would be a sample of situations or occurrences (of of persons-in-situations), the methodology of such a study has not been as well worked out, and the data collection costs seem formidable. The closest approach has been the roadside breath-testing surveys in recent years, which sometimes attempt to sample all driving circumstances.

The third way of filling out the table is with a control sample or population. In epidemiological terms this means a retrospective rather than a prospective design, and the epidemiological literature offers ample discussion of the pitfalls of this method. Nevertheless, the case-control and other control-population designs continue to be necessary tools in the study of rare conditions and events.

Controlled studies are especially crucial in alcohol research becasue drinking patterns in our society are quite highly specific -- males drink more than females, younger adults drink more on an occasion than older adults, styles of drinking vary by social class and ethnoreligious group. Drinking is predominantly a leisure-time activity in the United States, and a frequent

accompaniment to specific activities, such as partying, watching football on television, or boating. Drinking, and particularly heavy drinking, is more common in the evening than in the morning, more common on Friday and Saturday eventing than at other times. Heavy drinkers and heavy drinking situations vary from others also on many non-drinking characteristics. Most importantly, norms of behavior while drinking vary considerably between different social groups and situations: an equal amount of alcohol may make people in one situation quiet and in another reckless.

Different kinds of serious events also occur in quite specific circumstances and to different classes of people. For example, overall, accidents are predominantly a male phenomenon. Patterns by age vary by class of accident. Drownings are more frequent in summer, fires in winter. Occupational accidents as conventionally defined can happed only to those who are employed. These and many other factors may covary and contrast with patterns and locations of drinking.

The relevant control design is somewhat different for each of the three major types of study. In studies of alcohol in the event, the control sample is a smaple of people in equivalent situations where an event has not occurred. This type of study is most highly developed in the traffic field, but the method has also been applied to such circumstances as pedestrian falls in public places. Typically, such studies control for physical and temporal characteristics of the event -- time of day, weather conditions, etc. -- and sometimes for personal characteristics -- age, etc. At a time and place determined by such controls, a person is stopped and tested for alcohol in the body, and this sample of person-in-situations fills out the remaining two cells of the fourfold table.

There is room for doubt whether such a method controls for all factors other than drinking which might contribute to the event, so that it cannot

be assumed that the difference between the proportions of alcohol involvement in the event-group and the control-group represents the effects of alcohol. On the other hand, tightening the net of controls more tightly around a serious event situation can reduce the method in the end to absurdity: the researcher may end up looking for matched controls in a particular neighborhood who are on a rickety ladder in a high wind, that is, in a situation in which no sober person in his right mind would find himself.

In studies of the drinking history and drinking problems of persons in the serious event (Type II), there is considerable opportunity to find control data in existing general population samples. Of course, this type of controlled study, while giving a general indication of the strength of relationship of alcohol measures and serious events in persons, gives little indication of the nature of the role alcohol may play in the events. Nevertheless, in future studies of samples of events, it would seem worthwhile to enquire about general drinking habits and problems as well as alcohol in the event, if only to allow a comparison in comparable form with general population data on drinking habits and problems.

The control population has perhaps been most widely used in Type III studies, analyzing the involvement in serious events of samples of labelled alcoholics. It is primarily mortality that has been subjected to such comparisons, because of the ready availability of mortality statistics for the population in general. These comparisons are generally reported in the form of a relative risk statistic, showing how much more likely a member of the alcoholic sample is to die of the specified cause than a member of the general population. Normally such comparisons are controlled or standardized by age and sex. In interpreting such comparisons, it should be borne in mind that a high relative risk may not indicate a substantial absolute level of risk; that the clinical population is unlikely to be evenly drawn, geographically

or otherwise, from the comparison population; and that the alcoholic population typically differs from the general population in many ways other than in drinking habits, age, and sex. In interpreting studies of alcoholics it cannot be assumed that a high rate of crime or greater risk of accident or suicide is due to alcohol use.

Controlled studies have primarily been done for accidents rather than crime or suicide. This partly reflects the different trainings of workers in the different fields: the controlled study is an epidemiological rather than criminological stock-in-trade. Control comparisons are certainly a logical extension of Type II and Type III studies of alcohol and crime. However, the concept of a controlled study seems to break down for Type I studies of events such as suicide and crime where intention enters in. It does not seem to make much sense to measure the alcohol of a customer in the store at the same time and place that a holdup occurred on a previous day, or of a pedestrian on a bridge where a suicide occurred. Where intention is explicitly a part of our definition of the situation, we assume that alcohol affects intentions, and the choice of the context for the event is in turn affected by intentions. Of course, these assumptions are not necessarily true: many crimes are crimes of opportunity in a chance situation. But the seeming incongruity of a case-control study of alcohol in the criminal event should sensitize us to potential problems in the use of such studies for accidents, since in these situations too intentions and a voluntary choice of the context of behavior are potentially involved.

Our discussion so far has been predicated on the assumption that the main aim of a study of alcohol's role in casualties and crime is to fill out the fourfold table -- to establish the extra risk of serious events associated with alcohol in one of its aspects. Such studies are indeed useful and will

no doubt continue, but in my view it is time to turn also to some new directions of study. To establish what percentage of some casualty is associated with drinking, even with other factors in the situation controlled, may serve an important purpose of directing public attention at the scope and nature of alcohol problems, but it does not give much guidance on what to do about them. For this overriding purpose of preventing or reducing alcohol-related casualties and crime, much of the existing literature is essentially useless. In our report on our study, we made a number of suggestions concerning the organization of and future directions for research. I will limit myself here to two suggested directions for new studies.

New General-Population Studies: General-population studies of drinking practices and problems have up till the present not emphasized the area of alcohol and serious events, although items in the area have often been included in general drinking problems scores. But our review and reanalyses of existing data suggest some puzzles which general-population data can help address. (a) Quite generally, alcohol appears to be particularly involved in the most serious events. For minimal-level casualties, the association with drinking is often quite slight. (b) Alcohol seems to show a stronger relation to casualties in studies of samples of events than in studies of samples of people from the general population. These overall findings suggest directions for particular attention: (a) alcohol may contribute not so much to the occurrence of events as to determining how serious their outcome is; (b) particularly in middle age, heavy drinkers may be at less risk of casualties because of a sedentary lifestyle -- a barstool may be less hazardous than a ski slope; (c) alcohol may be more implicated in events than in people, i.e., subsections of the population differentiated in other ways as well as in drinking may cumulate series of events. These areas for attention cannot be addressed only with general-poulation data, but general-population data can

test the findings suggested by reviews and reanalyses, can be used for a multivariate analyses of drinking and serious events controlling for lifestyle and other risk factors, and can begin to address the important question of how people avoid serious events while drinking. The sample needs to be quite large, and a new kind of questionnaire with detailed retrospective coverage of events and their conditions and sequelae needs to be developed. Provision should be made for a possible prospective follow-up design.

New Studies of Serious Events: We have been surprised by the lack of studies of serious events which pay detailed attention to alcohol's place in the scenario of the event. Most data sets of samples of serious events contain only one alcohol measure, few other relevant potential conditions in the event, no information on the timing or sequencing of occurrences, and little information on characteristics of the event. The model of the multi-disciplinary accident investigation team used for aircraft crashes and to a limited extent in highway crashes does not appear to have been used for studies of alcohol's role in events.

Systematic studies of the scenarios of events -- of the sequence of occurrences, of the factors involved and of when they played their part -- will provide a base for knowledge from which preventive strategies can be identified and applied. In addition to the scenario of the event sampled, the histories of involvement of participants in the event in previous events should be ascertained, to allow a study of the cumulation of serious events in the history of particular individuals.

Future research on alcohol's role in casualties and crime needs to accept the responsibility of connecting its study design and analysis to potential preventive actions. The preventive strategies involved may often involve attempts to influence drinking patterns and behavior while drinking -- by pointing out hidden dangers, by changing social norms on drinking, by

deterring problematic behaviors, etc. But, as experience in the traffic safety literature suggests, human behavior may often be more difficult to change than the environment in which it occurs. Studies of serious events need to pay detailed attention to characteristics of the social and physical environment of the event, from the point of view of potential mechanisms for intervention. In societies where drinking is as widely accepted as ours, we must seriously undertake the aim of making the world safer for drunkenness. Whether this will result in more drunkenness is an interesting empirical question, but hardly a justification for tolerating continued deaths and injuries.

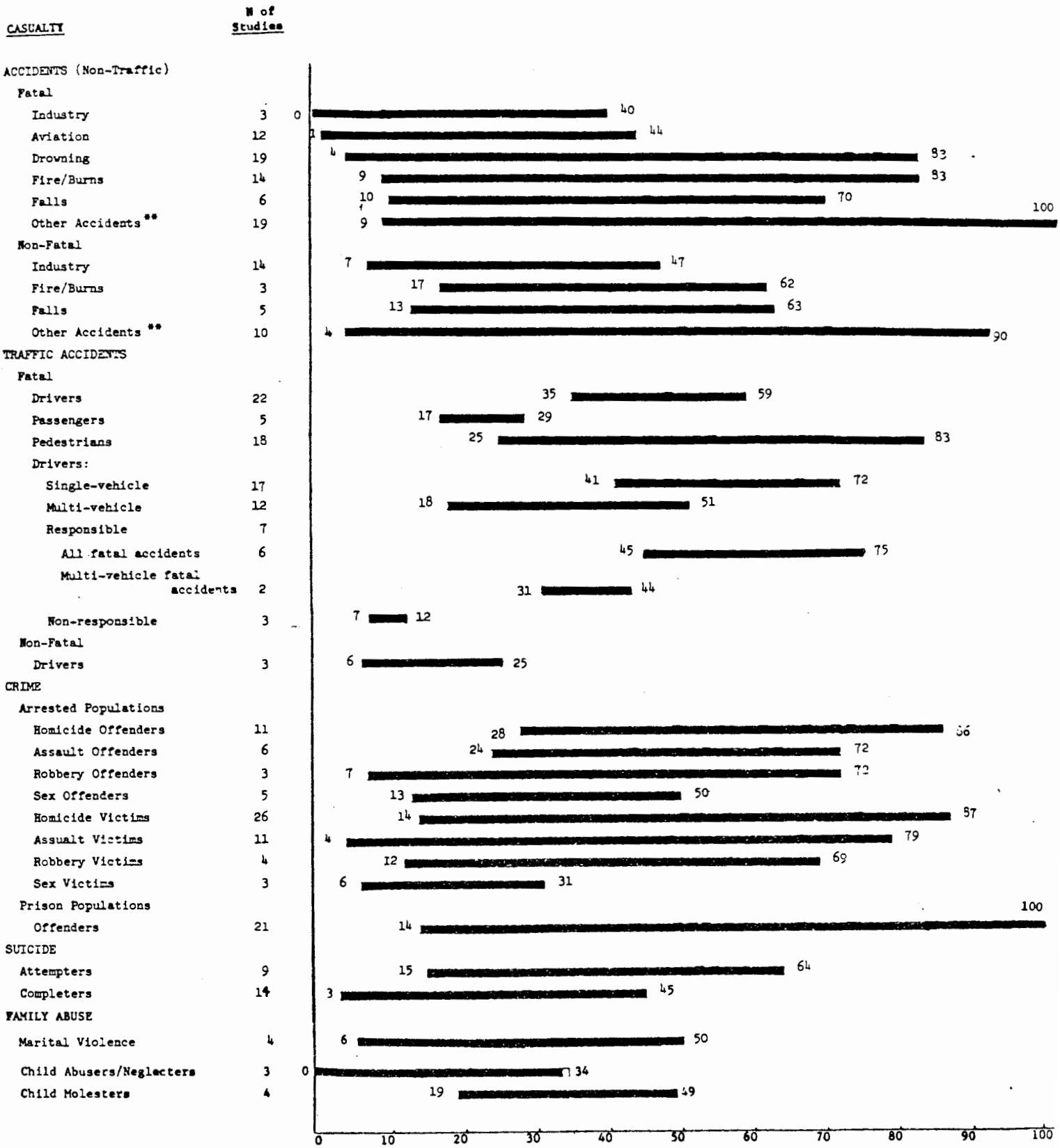

CHART I: SUMMARY OF STUDIES REPORTING ALCOHOL INVOLVEMENT*

AT THE TIME OF THE CASUALTY (IN PERCENT)

* Studies use measures such as BACs, police reports of drinking, witness reports, self-reports.
** Includes for example poisoning, food asphyxiation deaths (choking), frost injuries and deaths.

CASUALTY	N of Studies
ACCIDENTS (Non-Traffic)	
Fatal	
Fire/Burns	2
Falls	1
Other **	2
Non-Fatal	
Fire/Burns	1
TRAFFIC	
Accidents	8
DWIs	9
CRIME	
Arrested Populations	
Homicide Victims	1
Prison Populations	
Offenders	27
SUICIDE	
Attempters	20
Completers	19
FAMILY ABUSE	
Marital Violence	1
Child Abusers/Neglecters	7
Child Molesters	11

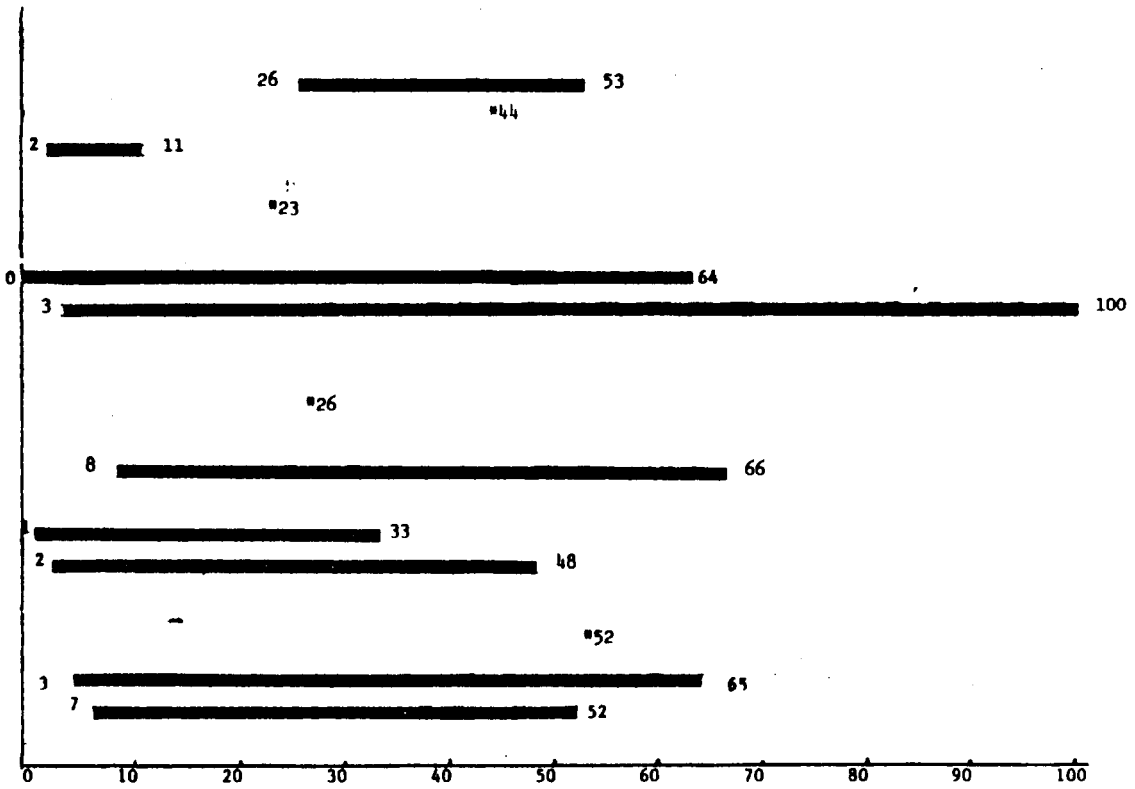

CHART II: SUMMARY OF STUDIES REPORTING DRINKING HISTORY*
OF PERSONS IN CASUALTY (IN PERCENT)

* Includes alcoholics, problem drinkers and high quantity/frequency users of alcohol
** Includes for example poisoning, food asphyxiation deaths (choking), frost injuries and deaths.

CASUALTY	N of Studies
ACCIDENTS (Non-Traffic)	--
TRAFFIC	
Accidents	2
DWI Offenses	7
CRIME OFFENSES	9
SUICIDE ATTEMPTS	9
FAMILY ABUSE	--

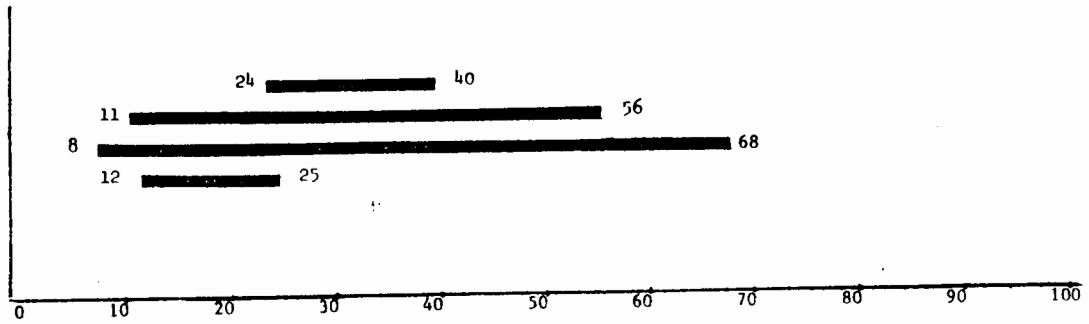

CHART IIIA: SUMMARY OF STUDIES REPORTING THE NON-FATAL CASUALTY INVOLVEMENT OF LABELLED ALCOHOLICS (IN PERCENT)

CASUALTY	N of Studies
ACCIDENTS (Non-Traffic)	
Drowning	3
Fire/Burns	3
Falls	4
Other Accidents *	8
TRAFFIC ACCIDENTS	6
CRIME	
Homicide Offense	4
Homicide Victim	2
SUICIDES	20
FAMILY ABUSE	--

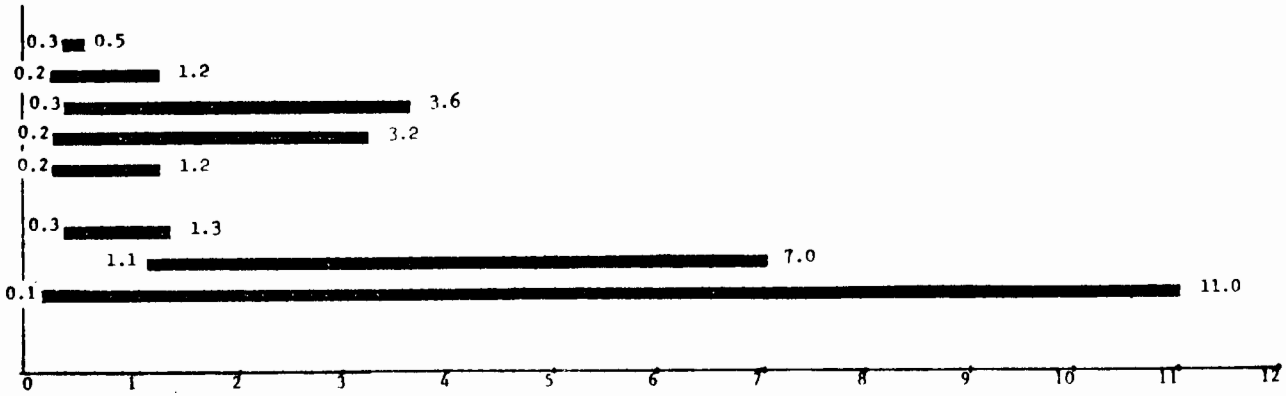

CHART IIIB: SUMMARY OF STUDIES REPORTING THE FATAL CASUALTY INVOLVEMENT OF LABELLED ALCOHOLICS (IN PERCENT)

* Includes, for example, poisoning, food asphyxiation deaths (choking), frost injuries and deaths.

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