Statement for the Epidemiological Approach

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Dr. Perrine has provided an excellent illustration of how experimental and epidemiological based findings can be linked and, more importantly, why they should be linked. Indeed, progress in our field will continue to depend upon the synergy of experimental and epidemiological research, since it is the convergence of findings from these two complementary approaches that has provided us with our most solid facts. Indeed, it is now widely accepted that a complete understanding of the problem of drinking and driving will be achieved only in the presence of findings from these two approaches.

Since I have been asked to speak for the epidemiological approach, in the few minutes available to me I would like to emphasize that most of the epidemiological research being conducted around the world today is a far cry from the elegant program discussed by Dr. Perrine. Indeed, his program is not at all representative of the rather basic work that still characterizes the vast majority of studies in the area. Thus, I would like to circumscribe the reality of most epidemiological research in this field and remind us of the distance we have to go. While it is quite evident that significant strides have been made in epidemiological research in the past several decades, I believe we need to be reminded of the challenges we still face.

Descriptive Epidemiology

Descriptive epidemiology seeks to define the magnitude and characteristics of the problem, primarily to assist in priority setting and to guide analytic epidemiology.

It is a sad fact that most epidemiological research does not rely on primary data -- data generated under rigorous control by the researcher, exclusively to answer questions posed by the researcher. Rather, most epidemiological research still relies on secondary data -- such as police reports or coroners reports -- with all their problems and attendant limitations. The most complete and reliable secondary data are available on persons who die, so it is no coincidence that the literature is dominated by studies of fatalities. Many countries now have reasonably reliable data bases that contain information on persons killed in road crashes and these are routinely exploited.

However, I should hasten to add that it is still the case that many of the countries represented here today do not even have reliable information on persons killed in road crashes. For them I am certain that programs such as Dr. Perrine's seems like a fantasy.
They are still trying to answer the most basic of questions such as “what percent of fatally drivers have been drinking?”

But even in countries with reliable data bases on persons killed in road crashes, serious gaps still exist. For example, in many countries while we know something about those who die, little is known about those who survive -- that includes those involved in a fatal crash (surviving drivers) and those involved only in injury crashes. And, of course, the quality of information available on alcohol involvement in property damage crashes is scarce indeed.

This is not lamentable just because we want data for the sake of data. It is essential for judging the effectiveness of countermeasure efforts. To illustrate, it might well be the case that a program or policy is rejected because it is not shown to impact the number of persons killed -- however, it might well have affected less severe crashes. In the absence of the needed data, however, we will never know. Clearly, most countries have a significant distance to go even in the area of descriptive epidemiology.

**Analytic Epidemiology**

Analytic epidemiology seeks to identify high risk groups and/or conditions. The principle tool of analytic epidemiology has been the risk factors approach, pioneered in its application in studies such as the Grand Rapids investigation by Bob Borkenstein and his colleagues. That study gave us the well known relationship between BAC and the risk of collision -- increases in BAC were associated with increases in risk -- and this relationship showed a marked acceleration around 80 to 100 mg%.

The robust nature of this relationship has been demonstrated by replications around the world. Some of these have helped refine our understanding of this aggregate risk curve. It has been shown that the shape of the curve varies dramatically as a function of such variables as drinking experience and age. For example, my colleague Dan Mayhew, showed that the risk of collision for drinking drivers varied as a function of age. Most notably, young drivers were shown to be at higher risk than other age groups, at all alcohol levels.

But our use of this analytic tool has been slowed by the cost and complexity of obtaining information from the control group -- the population at risk -- indeed these data are becoming increasingly difficult to obtain in many countries. This means that the area remains ripe for international cooperation and vital to our understanding of the factors associated with collision involvement.

At the same time, analytic epidemiology is turning to a different tool to obtain insights into the etiology of the problem of drinking and driving. This tool is the longitudinal cohort study, so common in the health field and developmental psychology but only
recently popularized in traffic safety. These studies track the behaviour of the same individuals over many years as a means of identifying significant antecedent (causal) variables and the transitions in them. A pioneering study in this area by my colleague Doug Beirness and I has demonstrated the powerful role of lifestyle variables in determining the crash involvement of young drivers. Such research can provide valuable insights into the etiology of road crashes, particularly into the role of more distal factors such as psychosocial variables. This is an area in need of continued work.

In summary, there is a continuing need for basic, quality epidemiological research to provide answers to even the most fundamental questions in our area and a need for innovative analytic approaches to provide insights into the factors that render drinking drivers at higher risk of collision.