James Beckett III, Bowling Green State University Wayne A. Woodward, Southern Methodist University

# INTRODUCTION AND SETTING

Because of the growing concern for the problem of alcohol-related traffic accidents, the Department of Transportation developed Alcohol Safety Action Programs (ASAP's) in selected communities across the United States. An ASAP project was implemented in Dallas, Texas in October 1972. A major goal of this particular program was to develop, investigate, and evaluate methods of educating the DWI (driving while intoxicated) driver. During the 27 month period from the inception of the study until December 1974, 6644 persons were arrested on first offense DWI charges and assigned to the program as a condition of their probation. These probationers were randomly assigned to the control group or to the "school" group, where the school group was composed of three specific models. Thus members of the school group were further apportioned to either the Traditional Model (TM), Counseling Model (CM), or the Parent Effectiveness Training (PET) Model.

The purpose of the Traditional Model was to provide information to the probationers concerning alcohol, its effects on the body, and its effects on driving. The Parent Effectiveness Training Model was designed to teach interpersonal communications skills in the areas of conflict resolution. It was felt that these skills would equip the person to deal with problems through means other than drinking. The Counseling Model was conceived relatively late in the program and was based on the idea that "problem drinkers" and "social drinkers" should be treated differently. Probationers were classified as either a social drinker or a problem drinker on the basis of the Mortimer-Filkins Alcohol Abuse Inventory. Social drinkers were then assigned to classes identical to the TM classes. The problem drinkers attended sessions in which dyadic interaction between probationers along with brief direction from instructors was employed to help each problem drinker identify his specific alcohol-related problem.

## STATISTICAL ANALYSIS OF MODEL PERFORMANCE

The objective of the previously described models was to eliminate (or reduce) the drinking/driving behavior of the probationers. The effectiveness of each model was measured by the rearrest rate of its graduates. Thus the three models and the control group were compared by monitoring the DWI arrest data for the city of Dallas in order to obtain data concerning which probationers were arrested on a DWI charge after their training (or assignment to the control group), and for those who were rearrested, how long they had been out of school when they were rearrested.

Due to the magnitude of the study, a probationer was observed in this fashion only if he was

rearrested on a DWI charge in the city of Dallas. With this partial individual follow-up it was impossible to determine whether or not a probationer had been rearrested somewhere other than Dallas or even whether or not he still lived in Dallas. Those graduating from a school in the latter part of the study period (e.g., Counseling Model) were less exposed to the possibility of rearrest.

Biostatisticians handle a similar problem in medical research and epidemiological studies using the Actuarial or Life Table Method. For those unfamiliar with the method, Cutler and Ederer (1958) provide a well-written example of the procedure. In the medical setting measurement of patient survival is necessary for the evaluation of the treatment of usually fatal chronic diseases, e.g., cancer. The principal advantage of the Life Table Method (here) is that it makes possible the use of all survival (rearrest) information accumulated up to the closing date of the study. However, cancer patients are usually followed-up periodically until the end of the study. Our situation with partial and incomplete follow-up magnifies the usual problem of competing risks. The "partial and incomplete" followup stems from the fact that only those few who are rearrested are part of the follow-up; the many others not rearrested were never contacted in any way. If a person leaves the study (moves from Dallas or quits driving in Dallas), this information should be used in estimating the rearrest rate. In our case this outward migration was estimated (from outside sources) to be 10 percent per year which causes the rearrest rates to be adjusted slightly upward. Withdrawals from the study and losses due to followup (migration) were assumed uniformly distributed throughout each quarter.

Since the duration of the study was only nine periods (quarters), the effect of 10 percent annual migration versus, say 8 percent or 12 percent is not as pronounced as it would have been for a study with longer follow-up. The question of interest is which school is most effective; for this we need only detect significant differences in proportions. The slope of the rearrest rate curve (vs. time) was not considered; only the final estimated proportion since all the schools' objectives were felt to be more short term than long term.

### RESULTS AND REMARKS

This general method (Life Table Method) is by no means new and improvements, such as the Cox Model (Cox, 1974), are to be found in the statistical literature. The Cutler and Ederer version of the Life Table Method as mentioned here is simple to use (See Table 1), and studies have shown it to be quite acceptable. However it has been our experience that the awareness of the Life Table Method is not widespread in the social sciences where it might have impact on studies similar to that in which we participated. Our approaches in evaluating person-quarters exposed and estimating outward migration provided us with the following interpretable results after three quarters.

	Cumulative	Standard	Effective	
	Rearrest	Error of	Number Expose:	
	Rate	<u>Rearrest Rate</u>	to Rearrest	
CM	.0212	.0080	147	
TM	.0469	.0048	1733	
Control	.0400	.0054	1105	

Note that the Counseling Model was significantly the best as covered more fully in Gottlieb, Pascoe, Woodward, and Beckett (1975).

### ACKNOWLEDGEMENT

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Quarters after completion	Number at beginning of period	Number rearrested	Number migration	Number withdrawn	Effective number exposed	Cumulative proportion rearrested
0 - 1	1167	8	29	425	940	.0085
1 - 2	705	3	19	390	501	.0145

TABLE 1