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TITLE: A Confidence Interval Approach to the Development of Blood Alcohol Concentration Charts

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PROJECT OBJECTIVE:

To develop blood alcohol concentration charts based on confidence interval estimates.

SUMMARY:

This report points out that alcohol nomograms and charts based on population averages may induce substantial inaccuracies in the estimates of individuals' blood alcohol concentrations (BACs). Also, many such charts require a compensating equation to account for the metabolic elimination of alcohol over a period of time. Together, these two factors can potentially lead to unsafe under-estimates of BAC.

An approach was developed for estimating expected BAC, varying as a function of time and amount of alcohol consumed, which incorporated a one-tailed confidence interval based upon an experimentally-derived estimate of individual variation (standard deviation). An interactive FORTRAN program was written to generate a series of BAC charts. BAC estimates were computed using a version of the Widmark equation, modified to incorporate the confidence-interval computation. Insofar as they provide BAC estimates which are very unlikely to unsafely underestimate the actual BAC, the confidence-interval weight-specific BAC charts are superior to average-value BAC charts.

IMPLEMENTATION STATUS OF FINDINGS AND RECOMMENDATIONS:

At the time of writing, the California Department of Motor Vehicles, has distributed approximately four million copies of a half-page leaflet containing wallet-sized BAC charts generated using this method for eight weight ranges from 90 to 230 lbs., in increments of 20 lbs. These charts are also being used by a variety of other California agencies and permission has been granted for their use in several other states.

In addition the confidence-interval BAC charts (DL 606) are distributed with vehicle registration renewal notices and included in the California Driver Handbook.

SUPPLEMENTARY INFORMATION:

Published in *Abstracts and Reviews in Alcohol and Driving*, March, 1986, and *Journal of Safety Research*, 17(3),129-133.