
A discrete dynamical model to make decisions during alcohol consumption

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Consumption of alcohol not only damages one's health, but also is the source of many socio-economic issues. In the worst-case scenario, it could even lead to unfortunate occurrences such as traffic collisions, domestic violence, mental health corruption, etc. Therefore, without any doubt, alcohol consumption continues to be one of the major problems in our society which needs everyone's attention.

From a mathematical point of view, the dynamics of alcohol in the body is quite interesting. The amount of alcohol in a person's blood is known as "blood alcohol level or "blood alcohol content" (BAC). The BAC of an individual is determined by four major factors namely, body weight, gender, quantity of alcohol consumed, and time elapsed from first drink until a breath or blood sample is taken. By using the relationship between those factors, we have developed a dynamical system that predicts the BAC of a person at any given time. To develop this model, we used a reasonable new rational function for the fraction of the alcohol that is eliminated from the body. The values derived from the above model can be compared with the benchmarks and depending on the results, we can conclude the overall effect made by alcohol on individual consumers. For example, this model can be used by individual consumers to determine whether they are within the legal limit for Driving While Intoxicated (DWI) prior to start their drive. Finally, this study encourages people to make intelligent choices about alcohol consumption.

Keywords: Alcohol, Dynamics, BAC, DWI, Decision making, Mathematical modelling

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