

Prediction of Violence Risk Levels: Simulated Statistical Model

Abstract

Currently, mathematical models are being developed with different mathematical and statistical techniques, as well as supervised and unsupervised learning to predict the level of violence against women; however, most of these models do not take into account that to establish the level of risk of the victim the experts in the subject of violence in practice apply a violence risk questionnaire to the victim where from it they determine the level of violence.

In particular, there is a mathematical model reported in the literatura (see [1]) that takes this risk questionnaire as an initial condition parameter. Said model establishes predictive levels of risk of violence for the victim at one year in a cycle of violence. However, these risk levels that it establishes are only for a few simulations (violence scenarios), that is, it does not show statistical results taking into account more violence scenarios.

This paper presents the statistical implications of the mathematical model proposed by Leal-Enríquez E. et. al., as well as the segmentation by level of violence for each month within a cycle of violence that the victim could suffer at the hands of their perpetrator, all of this complemented with graphic displays oriented to their use with the violence questionnaires that the experts regularly use in their clinics of violence.

To achieve this, simulations are carried out taking into account real reported values of how many victims exist in a locality in the country of Mexico. Finally, a statistic of how many fatalities (deaths of the victim of violence) are predicted by the mathematical model proposed by Leal-Enríquez E., (2022) are shown.

Likewise, this work proposes the practical use of the mathematical model to predict the risk of intimate partner violence that a victim could experience based on a mathematical model that by its nature can be easily implemented computationally in care centers for victims of domestic violence.

Bibliography

[1] AR, Gutiérrez-Antúnez, et al. Mathematical Model of Predictive Indicators of Violence: Limit of Fatality. *Engineering Letters*, 2022, vol. 30, no 4.