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The impact of high-density lipoproteins and sex on the frequency of blood monocytes in older adults.

Methods

I analysed the frequency of blood monocytes in older adults using a generalised linear model with high-density lipoproteins and sex as predictor variables. I used a Poisson regression and log link function, as the response variable was measured as count data. The data is under-dispersed; a Conway-Maxwell distribution would be more appropriate to model it. However, for the purposes of this assignment, I will proceed with a regular Poisson and consider its limitations when interpreting the statistical results. For the Poisson model, factors were evaluated with a “Type II” ANOVA using the car package (Fox J & Weisberg S, 2019) because the model did not contain an interaction and therefore, only main effects were considered. All statistical analyses were executed using R and RStudio (R Core Team, 2021; RStudio Team, 2021).

Results

High-density lipoprotein ($\chi^2 = 0.8091$, $P = 0.36839$) blood levels did not affect the frequency of blood monocytes in older adults. However, the predictor variable sex ($\chi^2 = 3.5727$, $P = 0.05874$) had marginally significant effects on the frequency of blood monocytes. Perhaps reanalysis using a Conway-Maxwell distribution to better model the under-dispersed data, would uncover a significant interaction. A larger clinical sample size would also be ideal to increase statistical power and confidently derive any concrete conclusions of sexual dimorphism.

Literature cited

Fox J, Weisberg S (2019). *An R Companion to Applied Regression*, Third edition. Sage, Thousand Oaks CA. <https://socialsciences.mcmaster.ca/jfox/Books/Companion/>.

R Core Team (2021). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.

RStudio Team (2021). *RStudio: Integrated Development Environment for R*. RStudio, PBC, Boston, MA URL <http://www.rstudio.com/>.