Improving the interpretation of binary and count models.

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Discrete outcome distributions are common in clinical science, including binary outcomes (e.g., treatment relapse, presence/absence of a diagnosis) and count outcomes (e.g., number of symptoms or problem behaviors endorsed). The generalized linear model provides a flexible means of quantifying these non-linear distributions. However, due to inherent non-linearity in these models, the interpretation of their parameters is less straightforward than interpretation of linear models (such as regression). Methodologists have proposed that these models should be interpreted in the original units of the outcome (e.g., probabilities for binary outcomes, counts for count outcomes), whereas oftentimes applied researchers rely on odds-ratios or rate-ratios. We reviewed the clinical science literature and found that common practice (XX% of papers) is for researchers to provide odds ratios and risk ratios. Very few papers (XX%), however, communicated findings in a way that non-experts could understand. The current manuscript provides a tutorial on interpreting model coefficients from binary and count models. We advocate for extracting quantities of direct substantive interest such as predicted probabilities and counts and displaying these quantities in simple visual displays. We introduce a free and easy-to-use web application allowing researchers to display model results in an easy-to-understand format.