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Zero-Truncated Poisson Imprecise Probability Model for Quantifying Prior Ignorance

Prevalence estimates based on the intensity of usage of medical services are biased because zero counts are not observed. Such zero counts can be accommodated using a zero-truncated Poisson model. We quantify our epistemic ignorance by applying the imprecise probability inferential paradigm of Walley to this model. Normal and log-gamma priors are studied by constructing a three parameter exponential family of distributions which includes both priors. Finally, we present a visualization of updating as a translation on the hyperparameter space of this family of posteriors and graphically demonstrate the reduction of imprecision.