# Performance of Bayesian Priors in Validation of Correlates of Protection for High Efficacy Vaccine Trials

**Author:** Prof. Edith Umeh

**Coauthors:** Igwebuike Enweonye

**Submission ID:** 826

**Format:** CPS Paper

**Reference Number:** 826

### Presentation File

abstracts/ottawa-2023_48b6daa5d5188bd16f4d62c26da3acbc.pdf

### Brief Description

Although the use of intermediate clinical endpoint or surrogate (correlate) of protection (CoP) has increased over the years, the validation of CoP for high efficacy vaccine trials has remained a challenge due to sparse data and conventional statistical methods which are not adequate.

Be it in the frequentist or the Bayesian world, the meta-analytic approach is a well-accepted method of validation.

However, the full joint bivariate models suffer computational issues.

And there is a push for the use of individual level instead of aggregate data in validation process.

In this quest, the Bayesian approach is emerging as the future as regards the validation of CoP but one recurring criticism about this method is its application of prior distributions.

To elucidate which makes better sense, the non-informative (NIP) and weakly informative prior (WIP) distributions are compared in a meta-analytic approach using simulated data.

It was found that, 1) there are no convergence issues when either of the models are used, 2) WIP models take about 20% longer time than NIP models to converge, and 3) the NIP models consistently perform better than the WIP models.

### Abstract

Although the use of intermediate clinical endpoint or correlate of protection (CoP) has increased over the years, the validation of CoP for high efficacy vaccine trials has remained a challenge due to sparse data and conventional statistical methods which are not adequate. Be it in the frequentist or the Bayesian world, the meta-analytic approach is a well-accepted method of CoP validation. However, the full joint bivariate models suffer computational issues. And there is a push for the use of individual level instead of aggregate data in validation process. In this quest, the Bayesian approach is emerging as the future as regards the validation of CoP but one recurring criticism about this method is its application of prior distributions. To elucidate which makes better sense, in the context of CoP validation, the non-informative (NIP) and weakly informative prior (WIP) distributions are compared in a meta-analytic approach using simulated data. It was found that, 1) there are no convergence issues when either of the models are used, 2) WIP models take about 20% longer time than NIP models to converge, and 3) the NIP models consistently perform better than the WIP models.