# Meta-Analysis

Meta-Analysis on Combined Oral Antibiotic (OABP) with IV Antibiotic (IVABP) Prophylactic Use vs IAVP only in Colorectal Surgeries

## Methodology

This document provides the results of meta-analysis conducted to synthesize the results of various research evaluating the impact of oral antibiotic prophylaxis on surgical site infection (SSI). The effect sizes (risk difference or RD) were summarized using inverse-variance method and necessary heterogeneity and publication bias assessments were made.

## Summarizing Risk Difference

In meta-analysis, forest plot is being used to easily visualize individual and summary effect sizes. To help you be guided in making sense of the plot, you should know of the following:

1. The size of each box represents the weight given in computing the summary effect. Studies with larger boxes were given more weight in computing the summary effect since they are deemed to be more precise than others.
2. In the plot, precision can be easily seen through the length of the confidence interval. The shorter the interval, the higher the precision of the results. High precision means lower standard error.
3. In this case, RD is defined as the difference in incidence of SSI in experimental (with OABP) and control (without OABP) groups.

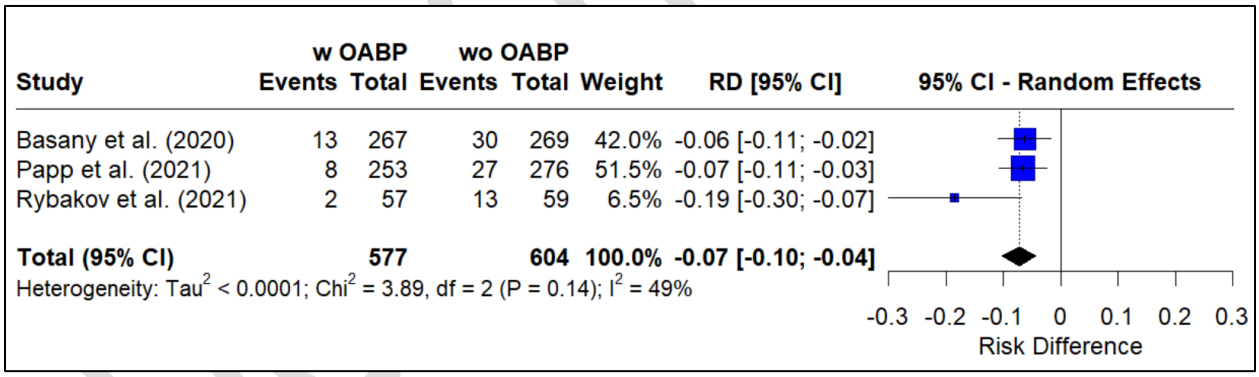


**Figure 1.** Summarized risk difference for SSI across multiple studies (p-value: <0.0001).

Figure above shows that the summary risk difference of the three studies is -0.07 (95%CI: -0.10 to -0.04). This implies that presence of oral antibiotics decreases the incidence of SSI by about 7%. This observation is expected since all studies exhibit negative risk differences which shows that this observation is consistent across the three studies. Moreover, we can say that this is significant since the confidence interval of the summary effect lies entirely below 0 and the overall p-value is less than 0.05.



Prepared by: John Robert Torres

Meanwhile, one good observation to look at is despite the study of Rybakov et al. having an RD of -0.19, the summary effect was pulled up to the scale due to giving more weights to the studies of both Papp et al., and Basany et al. since they have more precise measurement of the risk difference.

**Assessment of Heterogeneity**

Checking the heterogeneity is necessary in the analysis to check whether effect sizes vary from study to study. Results show that for both cases, p-value of the conducted Cochran's Q test are greater than 0.05, which then implies that there is no significant heterogeneity among studies considered. This then supported by the computed $\tau^2$ and $I^2$, which indicates low dispersion in observed effect sizes and low inconsistency in variance across studies' effect sizes. Hence, it can be concluded that results are consistent across all studies.

**Table 1.** Summary of test of heterogeneity across multiple studies

| Measure | Value | Df | p-value |
|---|---|---|---|
| Cochran's Q | 3.89 | 2 | 0.1431 |
| $\tau^2$ | 0.0011 | - | - |
| $I^2$(%) | 48.60% | - | - |

**Assessment of Publication Bias**

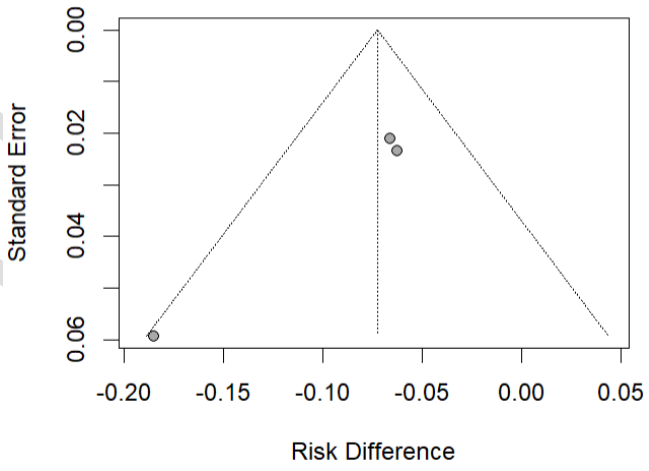


**Figure 2.** Funnel plot for publication bias