

Introduction

SWATs are often small and not powered.

It is critical SWATs use efficient and informative methods for analysis.

Bayesian methods enable historical data to be incorporated in the analysis and provide an accessible interpretation of data.

We re-analysed two previous SWATs investigating interventions to improve recruitment using Bayesian methods to explore the use of these methods.

Results are compared to the original SWAT frequentist results using p-values and 95% Confidence Intervals (95% CI's).

Case Studies

1. **Du et al (2009)** compared an 18-min educational video to standard information on recruitment to breast cancer trial,

196 participants were included in the SWAT.

2. **Mattock et al (2020)** compared participant information video clip to a standard information on recruitment to a trial with a positive parenting intervention in young children,

107 participants were included in the SWAT.

Statistical Methods

Primary Bayesian analysis used logistic regression models with non-informative uniform priors.

Sensitivity analysis used weakly to informative priors informed by similar studies.

Intervention effects reported using an odds ratio, 95% Credible interval (CrI) and the posterior probability that the intervention effect is effective (i.e. $OR > 1$).

ACCEPT plots show the probability that the video intervention is better than standard information for different intervention effect sizes.

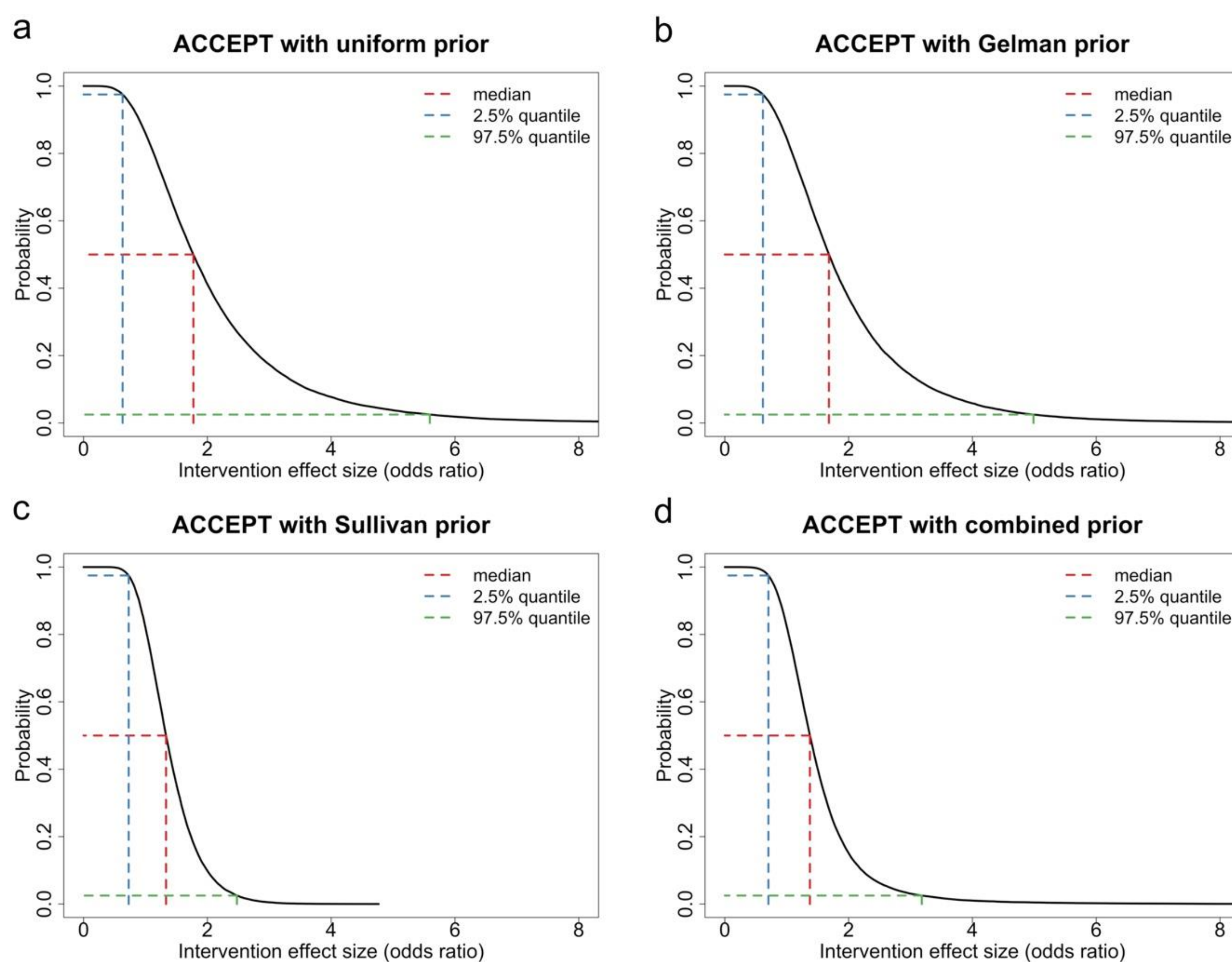


Figure 1: Bayesian ACCEPT analysis for Du et al SWAT including primary and sensitivity analysis

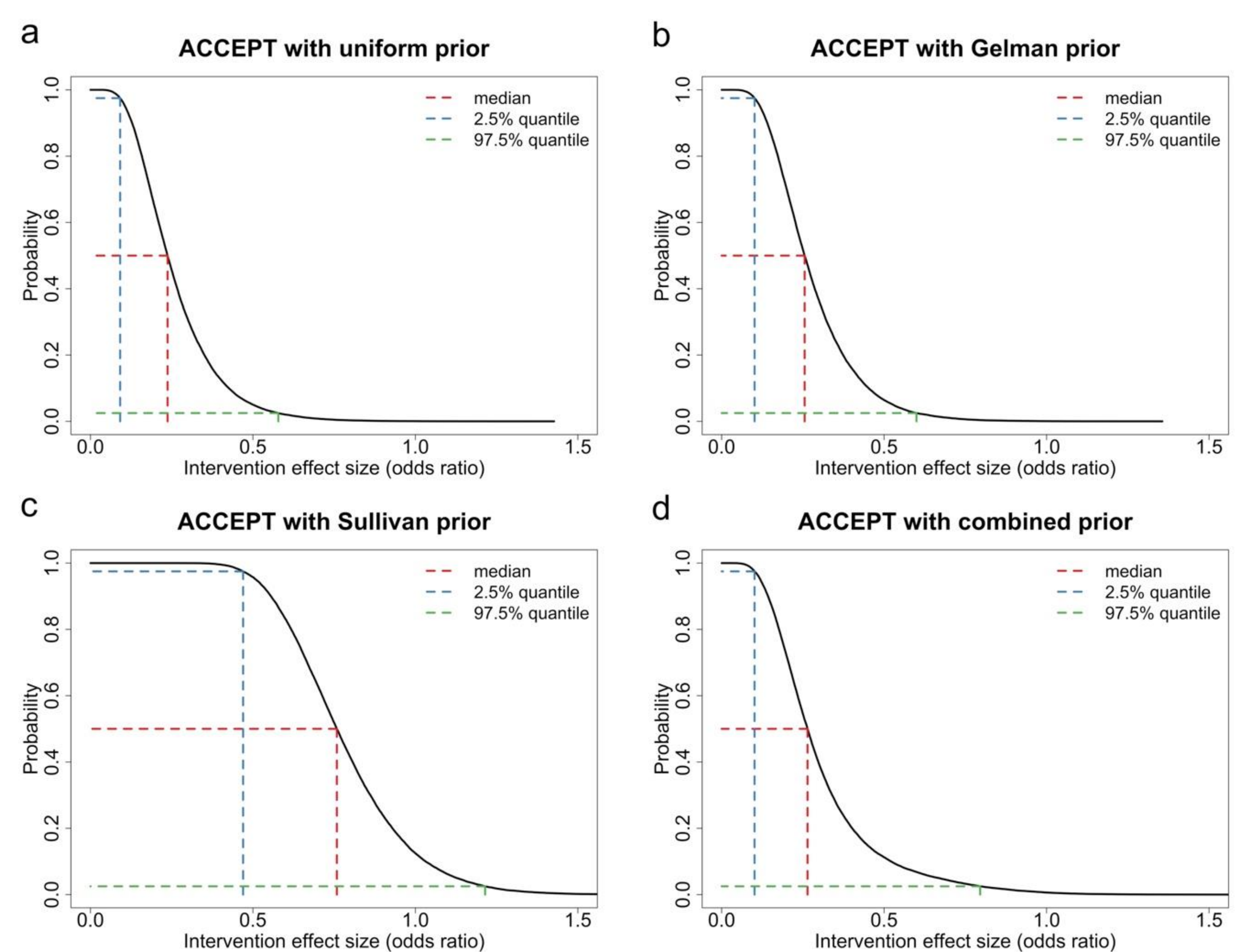


Figure 2: Bayesian ACCEPT analysis for Mattock et al SWAT including primary and sensitivity analysis

Results:

Case study 1 - original frequentist results:

OR for recruitment for video vs. standard information was 1.74, 95% CI: 0.60–5.03, $p=0.30$, favouring video but not statistically significant.

Case study 1 - Bayesian results:

-OR for video information vs. standard information was 2.12, 95% CrI: 0.38–4.67 favouring video.

-The posterior probability of the video being effective ($OR > 1$) was 0.86. Figure 1 shows moderate to high probability of the video being effective for various $ORs > 1$.

Case study 2 - original frequentist results:

OR for recruitment for video vs. standard information was 0.25, 95% CI: 0.10–0.62, $p=0.003$, favouring standard and statistically significant.

Case study 2 - Bayesian results:

-OR for video information vs. standard information was 0.26, 95% CrI: 0.07–0.51 favouring standard information.

-The posterior probability of the video being effective ($OR > 1$) was 0.0005. Figure 2 shows negligible probability of the video being effective for various $ORs > 1$.

Conclusions:

Bayesian inference and ACCEPT analyses offer solutions to challenges experienced in the analysis and interpretation of SWATs.

Greater use of these analytical approaches within SWATs will lead to a more accessible, improved evidence base on how to effectively conduct randomised controlled trials.

For more details on ACCEPT analyses see:

