

## DIGITAL SUPPLEMENT C<sup>†</sup>

Power vs. sample size curves for hotspot/coldspot tests of unconditional mean counts (full hurdle model, including zero and non-zero components).

**Figures C1-C6.** Power vs. sample size curves for hotspot/coldspot tests of unconditional mean counts (i.e., case 3 described in section 1.2). Curves are presented for the six distributions in Table 1 for which a finite mean exists for realistic parameter values (Poisson, Negative Binomial, Geometric, Logarithmic, Discretized Lognormal, and Zeta with exponential cutoff). For each distribution, nine panels show curves for different combinations of the reference mean value and the prevalence value. Within each panel lines of different colors show curves for different effect sizes, represented as multiples of the non-zero reference mean (e.g., an effect size of 0.33 for a reference mean of 10 corresponds to power to detect a coldspot with a non-zero mean of 3.3 or smaller). Note that the number of curves per panel varies, because some combinations of the reference mean and effect size do not make sense (for example, with a reference mean of 2, a 0.33 effect size would correspond to a mean of 0.66, which is not possible given that non-zero counts must be greater than or equal to 1). For distributions with more than one parameter, the first parameter is adjusted to produce the desired reference mean, and additional (“nuisance”) parameters are held constant. Curves shown are examples for the value(s) of the nuisance parameter(s) given in the figure heading. The prevalence is assumed to remain unchanged regardless of effect size (that is, changes in the mean abundance are assumed to occur through changes in the non-zero counts, rather than through changes in prevalence). [Pages 2-7]

---

<sup>†</sup>A digital file supporting OCS Study BOEM 2012-101 / NOAA Technical Memorandum NOS NCCOS 158

Citation for main document:

Kinlan, B.P., E.F. Zipkin, A.F. O’Connell, and C. Caldow. 2012. Statistical analyses to support guidelines for marine avian sampling: final report. U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs, Herndon, VA. OCS Study BOEM 2012-101. NOAA Technical Memorandum NOS NCCOS 158. xiv+77 pp.

# Full Hurdle Model – Poisson

## Monte Carlo test – one tailed – alpha=0.05

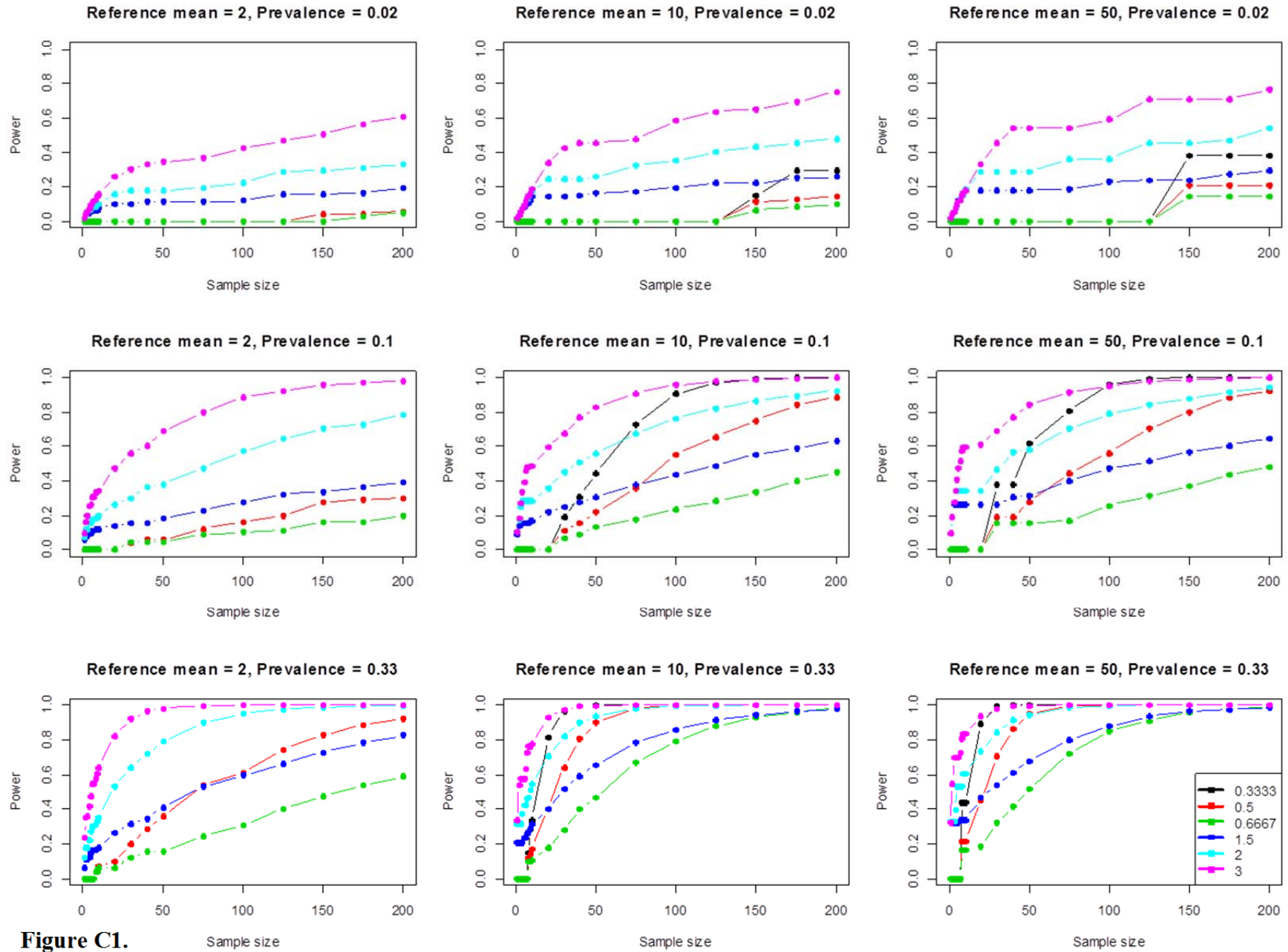


Figure C1.

# Full Hurdle Model – Negative Binomial – $r=2$

## Monte Carlo test – one tailed – $\alpha=0.05$

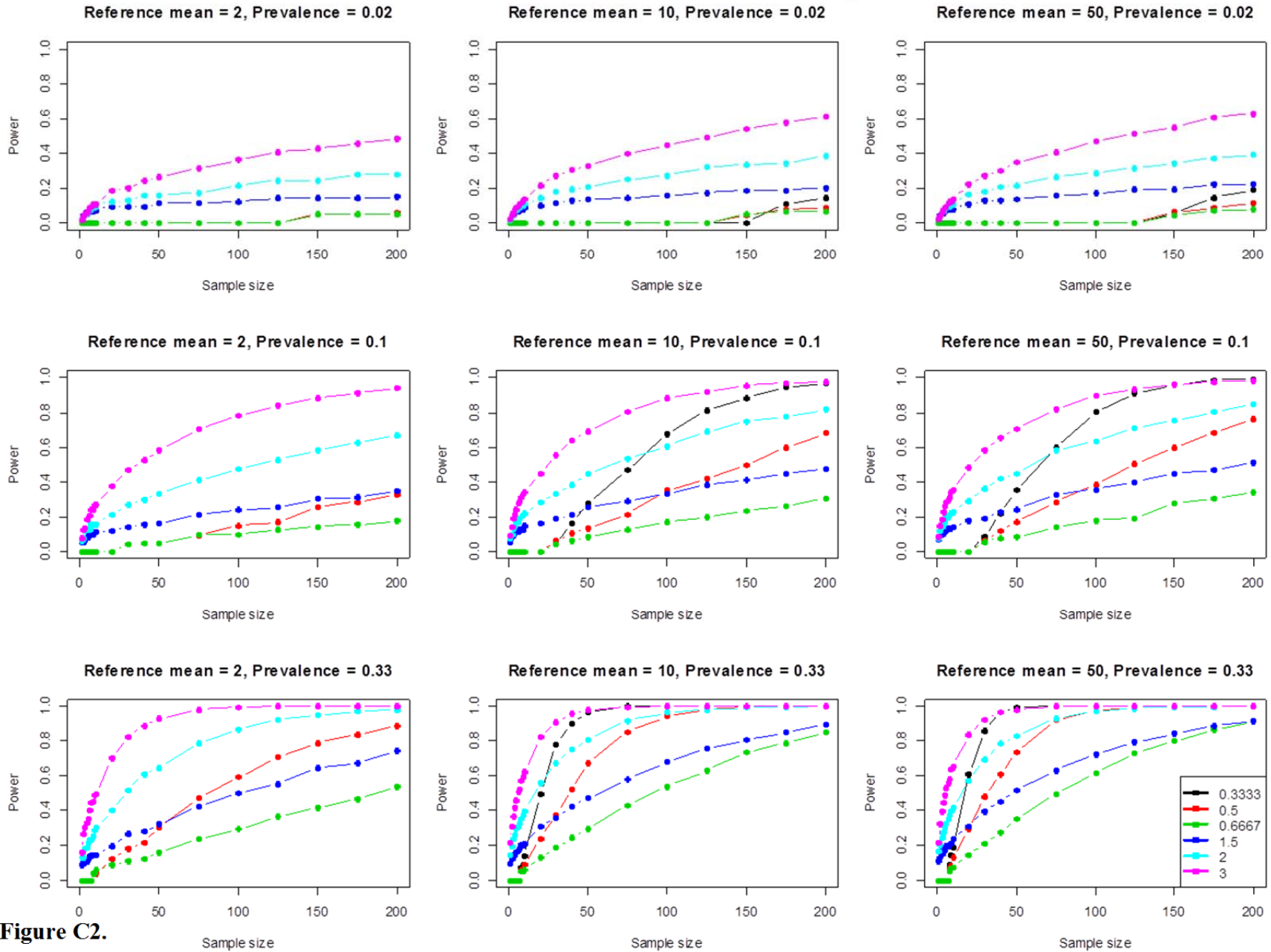
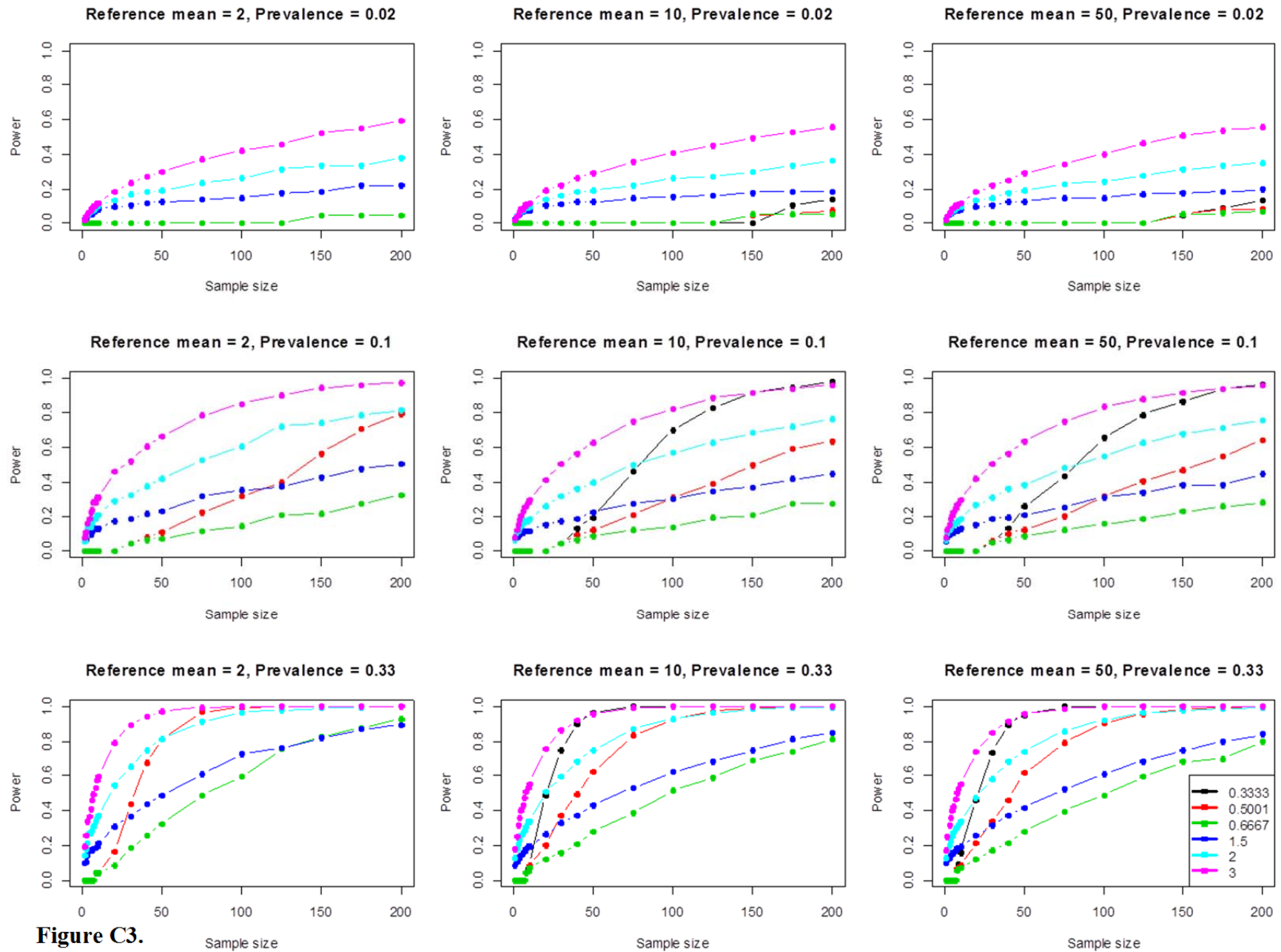


Figure C2.

# Full Hurdle Model – Geometric

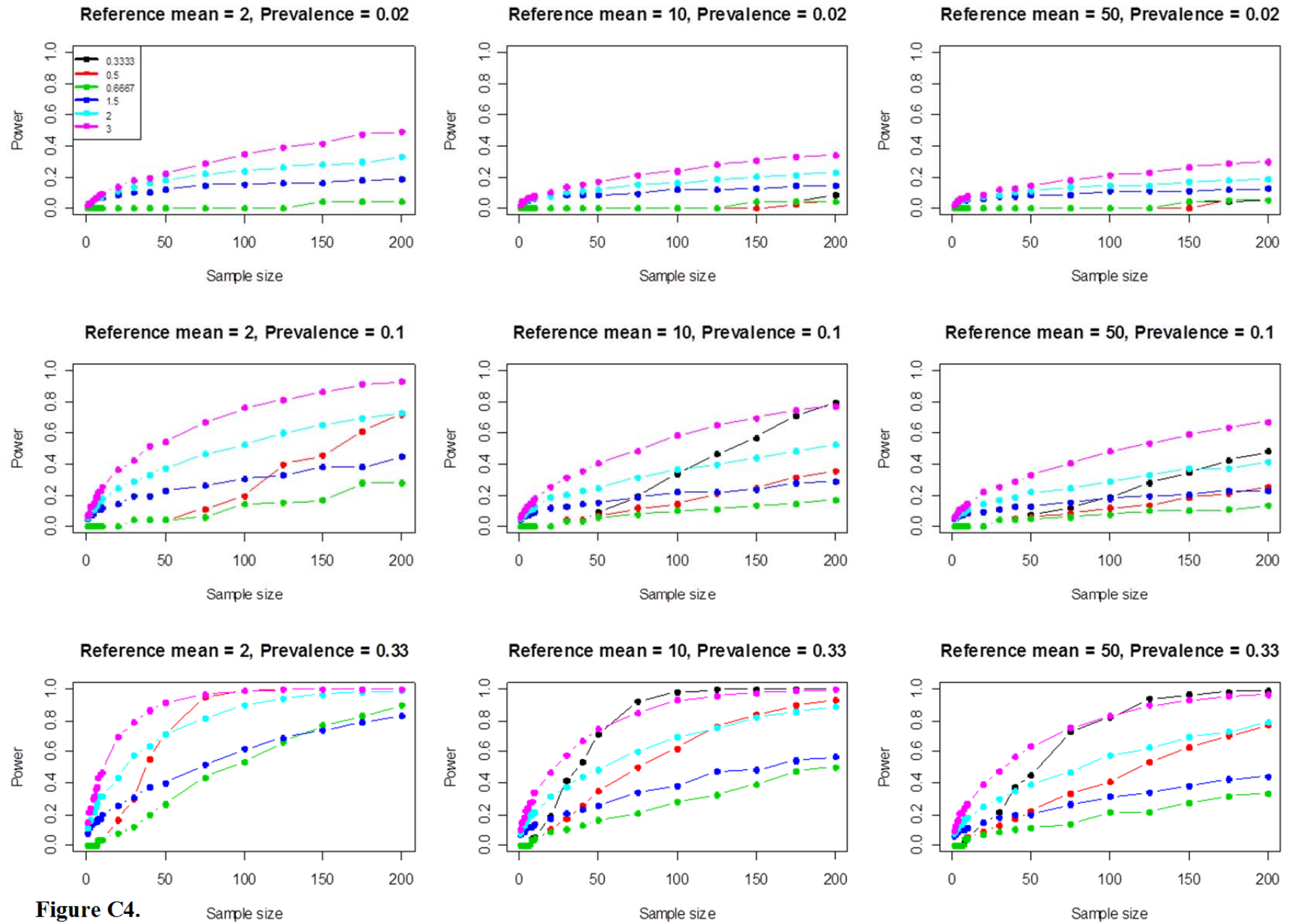
## Monte Carlo test – one tailed – alpha=0.05



**Figure C3.**

# Full Hurdle Model – Logarithmic

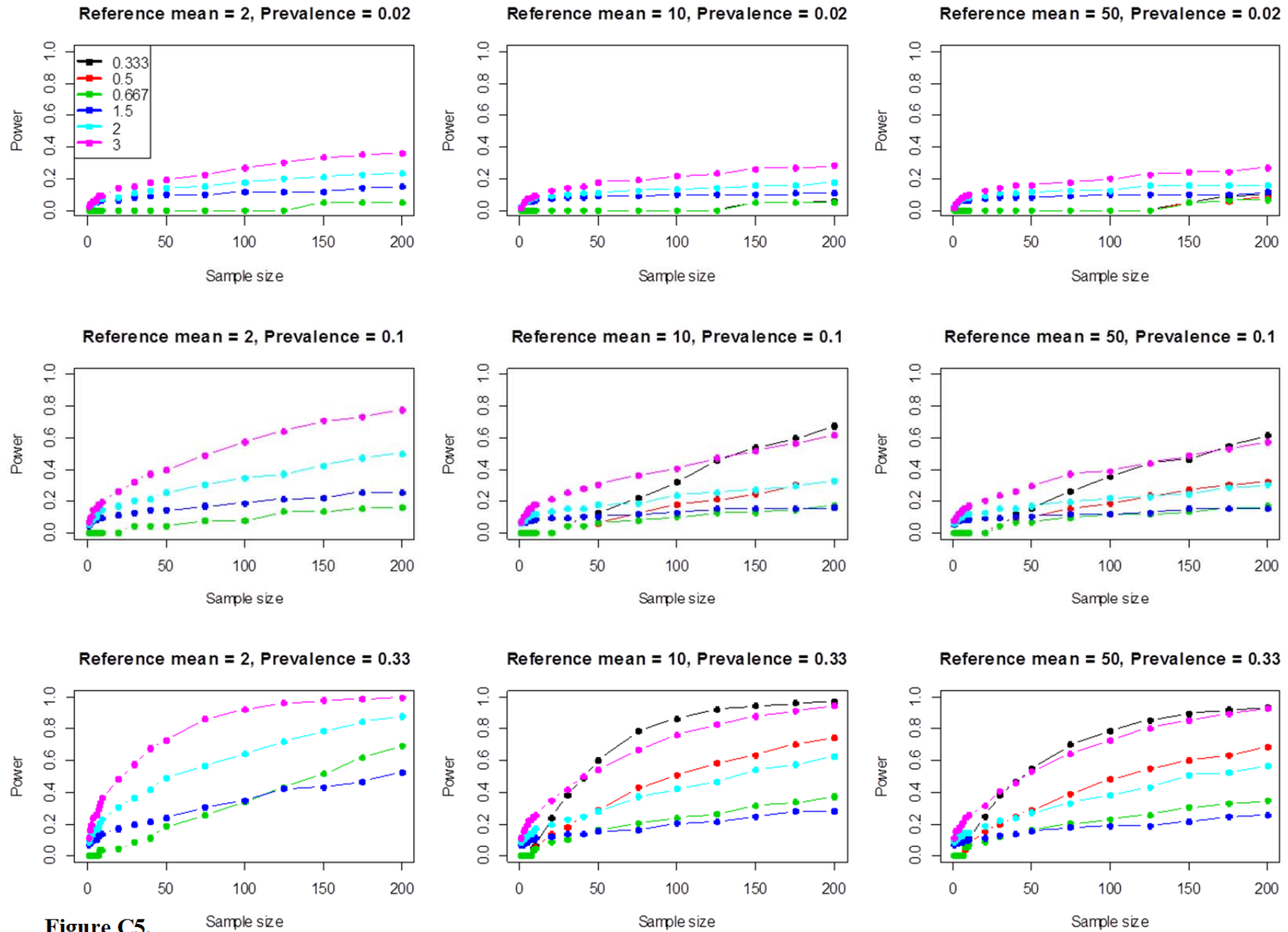
## Monte Carlo test – one tailed – alpha=0.05



**Figure C4.**

# Full Hurdle Model – Discretized Lognormal – $\sigma=1.6$

## Monte Carlo test – one tailed – $\alpha=0.05$



**Figure C5.**

# Full Hurdle Model – Zeta with exponential cutoff – $\lambda=0.0005$

## Monte Carlo test – one tailed – $\alpha=0.05$

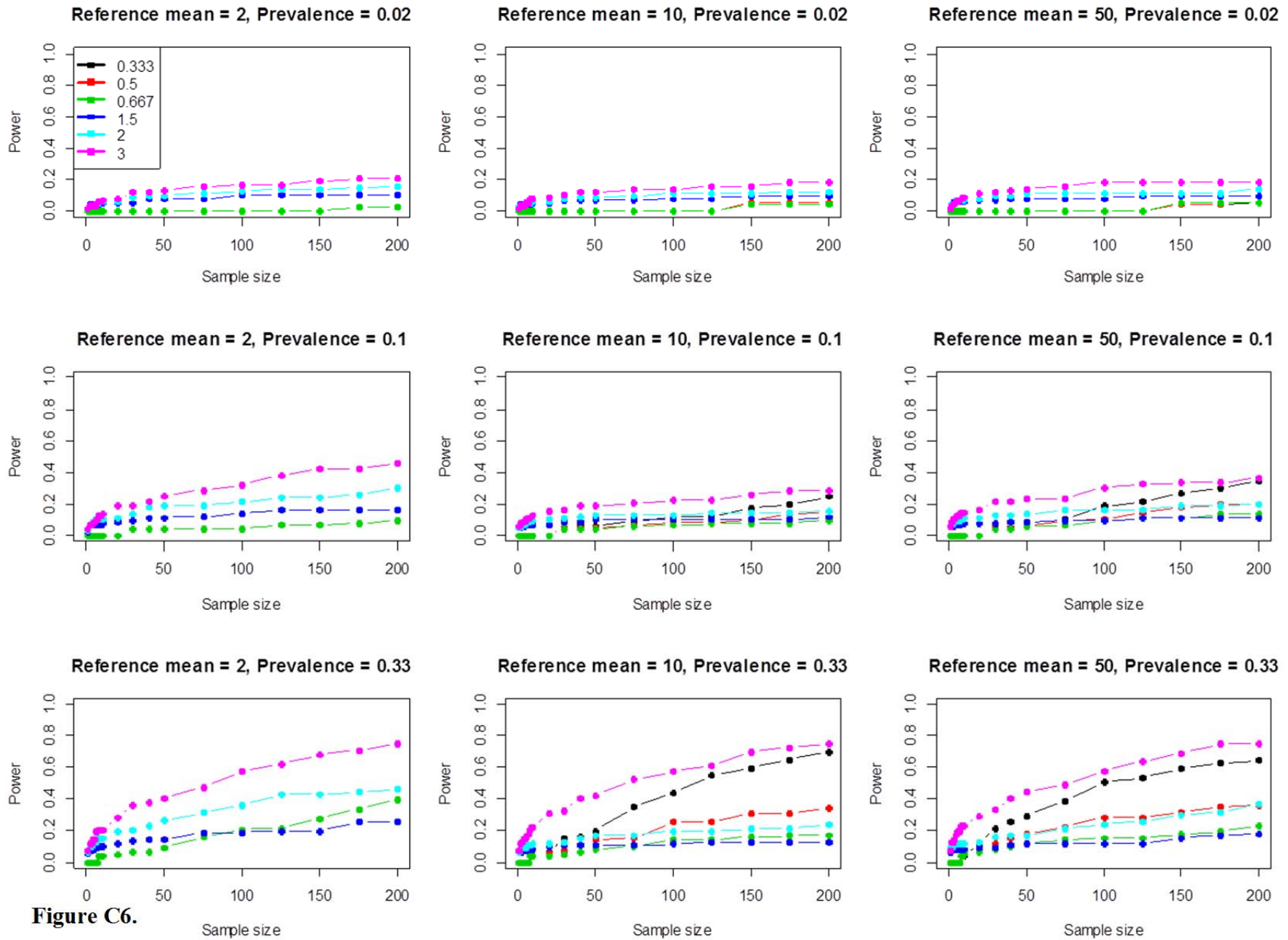


Figure C6.