MATH 38071 COURSE WORK FEEDBACK

Q1.   Commenting on the low rate of infection the authors suggest that a much larger study would be needed had the infection rate been lower. Assuming an infection rate of 5% for the placebo, determine the total number of patients that would need to be randomised to have 80% power to detect a rate ratio (RR) for placebo compared chloramphenicol treatment equal to 2, using a two-side 5% significance level z-test of proportions assuming that 5% of patients may not return for their follow-up assessment.   [3 marks]

Answer generally good

Main mistake

- Using a rate ratio of chloramphenicol compared placebo being 2 rather than placebo compared to chloramphenicol being 2

- Using formula for continuous measures rather than binary.

Q2. *The authors state "Large differences existed between the intervention and the control groups at baseline (table 2). In the intervention group, 71.7% of patients were diagnosed with non-melanoma skin cancer or solar keratosis compared with 65.1% in the control group." Briefly explain how the design of the trial could have been improved to prevent imbalance for a prognostic factor such as that referred to here.*

[2 marks]

Answer generally good

Main problems

- Suggesting block randomisation.
- Suggesting a larger sample size.

Q3. Using the delta method (see notes) derive a formula for the standard error of the log of the Rate Ratio (RR), that is loge[RR]. [5 marks]

Generally excellent answers

Main weaknesses:

Assumption of independence when considering

$$Var\left[\log_e\left[\hat{RR}\right]\right]=Var\left[\log_e\left[p_T\right]-\log_e\left[p_C\right]\right]$$
$$=Var\left[\log_e\left[p_T\right]\right]+Var\left[\log_e\left[p_C\right]\right]$$

Confusion between estimates , p_T and p_C , and parameters π_T and π_C.

Q4.

(i) Table 3 of the paper summarize the results for the outcome measure "*erythema >1 cm*". Using the result from Q4 and data from table 3, determine a 95% confidence interval of the rate ratio of *chloramphenicol* treatment compared to *placebo* for the outcome measure "*erythema >1 cm*". [2 Marks]

Answers very good, main problems

- Use of incorrect denominators.

- Using only two significant figures during calculation. Advisable to use at least 3 sf

- Forgetting to exponentiation confidence limits of

$$\log_e \left[\hat{RR} \right]$$

(ii) Briefly comment on the results of the analysis in (i) [Mark 1]

- Failing to conclude which treatment is better

- Interpretation of odd or log odds ratio.

- Confusion between rate ratios and proportions.

Q5.   By considering (a) the objective of the trial and (b) the different types of bias that may occur in clinical trials, in your own words discuss the strengths and weaknesses of this trial. (Suggested length about 250 words).   [7 marks]

1.   Answers generally good particularly as the trial had many strengths but also some quite important weaknesses.

2.   The trial was double blind - could be expected to reduce if not prevented biases rated to performance, follow-up and assessment.

3.   How good was the blinding?

4.   Choice of control group.

   a. Not a standard treatment as it had to be specially formulated.

   b. Was the high infection in the control group in the control group due to the placebo ointment

   c.   Usual care control group or third arm

5.   Clinical and Statistical significance.

6.   The trial appeared to be simple randomised. Perhaps trial could have used stratified randomisation to improve balance.