HW 10

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1)A.

Estimation of Odds ratio for Birds Vs No Birds Groups = $\frac{Odds\ of\ cancer\ in\ Birds\ Group}{Odds\ of\ cancer\ in\ no\ birds\ group} = \frac{98*328}{141*101} =$ 2.257145

Odds of getting a cancer in Birds group are estimated to be 2.257145 times higher than the odds of getting cancer in No Birds group.

B)

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odds ratio with 95% C.I. estimate   lower    upper
                 Bird    1.000000      NA       NA
                 No Bird 2.257145 1.60518 3.173915
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95% confidence interval for no birds group is (1.60518, 3.173915). As the CI does not include 1, we can reject the null hypothesis that the probability of cancer for both the Birds and No birds group are the same.

For this, we can conclude with 95% confidence that there is a relationship between bird ownership and lung cancer.

2) A)

Odds ratio of Trt Vs Ctrl for Study 1, $\lambda_1 = 0.19519$

Odds ratio of Trt Vs Ctrl for Study 2, $\lambda_2 = 1.01210$

Odds ratio of Trt Vs Ctrl for Study 3, $\lambda_3 = 0.62391$

B)

Breslow-Day p-value = 0.0001456754 < 0.001 , we can conclude that the odds ratio are different across the 3 studies .

C)

After running CMH Test using mantelhaen.test, we get

Common Odds Ratio = 0.9570013, p-value = 0.4663.

Conclusion: As 95% CI includes 1, we can not reject the hypothesis of the average of odds ratio across different studies λ_n equals to 1.

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3)A)

Sample mean , $\hat{\mu}$= 2.104167

B)

GOF test statistic = 6.340026

p-value = 0.09618956 > 0.05

Conclusion: No evidence against the poisson assumption.

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