

HS 267 HW2 Key; Assigned 2/11/10; Due: 2/18/10 12:00 PM

17.21 Random drug testing.

$$(a) \hat{p}_1 = 5 / 95 = .05263; \hat{p}_2 = 12 / 62 = .1935$$

$$(b) RR^{\wedge} = .05263 / .1935 = .2719 \approx .27$$

Using plain language, comment on this finding. The incidence of positive tests in the treatment school was about a quarter of the incidence in the control school.

(c) $\ln(.2719) = -1.302$; $SE_{\ln RR^{\wedge}} = \sqrt{5^{-1} - 95^{-1} + 12^{-1} - 62^{-1}} = .5066$; for 95% confidence, use $\alpha = .05$ and $z_{1-.05/2} = z_{.975} = 1.96$. The 95% CI for $\ln RR = -1.302 \pm (1.96)(.5066) = -1.302 \pm .9930 = -2.295$ to -0.3090 . Thus, the 95% CI for $RR = e^{-2.295 \text{ to } -0.3090} = 0.10$ to 0.73 .

(d) The confidence interval allows us to say that the population relative incidence (risk) is between 0.10 and 0.73 with 95% confidence.

ANSWER MUST REFERENCE POPULATION PARAMETER

(e) The null hypothesis is stated $H_0: RR = 1$ or "no association in the population." The 95% confidence interval for RR suggests that the value for the parameter is between 0.10 and 0.73. Thus, this H_0 is not a good hypothesis at $\alpha = .05$. **SIGNIFICANT DIF. IN RISKS @ $\alpha = .05$**

NOTE QUESTION

17.22 Cytomegalovirus and coronary restenosis. According to WinPEPI, $RR\text{-hat} = 5.571$, the S.E. of log ratio = 0.699, and the 95% CI for the RR is (1.42 to 21.93). According to the point estimate, the exposed group is at about five times the risk of restenosis. With 95% confidence we can say that data are consistent with elevations in risk of between 42% and almost 2100%.

17.23 Smoking cessation trial.

Data (randomized trial)	Cease +	Cease -	Total
Counseling + bupropren	87	158	245
Counseling alone	40	204	244

$$\hat{p}_1 = 87 / 245 = .3551$$

$$\hat{p}_2 = 40 / 244 = .1639$$

$$RR\text{-hat} = .3551 / .1639 = 2.17$$

$$S.E. \text{ of log ratio} = 0.168$$

$$95\% \text{ C. I.} = 1.56 \text{ to } 3.01$$

Interpretation: The treatment group had about twice the success rate (95% CI: 1.26 to 3.01)