10.S.3 (a) H_0: Sex ratio is 1:1 in warm environment ($p_1 = 0.5$); H_A: Sex ratio is not 1:1 in warm environment ($p_1 \neq 0.5$), where p_1 denotes the probability of a female in the warm environment. $\chi_S^2 = 0.18$. H_0 is not rejected. There is insufficient evidence (P-value > 0.20) to conclude that the sex ratio is not 1:1 in warm environment.

(c) H_0: Sex ratio is the same in the two environments ($p_1 = p_2$); H_A: Sex ratio is not the same in the two environments ($p_1 \neq p_2$), where p denotes the probability of a female and 1 and 2 denote the warm and cold environments. $\chi_S^2 = 4.20$. H_0 is rejected. There is sufficient evidence ($0.02 < P$-value < 0.05) to conclude that the probability of a female is higher in the cold than the warm environment.

10.S.12 H_0: Site of capture and site of recapture are independent ($\Pr\{RI|CI\} = \Pr\{RI|CII\}$); H_A: Flies preferentially return to their site of capture ($\Pr\{RI|CI\} > \Pr\{RI|CII\}$), where C and R denote capture and recapture and I and II denote the sites. H_0 is rejected. There is sufficient evidence ($0.0005 < P$-value < 0.005) to conclude that flies preferentially return to their site of capture.

10.S.14 (a) 1.709 **(b)** $1.55 < \theta < 1.89$
(c) The odds ratio gives the (estimated) odds of survival for men compared to women. This ratio (of 1.709) is a good approximation to the relative risk of death for women compared to men (which is 1.658), because death is fairly rare.

Unit III

III.2 **(a)** $0.025 < P < 0.05$ so reject H_0
(b) There are 6 tables to consider.

III.3 **(a)** $20 \times 32/57 = 11.23$
(b) $\chi^2 = 1.84$, $df = 2$. $P > 0.20 > 0.05$, so we retain H_0.

III.5 **(a)** $n = 49$ **(b)** $n = 66$
III.10 **(a)** True **(b)** False **(c)** False **(d)** True