STA102 Spring 2002
Chapter 6 Solutions to Suggested Even Problems

Exercises 2, 4, 6 not shown

Exercise 8

a) Not shown.
b) Since P(A) x P(B) = 0.0072 ≠ P(A ∩ B) = 0.031, these two events are not independent.
c) P(A ∪ B) = 0.162
d) P(A|B) = 0.608

Exercise 10

a) P = 0.387
b) P(Medicare ∪ Medicaid ∪ other) = 0.494
c) P(Medicare | government program) = 0.698

Exercise 12

a) P(X ≥ 5) = 0.990 (X= "number of years a newborn lives")
b) P(60-year-old lives to age 70) = P(X ≥ 70 | X ≥ 60) = 0.838
c) P(W ∩ M) = 0.702
d) P((W ∩ M^C) ∪ (M ∩ W^C)) = 0.272

Note: changed the notation in d) above from previous version.

Exercise14

a) P(T^+| cts) = 0.67; P (T^+ | no cts) = 0.42; P(cts | T^+) = 0.22
b) If the prevalence is 10% -> P(cts | T^+) = 0.15;
If the prevalence is 5% -> P(cts | T^+) = 0.08. As the prevalence of cts decreases, the predictive value of a positive test decreases as well.
c) Not shown.

Exercise 16

a) As the cutoff point is raised, the specificity increases and the probability of a false positive result decreases. Furthermore, the sensitivity decreases and the probability of a false negative result increases.
b) Not shown.
c) In this instance, the sensitivity and specificity will both be high no matter which cutoff value we select. A level of 9 ng/ml is probably best for maximizing sensitivity and specificity simultaneously.

Exercise 18

RR(Diaphragm) = 0.346
RR(Condom) = 0.246
RR(IUD) = 0.165
RR(Pill) = 0.086

Exercise 20

a) As the cutoff point is raised, the sensitivity decreases and the specificity increases.
b) Not shown.
c) The point closest to the upper left-hand corner of the graph represents an FCG level of 5.6 mmol/liter; therefore, this does seem to be the best choice of a cutoff point.