Chapter 6: 6.6, 6.12, 6.20, 6.28, 6.44, 6.48

Max Wagner

October 31, 2015

6.6

a. False, it should be about the population, not the sample.

b. True, a fixed version of (a).

c. Weird wording(false), but the point is 95% of the samples should include the population proportion.

d. False, the margin of error should be lower/narrower with a lower CI.

6.12

a. 48% represents a sample stat.

```
n <- 1259
legal <- .48
se <- sqrt((legal * (1 - legal)) / n)
z <- qnorm(.975)
me <- z * se
```

b. The CI is 0.48 +/- 0.0275967.

c. Being that the percentages are 52% and 48% (almost even), it is likely close to normal.

d. Technically the interval for legality can reach up to 0.5075967. It is a stretch but not technically wrong.

6.20

```
me <- .02
z <- qnorm(.975)
se <- me / z
n <- (legal * (1 - legal)) / se ^ 2;n
```

```
## [1] 2397.07
```

6.28

```
ca <- .08
ca_n <- 11545
or <- .088
or_n <- 4691
diff <- or - ca
se <- sqrt(((ca * (1 - ca)) / ca_n) + ((or * (1 - or)) / or_n))
z <- qnorm(.975)
me <- z * se
```

The CI is 0.008 +/- 0.009498. This interval contains 0, so they are statistically different.

6.44

a. Null: Deer do not prefer one habitat over another, and foraging is proportional to land distribution, Alt: Deer do prefer certain habitats, and foraging is not proportional to land distribution.

b. One way is to use a chi-square test.

c. The conditions state the sample should be independent, and expecteded counts should be 5 or greater.

```
expected <- c(.048*426, .147*426, .396*426, (1 - .396 - .147 - .048)*426)
actual <- c(4, 16, 67, 345)
df <- length(actual) - 1
chi <- sum(((actual - expected) ^ 2) / expected)
p <- pchisq(chi, df, lower.tail = FALSE)
```

d. P is almost 0, which means we reject the null, and say that deer do prefer to forage in someplaces over others.

6.48

a. yay more chi square

b. Null: depression and coffee consumption are unrelated, Alt: depression and coffee consumption are related.

c. do: 0.0513806, don't: 0.9486194

```
exp <- 2607 * (6617/50739);exp
```

d.

```
## [1] 339.9854
```

```
contrib <- (373 - exp) ^ 2 / exp;contrib
```

```
## [1] 3.205914
```

```
pchisq(20.93, df = 4, lower.tail = FALSE)
```

e.

```
## [1] 0.0003269507
```

f. The p value is less than .05, so we reject the null, and accept that there is a relationship between coffee and depression.

g. I agree with the author for a few reasons. The first being that a p value of .03 is convincing, but not conclusive. The second being that there could a whole lot of other variables going on these women's lives.