

Homework 6 Answer Key

Ch18.

4) EV for number of heads is 12.5, and the SE is 2.5. Chance of getting 12 heads is approximated by finding area under the normal curve between 11.5 and 12.5. The corresponding z-scores are -0.4 and 0, and the area under the normal curve between these values is about 15.54%.

14) This is like drawing at random, with replacement from a box with 4 tickets marked "1" and 6 marked "0". We want the chance that the sum of the draws will be 425 or more. The normal approximation will work, and the EV and SD of the original box are irrelevant.

To estimate the chance, we use the fact that the fraction of 1's in the box is $4/10 = 0.4$ and therefore the EV of the number of 1's is 400, and the SE of the number of 1's is about 15.5. Converting 425 to standard units, we get $z = 1.6$, which gives that the chance of getting 425 or more positive numbers is about 5.5%.

Ch19.

4) The people with college degrees were living in more suburban neighborhoods. This was not a good way to draw the sample.

5) This estimate is likely to be too high. With smaller households, the interviewer is less likely to find someone at home. So the survey procedure is, on average, replacing smaller households with larger ones.

9) The smaller one. As the size of the hospital goes up, the percentage of male births gets closer to 52%, and is less likely to exceed 55%.

Ch20.

5) Total weight is like to sum of 50 draws from a box. The average of the box is 150 pounds and the SD is 35 pounds. EV for sum = 7,500 and SE for sum = 250 pounds (rounded). The chance is about 2%.

6) Option ii is right. The absolute size of the sample is what matters.

12) The total number of interviews is like the sum of 400 draws from a box. The average of the box is 2.38 and the SD is 1.87. The total number of interviews will be around 952 give or take 37.

Ch21.

8) (a) Yes. The estimate is based on a simple random sample.

(b) $71\% \pm 1.6\%$ is a 95% confidence interval for the percentage of people in the town who are newspaper readers. (Since 1 SE is 0.008, 2 SE is 0.016 or 1.6%.)

12) Option ii is right. Most of the surveys will be within the given range, but some will have larger deviations from the true value.