Section 5.2 — Example/Cumulative Binomial Probabilities

Problem: (Parts of exercise 5.28) Records show that 30% of all patients admitted to a clinic fail to pay their bills, and the debts are eventually forgiven. Suppose the clinic treats 2000 *different* patients over a period of one year, and let x denote the number of debts forgiven. What is the average number of debts to be forgiven? Also find the variance and the standard deviation of the number of debts forgiven.

Problem: (Exercise 5.34) According to the Humane Society of the United States, there are approximately 65 million owned dogs in the United States, and approximately 40% of all U.S. households own at least one dog. Suppose that the 40% figure is correct and that 15 households are randomly selected for a pet ownership survey.

1. What is the probability that exactly eight of the households have at least one dog?

2. What is the probability that at most four of the households have at least one dog?

3. What is the probability that more than 10 households have at least one dog?

4. What is the probability that (strictly) between 3 and 9 families have at least one dog?

5. If we find in this experiment that exactly one household has at least one dog, what might you conclude about the 40% figure provided by the humane society?