

STAT 5201 HW2

2-1. Edition 2: Chapter2-Problem 1 (Edition 1: Chapter2-Problem 1)

2-2. Edition 2: Chapter2-Problem 2 (Edition 1: Chapter2-Problem 2)

2-3. Edition 2: Chapter2-Problem 6 (Edition 1: Chapter2-Problem 8)

2-4. Edition 2: Chapter2-Problem 7 (Edition 1: Chapter2-Problem 10)

2-5. Consider a population of $N=580$ patients of a clinic. A quantity of interest is the percentage of patients that overdue for a vaccination.

(a) What sample size in a SRS(without replacement) would be necessary to estimate the proportion with 95% confidence and margin of error 0.10.

(b) Suppose a SRSWR(with replacement) of size 120, yielded 27 whom were not overdue for vaccination. Give a 95% CI for the proportion of children not overdue for vaccination.

2-6. In R or your favorite computing environment, write a program that can generate a simple random sample without replacement and calculate the usual 95% confidence interval for the population mean. Construct a population of size 500 for which the usual interval based on a sample of size 50 covers the true mean less than 50% of the time. Show this is true by considering the results from 500 random samples.

For extra credit, construct a population and give a mathematical argument that shows the usual interval will cover only 10% of the time.

Note: if you are using R, you could find the handouts “Simple random sampling” and “Estimating a population mean” helpful in solving this last problem.