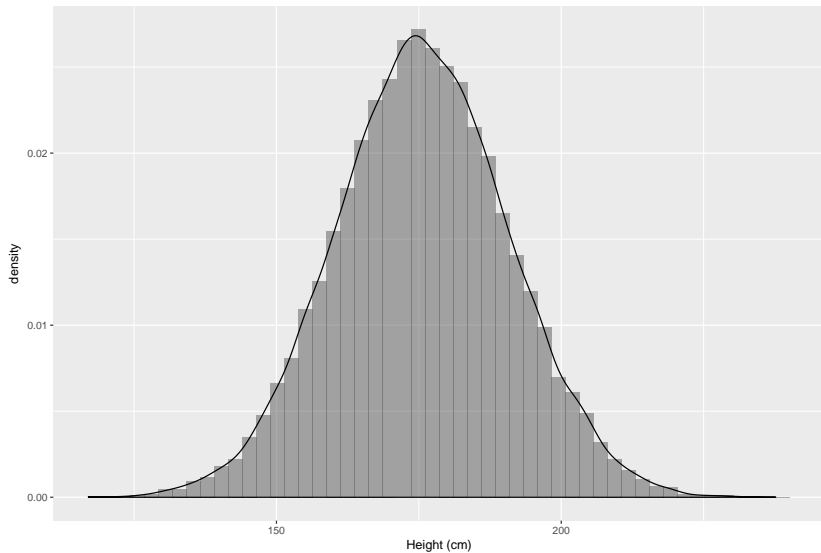


Simulating Sampling Distributions

Paul M. Magwene

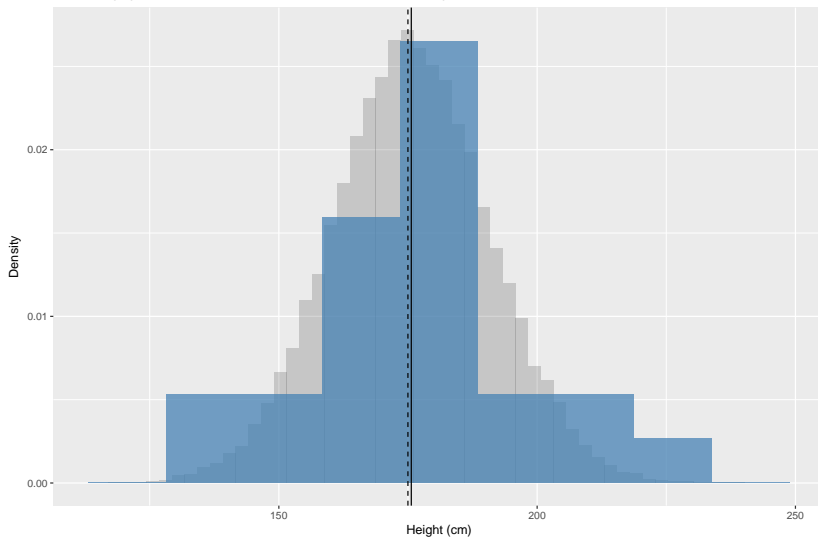
Population of interest

Distribution of Heights in the Population of Interest



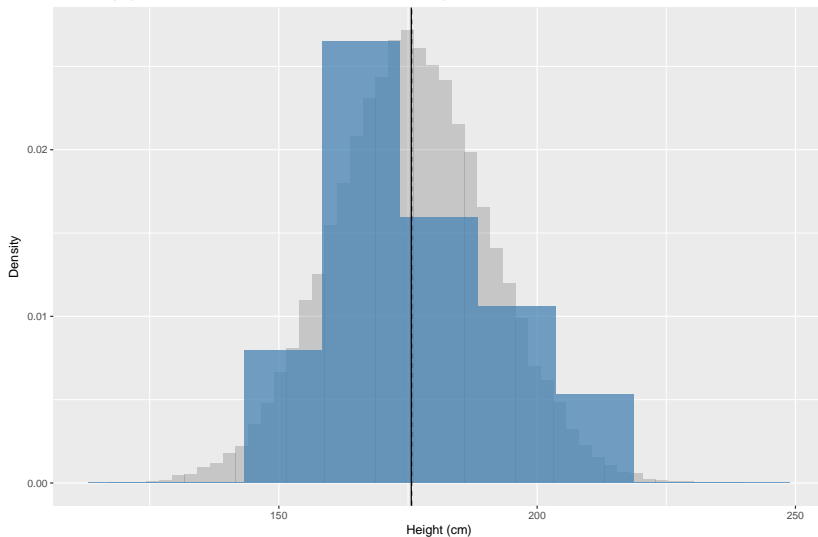
A random sample of size 25

Distribution of heights in the underlying population (grey) and for a single sample of size 25 (blue). The true population mean is shown as a solid line, the sample mean is shown as a dashed line



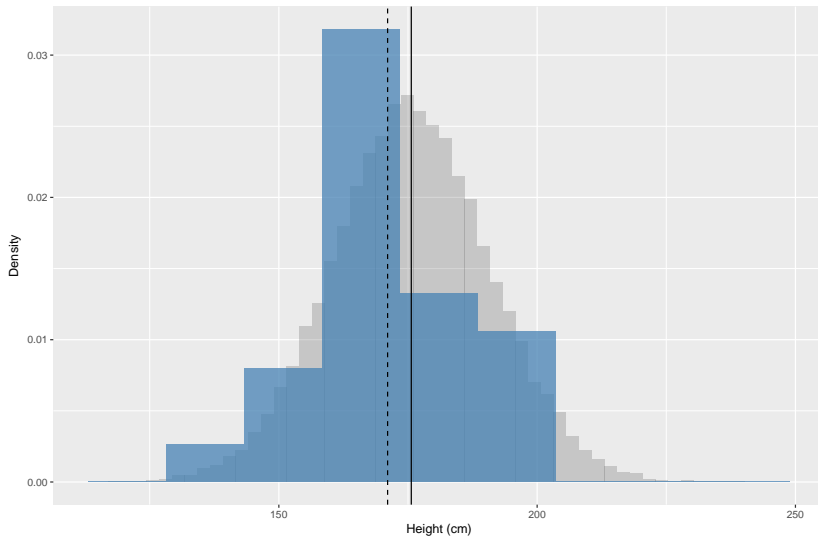
A second random sample of size 25

Distribution of heights in the underlying population (grey) and for a single sample of size 25 (blue). The true population mean is shown as a solid line, the sample mean is shown as a dashed line

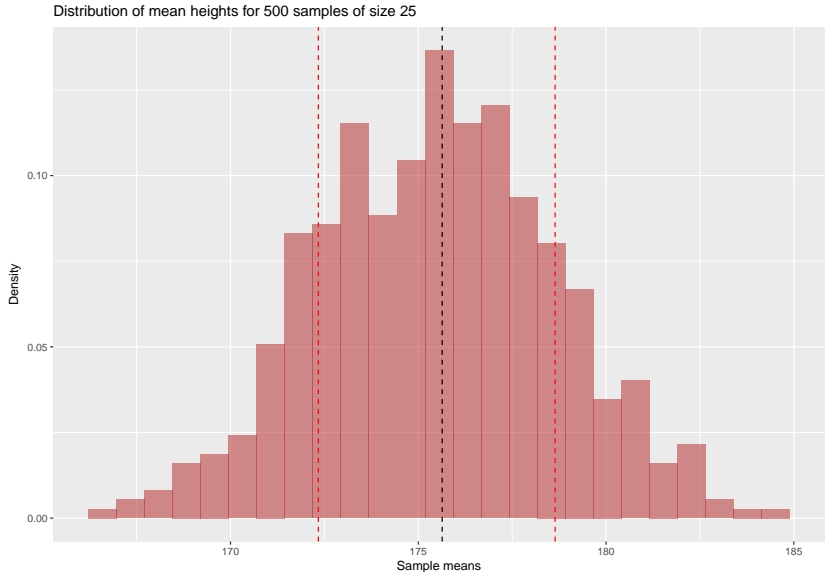


A third random sample of size 25

Distribution of heights in the underlying population (grey) and for a single sample of size 25 (blue). The true population mean is shown as a solid line, the sample mean is shown as a dashed line

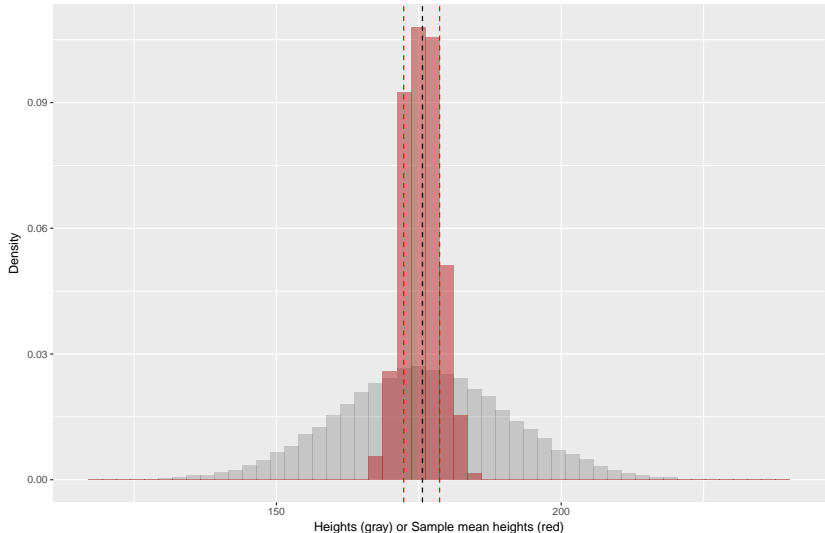


Sampling distribution of the mean: Distribution of sample means across many random samples



Comparing the population distribution to the sampling distribution of the mean

Comparison of the population distribution of heights and the sampling distribution of mean heights for samples of size 25



Sampling Distributions and Standard Errors

Sampling Distributions

The **sampling distribution of a statistic of interest** is the probability distribution of a given statistic for samples of a given size.

Standard Errors

The **standard error of a statistic of interest** is the standard deviation of the sampling distribution for the given statistic

Uncertainty

Together, the sampling distribution and associated standard error for a given statistic are key measures of the uncertainty in statistical estimates