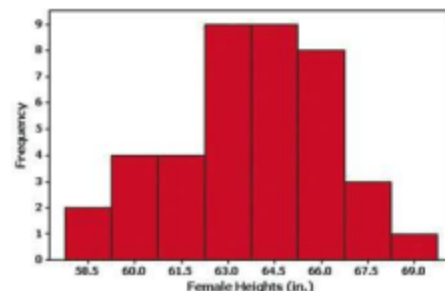
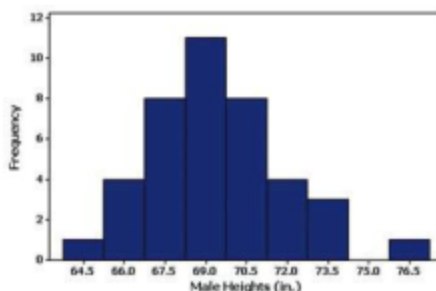


Ergonomics is the study of people fitting into their environments, and heights are extremely important in many applications. Section 4.4.2 of the Americans with Disabilities Act relates to height clearances with this statement: "Walks, halls, corridors, passageways, aisles, or other circulation spaces shall have 80 in. (2030 mm) minimum clear head room." A CBS News report identified many low-hanging signs in New York City subway walkways that violated that requirement with height clearances less than 80 in. Even when that 80 in. minimum height clearance is maintained, not all people can walk through without bending.

Due to aircraft cabin designs and other considerations, British Airways and many other carriers have a cabin crew height requirement between 5 ft 2 in. and 6 ft 1 in. For aesthetic reasons, Rockette dancers at New York's Radio City Music Hall must be between 66.5 in. and 71.5 in. tall. For practical reasons, the U.S. Army requires that women must be between 58 in. and 80 in. tall. For social reasons, Tall Clubs International requires that male members must be at least 6 ft 2 in. tall, and women members must be at least 5 ft 10 in. tall.

Given that heights are so important in so many different circumstances, what do we know about heights? Based on preceding chapters, we know that an investigation of heights should involve much more than simply finding a mean. We should consider the "CVDOT" elements of center, variation, distribution, outliers, and changes over time. We might use the mean as a measure of center, the standard deviation as a measure of variation, and the histogram as a tool for visualizing the distribution of the data, and we should determine whether outliers are present. We should also consider whether we are dealing with a static population or one that is changing over time. For heights of adults, we might refer to Data Set 1 in Appendix B to estimate that heights of adult males have a mean of 69.5 in. and a standard deviation of 2.4 in., while heights of adult females have a mean of 63.8 in. and a standard deviation of 2.6 in. (These values are very close to the values that would be obtained by using a much larger sample.) For distributions of heights, we might examine histograms, such as those shown here (based on Data Set 1 in Appendix B). Note that the histograms appear to be roughly bell-shaped, suggesting that the heights are from populations having normal distributions (as described in Section 2-3). For outliers, we might examine the histograms and note that there is one male with a height that is somewhat, but not dramatically, different from the others. Also, we know that heights are changing over time, so our studies will focus on current heights, not heights from past or future centuries.



- 6-1** Review and Preview
- 6-2** The Standard Normal Distribution
- 6-3** Applications of Normal Distributions
- 6-4** Sampling Distributions and Estimators
- 6-5** Central Limit Theorem
- 6-6** Assessing Normality
- 6-7** Normal as Approximation to Binomial