

5.5: Probability and Inferential Statistics

Probability is a tenet of statistics (see Chapter 1 for a review) and is, thus, a core component of both descriptive and inferential statistics. Probabilities and z-scores as they have been described so far within this chapter, have remained in the realm of descriptive statistics. Inferential statistics build on these concepts and use probabilities to determine what is likely true about populations based on data from samples. This is done through a variety of techniques constructed to address different kinds of data and hypotheses. What many of these techniques have in common is they:

1. Build from descriptive summaries of sample data,
2. Use those sample data and summaries to estimate patterns or differences for populations, and then
3. Calculate the probability that those population estimates are true based on the amount and strength of the data available from the sample.

In keeping with the first commonality noted above, we have already reviewed descriptive statistics starting from Chapter 2 and have begun working with probabilities in the present chapter (Chapter 5). In our next chapter (Chapter 6), we will deepen our understanding of the three tenets (variability, probability, and uncertainty) and their connections. Chapter 6 will also provide the knowledge base needed before we can use sample data to estimate population parameters (commonality 2 from above) and calculate the probability these estimates are true of populations (commonality 3 above). Therefore, following what we have just learned about z scores and probabilities, we can begin to shift from understanding descriptive statistics to exploring inferential statistics and will do just that starting in Chapter 6.

Reading Review 5.4

1. What is the probability of randomly selecting a raw score greater than $z = 1.00$?
2. What is the probability of randomly selecting a raw score lower than $z = 1.00$?
3. What is the probability of randomly selecting a raw score greater than $z = -0.85$?
4. What is the probability of randomly selecting a raw score lower than $z = -0.85$?
5. What is the probability of randomly selecting a raw score between than $z = -0.85$ and $z = 1.00$?

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