

Lesson 1.1.2

Samples, Populations, and Types of Statistical Studies

TAKE IT HOME

“Sweet Potatoes Brighten Your Skin” is the headline of an article that appeared in the magazine *Woman’s World* (November 1, 2010). The article concludes that eating sweet potatoes causes skin to be healthier because it reverses age spots, blocks harmful UV rays in sunlight, and protects against skin dryness. Consider the following five hypothetical study designs. For each study, answer the following five questions:

- 1 Is the study described an observational study or an experiment? Explain your answer.
- 2 Did the study use random selection from some population?
- 3 Did the study use random assignment to experimental groups?
- 4 Is the conclusion “eating sweet potatoes leads to healthier skin” appropriate given the study description? Explain your answer.
- 5 Is it reasonable to generalize conclusions from this study to some larger population? If so, what population?

Study Design 1: Two hundred students were selected at random from those enrolled at a large college in California. Each student in the sample was asked whether he or she ate sweet potatoes more than once in a typical week. A skin specialist rated skin health for each student on a scale of 1 to 10. It was concluded that skin health was significantly better on average for the group that reported eating sweet potatoes more than once a week than it was for the group that did not.

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Study Design 2: One hundred people who live in Miami volunteered to participate in a statistical study. The volunteers were divided into two experimental groups based on gender, with women in group 1 and men in group 2. Those in group 1 were asked to eat 6 ounces of sweet potatoes daily for 3 months. Those in group 2 were asked not to eat any sweet potatoes for 1 month. At the end of the 3 months, a skin specialist rated skin health on a scale of 1 to 10 for each of the volunteers. It was concluded that skin health was significantly better on average for group 1 than for group 2.

- 1 Is the study described an observational study or an experiment? Explain your answer.
- 2 Did the study use random selection from some population?
- 3 Did the study use random assignment to experimental groups?
- 4 Is the conclusion “eating sweet potatoes leads to healthier skin” appropriate given the study description? Explain your answer.
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Study Design 3: Two hundred people volunteered to participate in a statistical study. Each person was asked how often he or she ate sweet potatoes and a skin specialist rated skin health on a scale of 1 to 10 for each of the volunteers. It was concluded that skin health was significantly better for those who ate sweet potatoes more than once a week than for those who did not eat sweet potatoes more than once a week.

- 1 Is the study described an observational study or an experiment? Explain your answer.
- 2 Did the study use random selection from some population?
- 3 Did the study use random assignment to experimental groups?
- 4 Is the conclusion “eating sweet potatoes leads to healthier skin” appropriate given the study description? Explain your answer.
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Study Design 4: One hundred people volunteered to participate in a statistical study. For each volunteer, a coin was tossed in order to place them into a group. If the coin landed head up, the volunteer was assigned to group 1. If the coin landed tail up, the volunteer was assigned to group 2. Those in group 1 were asked to eat 6 ounces of sweet potatoes daily for 3 months. Those in group 2 were asked not to eat any sweet potatoes for 1 month. At the end of the 3 months, a skin specialist rated skin health on a scale of 1 to 10 for each of the volunteers. It was concluded that skin health was significantly better on average for those in group 1 than for those in group 2.

- 1 Is the study described an observational study or an experiment? Explain your answer.
- 2 Did the study use random selection from some population?
- 3 Did the study use random assignment to experimental groups?
- 4 Is the conclusion “eating sweet potatoes leads to healthier skin” appropriate given the study description? Explain your answer.
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Study Design 5: One hundred students were selected at random from those enrolled at a large college. Each of the selected students was asked to participate in a study and all agreed to participate. For each student, a coin was tossed in order to place them into one of two groups. If the coin landed head up, the student was assigned to group 1. If the coin landed tail up, the student was assigned to group 2. Those in group 1 were asked to eat 6 ounces of sweet potatoes daily for 3 months. Those in group 2 were asked not to eat any sweet potatoes for 1 month. At the end of the 3 months, a skin specialist rated skin health on a scale of 1 to 10 for each of the volunteers. It was concluded that skin health was significantly better for those in group 1 than for those in group 2.

- 1 Is the study described an observational study or an experiment? Explain your answer.

- 2 Did the study use random selection from some population?

- 3 Did the study use random assignment to experimental groups?

- 4 Is the conclusion “eating sweet potatoes leads to healthier skin” appropriate given the study description? Explain your answer.

- 5 Is it reasonable to generalize conclusions from this study to some larger population? If so, what population?