Section 3.9 Parameters used in Hypothesis Testing

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1.1 Section 3.9 Parameters used in Hypothesis Testing

Notes:

Now it is time to review parameters that are used in hypothesis testing.
1.2 Learning Outcomes

Notes:

1. Here are the module learning objectives.
2. Remember, the course evaluation you get to fill out will ask whether the learning objectives were appropriately covered and presented.
1.3 Level of Significance

Notes:

1. Many people confuse the level of significance, or type I error rate, with the p (probability) value.

2. One way to avoid confusion is to recognize that the type I error rate of fixed, such as a value of 0.05, whereas the p-value is calculated from the data and a probability distribution.
1.4 Relative Risk Illustration

Notes:

1. This figure illustrates that the further a relative risk estimate is from the null value of 1.0 (in either direction), the lower the p-value.

2. In other words, the p-value reflects the likelihood of observing a relative risk estimate as extreme as the point estimate (e.g. point estimate for “D” is approximately 2.5) assuming that the null hypothesis (i.e. relative risk of 1.0) is true.

1.5 Knowledge Check

(Multiple Choice, 10 points, 1 attempt permitted)
Knowledge Check

Refer to the figure below.
Assume that 3 studies (A, B, and C) are conducted all with the same sample size. Which of the following is most likely true?

- Study B will have a lower p-value than Study C
- Study C will have the lowest p-value
- None of the studies will be statistically significant
- None of the above

Feedback when correct:
That's right! You selected the correct answer.

Feedback when incorrect:
The correct answers is Study C

Notes:
This figure is a check on the concept as to how the p-value is influenced given different relative risks and their extent of departure from the null value of 1.0.
Programming note - this should be a multiple choice question for the student to complete on their computer.
1.6 Interpreting Results

Notes:

1. The point of this statement is to reinforce the concept that the p-value alone does not mean an exposure is a true cause of a disease outcome.

2. This is because the p-value is influenced by factors other than biology, such as the sample size of the study.
1.7 Conclusion