Relative Risk

Goal: Design a population-based cross-sectional research study to investigates a research question.

To determine the relationship between risk factors and outcomes, we can collect data within a population and analyze associations between variables.

Survey Question Editing:

1) Take 5 minutes to review and revise your survey questions. Check off each item below as you read through and examine your questions for these problems:

- _____ **Open-ended questions**: You should have close-ended (responses pre-set) for your risk factor & outcome. You may have one or a few open-ended questions but they should be just for the purpose of finding out additional information that may help you better understand your population.

- _____ **Double-barreled questions**: You should avoid questions asking two things at once. Split these into two separate questions.

- _____ **Leading questions:** You do not want to suggest a possible best or correct answer and you don't want some responses to seem better than others.

- _____ **Biased/Offensive/Sensitive questions:** You do not want questions to be influenced by your personal opinions or views. You also want to avoid asking for revealing personal information that is not necessary if you have a question that is about a sensitive or personal topic. With the populations we can access for a pilot-test you need to avoid questions that may invade survey-takers' privacy and confidentiality of data.

2) How many total survey questions do you have completely written? _____

When you are confident that your questions are ready for peer feedback, sign up for approval from your peers who are serving as our fictitious "Institutional Review Board (IRB)". IRBs exist at research institutions to approve studies and experiments based on ethical grounds and protection of human rights.

<u>IRB Review #1</u>: Researcher: _____

RF(s): _____   Outcome(s): _____

Suggested Changes to Questions:

IRB Review #2: Researcher: _____

RF(s): _____   Outcome(s): _____

Suggested Changes to Questions:

IRB Review #3: Researcher: _____

RF(s): _____   Outcome(s):
_____

Suggested Changes to Questions:

Informed Consent Letter:

Before anyone takes your survey, you must obtain their informed consent and explain that the survey is anonymous and confidential. A short letter, similar to the one below, should appear at the top of your survey. If you are distributing it by google form (electronically), you can include it in the description box under the title of the survey. If you are printing out hard copies, you must include it above your questions. Your survey will not be approved if you collect any data without approval and the consent letter. Collecting data from others is a serious matter and you can face significant consequences if you do not have proper authority and permission to complete a study or if you do not inform your population of information included here to ensure it is an ethical study.

Dear survey participant:

My name is _____. I am a high school student at _____ and I am conducting a research project to explore behaviors associated with unhealthy weight. Results of this project will help us learn more about the presence of these behaviors in the community.

You are invited to participate in this project. Your participation is voluntary; however, your assistance would be greatly appreciated in making this a meaningful survey.

If you decide to complete this survey, it should take about 5 minutes to complete the questionnaire below. Please fill out all questions and then click "Submit" at the bottom of the survey.

Your identity will not be revealed in the project results. Only group comparisons will be made and reported in summary form. <u>This survey will also remain anonymous, as researchers will not be able to trace your responses to your identity.</u>

For more information concerning the research and research-related risks or injuries, or for more information about this research project, please notify my instructor, _____, at _____.

Thank you for your participation in this survey.

2x2 Table Planning:

Once you have finalized your survey, you must determine which **<u>two</u>** variables (ideally a predicted risk factor-outcome pair) to quantify the relationship between. (If you have many variables, choose two to prioritize first).

Risk Factor: _____

Question about Risk Factor Variable:

Someone who **<u>HAS</u>** the Risk Factor Variable would answer: *Include exact close-ended response(s).*

Outcome: _____

Question about Outcome Variable:

Someone who **<u>HAS</u>** the Outcome Variable would answer: *Include exact close-ended response(s).*

2x2 Table Setup:

Once you have determined the responses that will indicate whether the survey takers **<u>HAVE</u>** the **<u>RISK FACTOR</u>** or **<u>LACK</u>** the **<u>RISK FACTOR</u>** and whether the survey takers have the **<u>NEGATIVE OUTCOME</u>** or have the **<u>POSITIVE OUTCOME</u>**, you are ready to organize your each person's response (once you collect them) into your 2x2 table in the appropriate location. For now, make up your data!

2x2 Table:

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┌─────┬─────┐
│     │     │
├─────┼─────┤
│     │     │
└─────┴─────┘
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Variable #1 (RF):   Variable #2 (Outcome):

Relative Risk Analysis:

Relative risk calculation shows us how much more likely the RISK FACTOR group is to experience a PARTICULAR OUTCOME (we often use the "negative" outcome) than the NON-RISK FACTOR group.

Relative Risk (RR): A ratio of the probability of the outcome occurring in the exposed (risk factor) group versus a non-exposed (no risk factor) group.

$$RR = \frac{\text{incidence rate in exposed group}}{\text{incidence rate in unexposed group}}$$

$$RR = \frac{\left(\frac{a}{a+b}\right)}{\left(\frac{c}{c+d}\right)}$$

RR Calculation:
For practice, make up the data (to total twenty responses) in the table above. Then use the formula below to calculate your RR.

$$RR = \frac{a/(a+b)}{c/(c+d)}$$

<u>What does my RR value mean?</u>
    RR = 1? No Association *The risk factor group and non-risk factor group experienced the negative outcome at the <u>same</u> rate.*
    RR = Less than 1? Negative Association (Ex: 0.9) *The risk factor group was 10% <u>less</u> likely to experience the negative outcome than the non-risk factor group.*
    RR = Greater than 1? Positive Association (Ex: 1.3) *The risk factor group was 30% <u>more</u> likely to experience the negative outcome than the non-risk factor group.*

Statement of Relative Risk: Write out what your RR value means in a complete sentence!