

Module 5B Questions:

Does Hyperglycemia Risk Differ Between Male and Female Mice? Twelve mice participated in a 12-week dietary intervention study. At the end, each mouse was assessed for hyperglycemia (“Yes” or “No”).

1. Build the 2x2 table

Compare:

- **Exposure:** Sex (Male vs Female)
- **Outcome:** Hyperglycemia (Yes vs No)

Compute the number of males and females who *do* and *do not* have hyperglycemia.

2. Calculate the risk in each group

$$\text{Risk}_{\text{Male}} = \frac{\text{Male with hyperglycemia}}{\text{Total males}}$$
$$\text{Risk}_{\text{Female}} = \frac{\text{Female with hyperglycemia}}{\text{Total females}}$$

3. Compute the relative risk (RR)

$$RR = \frac{\text{Risk}_{\text{Male}}}{\text{Risk}_{\text{Female}}}$$

Indicate whether RR > 1, RR < 1, or RR ≈ 1.

4. Compute the 95% confidence interval for the RR

Use the standard log-method formula:

$$\ln(RR) \pm 1.96 \sqrt{\frac{1}{a} - \frac{1}{a+b} + \frac{1}{c} - \frac{1}{c+d}}$$

where:

Sex	Hyperglycemia Yes	Hyperglycemia No
Male	a	b
Female	c	d

Then exponentiate the lower and upper bounds to get the CI on the RR scale.

5. Interpret the RR and CI

Discuss the following two questions based on your results:

- Do males appear to have higher, lower, or similar *risk* of hyperglycemia compared to females?
- Is your conclusion precise, or does the CI suggest uncertainty due to small sample size?