

Let's Talk: Communication Skills for Statisticians

Session #1: Asking Good Questions

Session #2: Talking about Statistics

Session #3: Presenting Statistics in a Multi-Disciplinary Setting

Core Competency: Oral Communication

- Tailors communication to the level and experience of the audience
- Utilizes strong listening skills to formulate direct, responsive answers to questions
- Effectively communicates complex ideas using analogies, visual and other techniques
- Creatively identifies and utilizes effective communication channels and methods

#3: Presenting Statistics in a Multi-Disciplinary Setting

- Conducting an Audience Analysis
- Designing Your Presentation

In my opinion: Presentation skills can improve our effectiveness whether we are making a formal presentation or participating in an informal discussion.

Let's Talk ...

Do you have an example of a meeting where a statistician presents or discusses statistical information to a non-statistical audience?

What qualities would an effective presentation / discussion of this type have?

Audience Analysis

- Who are the key members of the audience?
- What do they need to know from my presentation/discussion?

Other Considerations

1. The audience

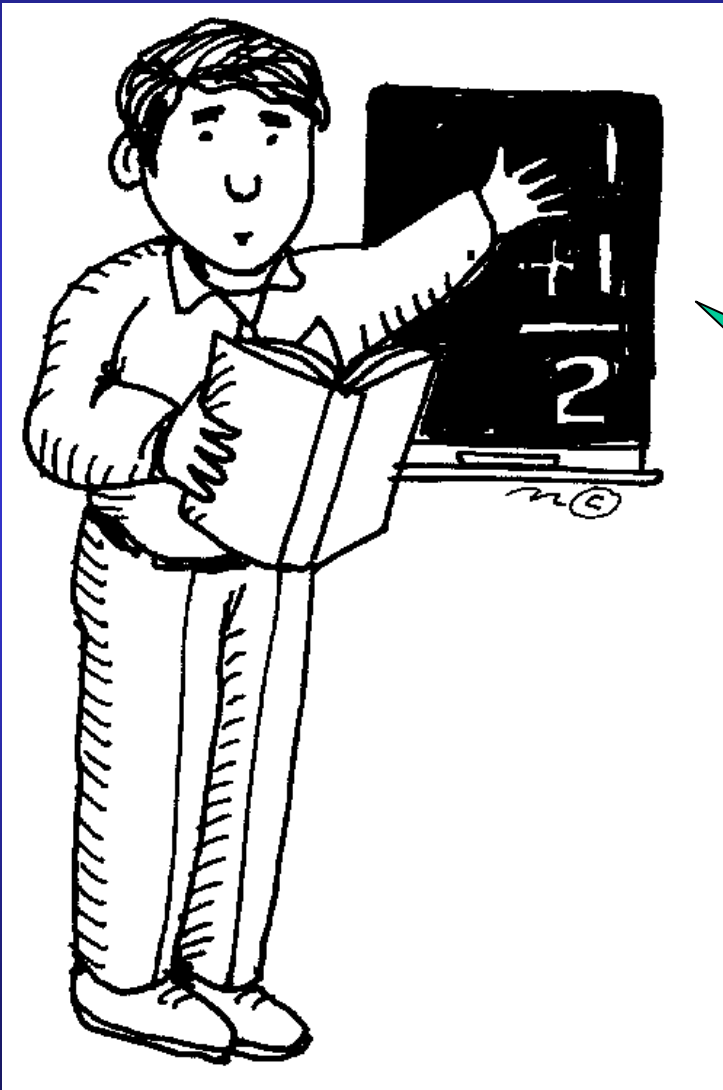
- Educational level
- Demographics
- Attitudes
- Other important features

2. The meeting

- Time frame
- Facilities

3. Other contextual factors

Audience Analysis (*not!*)



Medical Officer: What is the difference between an exact estimation method and an asymptotic method?

Statistician: The exact method evaluates all possible permutations of a hypergeometric response...

An asymptotic estimation method uses the normal distribution to approximate the distribution ...

Audience Analysis

- Who are the key members of the audience?
- What do they need to know from my presentation/discussion?

Other Considerations

1. The audience

- Educational level
- Demographics
- Attitudes
- Other important features

2. The meeting

- Time frame
- Facilities

3. Other contextual factors

Audience Analysis (*yes!*)

- Who are the key members of the audience?
Medical officers who are evaluating a drug for safety.
- What do they need to know from my presentation/discussion? *In a situation where different methods produce different results, does the statistician have a preference for one method over the others? Why or why not?*

Estimation Methods for Odds Ratio

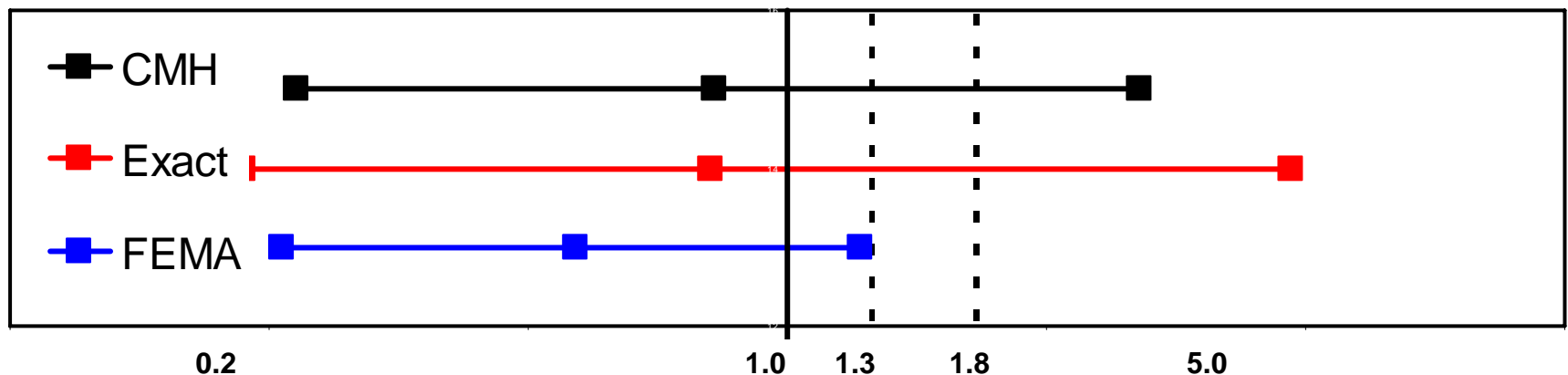
➤ Cochran Mantel-Haenszel (CMH):

- + Well established method for odds ratio
- Omits studies with 0 events in both groups
- With infrequent events assumptions may not be met

➤ Exact:

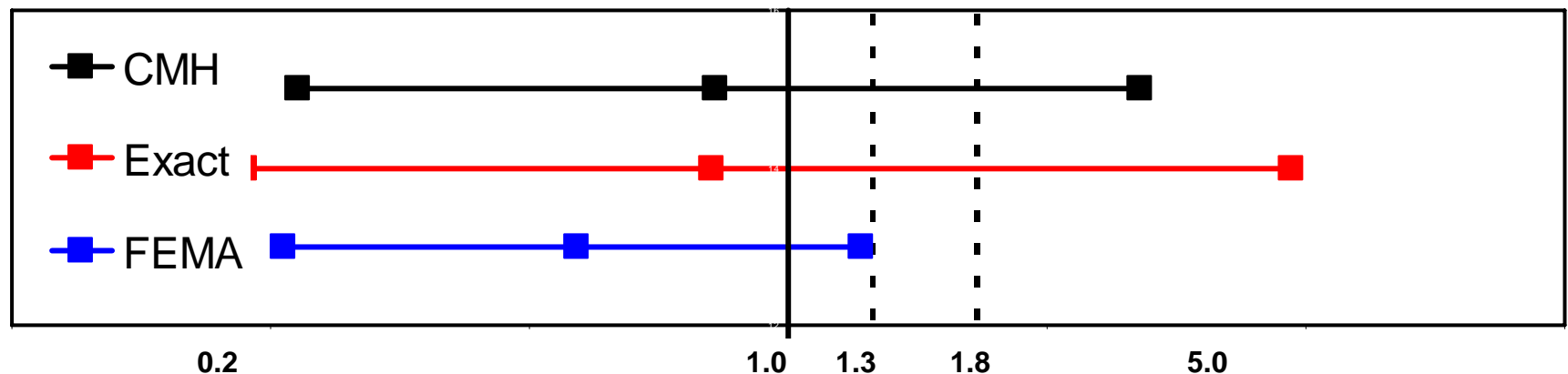
- + Assumptions are met even with infrequent events
- Omits studies with 0 events in both groups
- 95% CI tends to be conservative

“The three estimation methods that we used each had advantages and disadvantages in the stratified analysis of events that are infrequent. For this reason, we did not identify any one method as preferable to the others. Instead, we used the methods to evaluate the sensitivity of the results to method.”



“This graph demonstrates the sensitivity to method that we found in the Drug vs. Placebo comparison. You can see that the upper 95% confidence bound ranges from around 1.3 to beyond 1.8 across the set of 12 estimates.”

[Shown below are 3 of the estimates]



What is the Purpose of Your Presentation?

- What would you like to communicate to your audience?
- What would you like for them to know and/or do as a result of your presentation / discussion?

Purpose

- What would you like to communicate to your audience?
 - *Statisticians will be more effective in inter-disciplinary settings if they consider who their audience is, and plan their presentations accordingly.*

Purpose

- What would you like for them to know and/or do as a result of your presentation / discussion?
 - *Conduct an audience analysis, even for an informal setting*
 - *Develop a clear statement of purpose*
 - *Select an effective structure for the presentation / discussion*

Create the Structure of Your Presentation

- Sequential (e.g., Chronological)
 - Describe the development of a process over time
- General to Specific (e.g., Deductive)
 - Describe the general principle(s) that support your approach to a specific situation
- Specific to General (e.g., Inductive)
 - Describe the evidence that support your conclusion
- Panoramic
 - Examine a process or event from a variety of perspectives

The "Post-Its" Organizational Method

- Try out several organizational styles
- Expand your options beyond a "linear" organization



The "Post-Its" Organizational Method



Weight Loss Combination Product

General to Specific

Regulations on
combination
products

(21 CFR 300.50)

Guidance on
weight loss products
(section on
combination
products)

Results from small
weight loss study of
combination
product A+B

Recommendation:
Proceed to large
Phase 3 studies of
combination product
A+B?

Weight Loss Combination Product

General to Specific

1. **Regulations:** “Two or more products may be combined into a single fixed-dose combination when each component makes a contribution to the claimed effect or effects. [21 CFR 300.50]”



2. **Weight Loss Guidance (draft):** “...a fixed-dose combination that is associated with at least twice the weight loss observed with that of each of the individual components will be viewed more favorably than combinations that do not achieve this degree of relative weight loss.”



Weight Loss Combination Product

General to Specific

- 3. Reviewer opinion:** The results of the combination study were not conclusive about the contribution of component A to the overall weight loss in the combination product (A+B).



- 4. Reviewer recommendation:** The contribution of component A to weight loss in the combination product (A+B) should be evaluated further.

Weight Loss Combination Product

Specific to General

Study results showed the (A+B) combination had about twice the weight loss observed with that of each of the individual components A and B

Study did not enroll many subjects

Study had a lot of dropouts

Study used dosage of A that was different from proposed dosage for marketing

Reviewer Opinion: The results of the combination study were inconclusive about contribution of component A to (A+B) combination.

Presenting Statistics

The scenerio: You are discussing plans to evaluate a new weight loss program. The meeting includes a diverse group of people with different types of interest in this program. The discussion includes representatives from:

- a company specializing in weight loss programs
- the Center for Disease Control
- a grass-roots healthy weight support group
- a consumer protection group

Activity: How would you characterize your audience? What is your purpose? How would you organize your discussion?

Presenting Your Statistical Perspective to a Diverse Group

Center for
Disease Control

Company
specializing in
weight loss
products

Consumer
protection group

Grass-roots
healthy weight
support group

For Further Training on this Topic

- Presentation Skills Course
- Seek out presentation opportunities and get feedback
- Join a public speaking club