



**EUPHEM**

# Constructing a scientific argument

## The “Argument Matrix”

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Based on a presentation developed by FETP India  
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# Objectives of this session

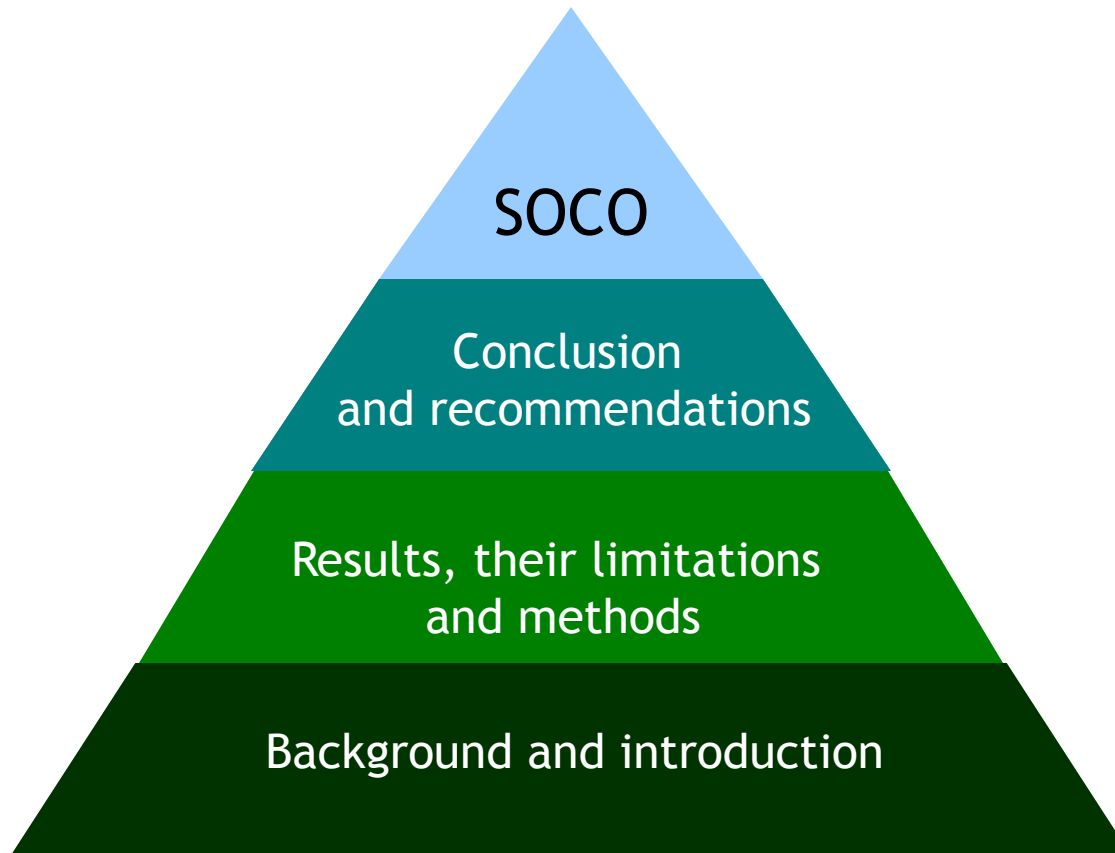
- Articulate the content of a manuscript
  - By sections
    - Introduction, methods, results and discussion
  - By ideas
- Present this organization
  - “argument matrix”

# What to communicate – the SOCO

- Take-home message
  - Objective, concise, precise

S	=	Single
O	=	Overriding
C	=	Communication
O	=	Objective

# Good SOCO: A logical way to structure communication



Anything that is not essential to support the conclusion and recommendations is harmful and must be cut out

# Starting points for a manuscript

- Products of the analysis
  - Tables and figures
- Key points and recommendations
  - Abstract
- Write down your SOCO in two or three lines
  
- Outline of the argument
  - Slide set
  - Poster

# Prepare the content

## – Focus on the SOCO

- Start by preparing the conclusions
- Prepare recommendations on the basis of conclusions
- Choose results supporting conclusions
- Explain methods to get the results
- Describe background

# Common difficulties in manuscript preparation

- Issues relating to the structure
  - Misplaced elements
    - Results in the “discussion”
    - Interpretations in the “results”
- Issues relating to ideas
  - Non-sequential ideas
  - Missing links in the development of an idea

# Objectives of the “Argument matrix”

- Provide a framework that
  - Respects the structure of the various sections
  - Develops 2 or 3 ideas logically and sequentially
- Use that framework to prepare the outline of the manuscript



# Structure

The various sections

# Main questions – the IMRaD structure

- Introduction
  - Why did you start?
- Methods
  - What did you do?
- Results
  - What did you find?
- Discussion
  - What does it all mean?

# Introduction

- Zoom in: from the general to the specific
- Familiarize the reader with the subject
- Current state of knowledge
- Provide the information that makes it clear that the study had to be done

# Methods

- Explain what was done in simple terms
- Provide key information
  - Type of study
  - Case definitions
  - Sampling strategy
  - Sample size
  - Data collection
  - Data analysis
  - Confidentiality and ethical considerations

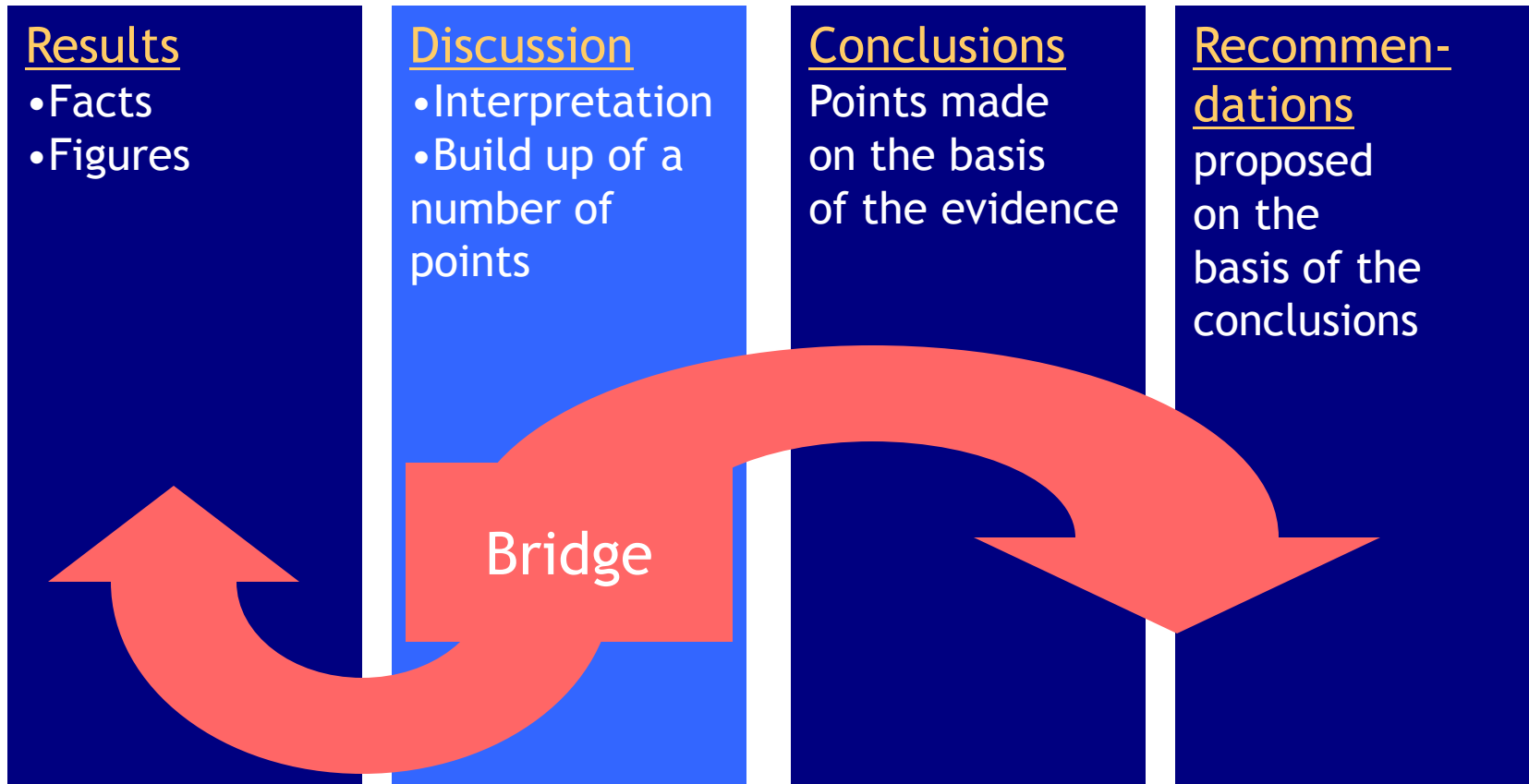
# Results

- Describe the findings in simple terms
- Describe the information in the tables as captions
  - Eg.: cases and controls did not differ with respect to baseline characteristics (Table 1)

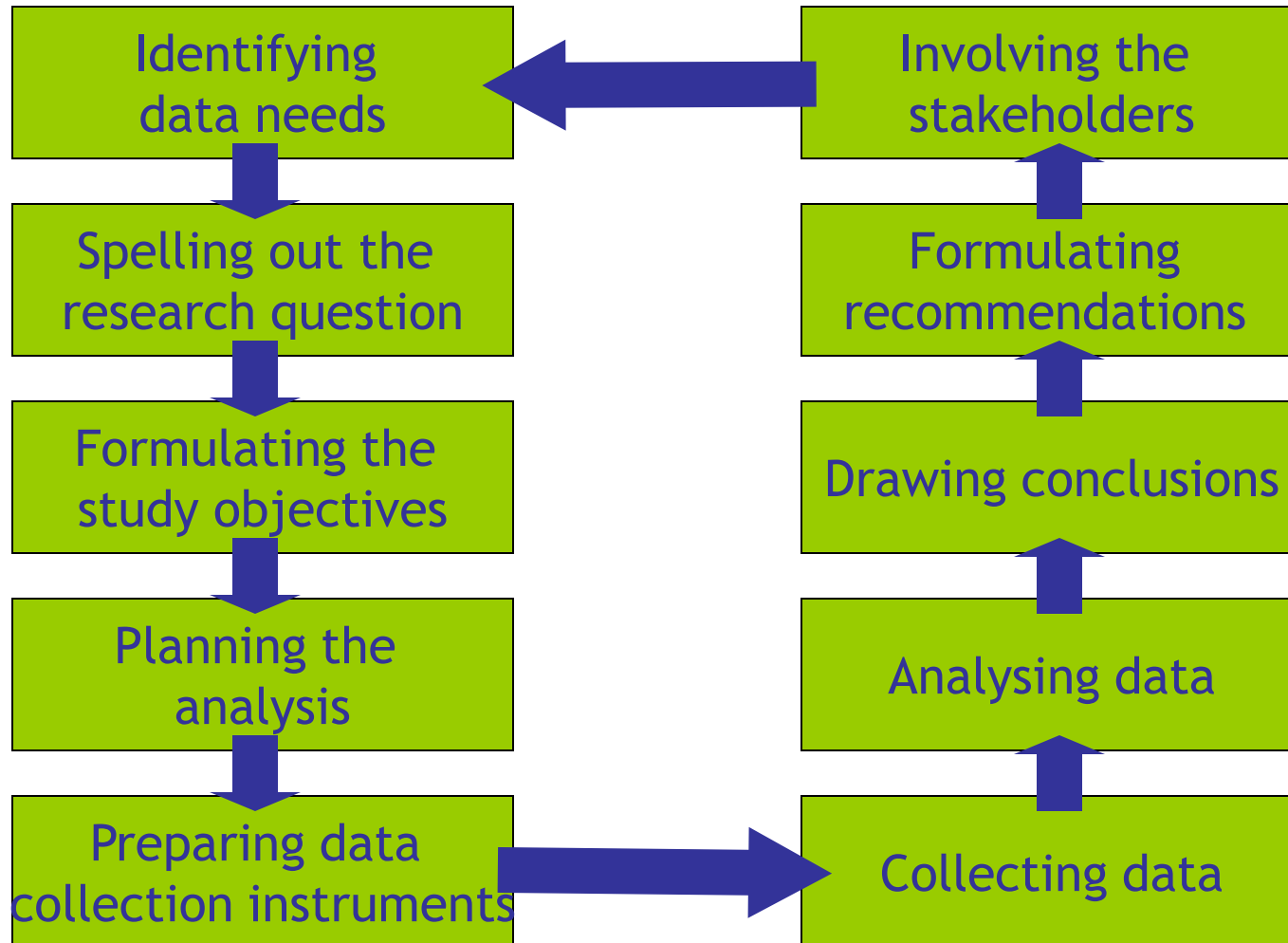
# Discussion

1. Summary of findings without quantified detailed results } What was found
2. Making points } What can be said
  - First point
  - Second point
  - (Potentially a third point)
3. Limitations } What you cannot say
4. Last paragraph of conclusion and recommendations } What you make of it

# Envisioning the discussion



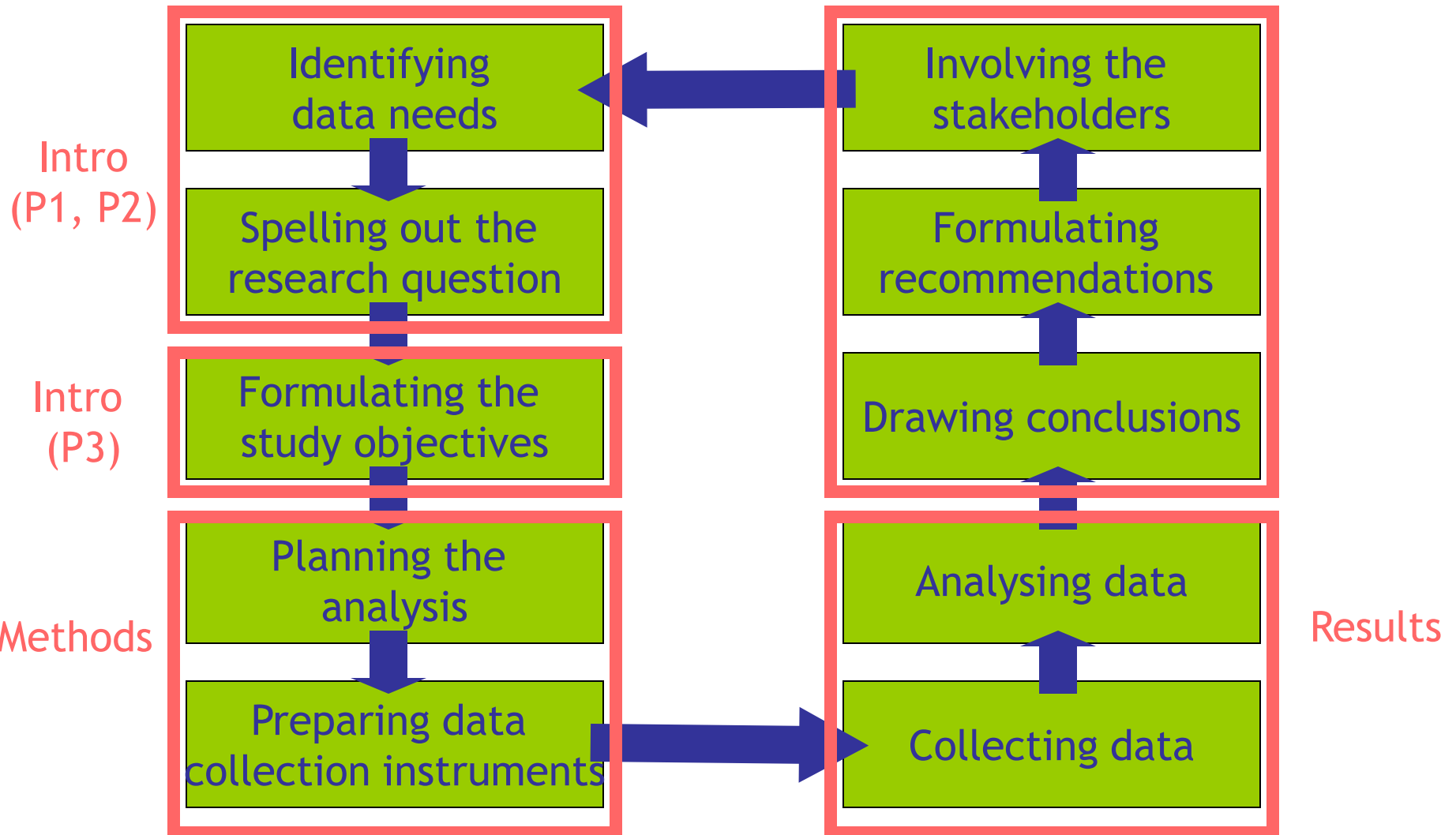
# The life cycle of an epidemiological investigation





# The life cycle of an epidemiological investigation

Discussion



# Ideas

Progression in the various sections

# Linear construction to follow one idea throughout the manuscript

- Introduction
  - What was know before, the local context
- Methods
  - The methods used to generate the finding
- Results
  - The facts and figures
- Discussion
  - Integration of all elements making the case
- Conclusion
  - The point made
- Recommendation
  - What the point calls in terms of action

# Example of linear construction: Pandemic influenza in Berlin, 2009/2010

- **Idea 1**
  - Use clinical picture + lab characteristics to distinguish H1N1 cases among hospitalized ARI patients
- **Idea 2**
  - Similar medical preconditions between hospitalized ARI H1N1+/-
- **Idea 3**
  - Questionable difference in severity between H1N1+/- ARI patients

# Pandemic influenza in Berlin, 2009/2010

- Introduction
  - Clinicians do not know who to test for H1N1
  - Risk profiles not known for hospitalized cases
- Methods
  - Case-control study comparing H1N1+/- ARI-patients
  - Information retrieved from medical files
- Results
  - More likely fever, headache sore throat and thrombopenia
  - Less likely leukocytosis and radiological pneumonia
  - Preconditions present in 70% of cases and controls
- Discussion
  - Low case number
  - Only hospitalized patients
- Conclusion
  - Indicative for H1N1: Fever + Leuko/Thrombo + Rx pneumonia
  - medical preconditions not indicative
- Recommendation
  - Indicators need to be further assessed
  - Laboratory diagnosis of H1N1 necessary

# The matrix

The organization of the ideas in the sections

# Argument matrix template to articulate the ideas of a manuscript

Ideas	Intro	Methods	Results	Discussion			
				Points	Limitations	Conclusions	Recommendations
Idea #1							
Idea #2							
Idea #3							

# Argument matrix template

<b>Ideas</b>	<b>Intro</b>	<b>Methods</b>	<b>Results</b>	<b>Discussion</b>	<b>Limitations</b>	<b>Conclusions</b>	<b>Recommendations</b>
Idea #1							
Idea #2							
Idea #3							




Direction used to develop the ideas



# Argument matrix template

Ideas	Intro	Methods	Results	Discussion	Limitations	Conclusions	Recommendations
Idea #1							
Idea #2							
Idea #3							



Direction which the paper will follow

# Uses of an argument matrix

- Primary preparation
  - Before a manuscript is started
- Secondary preparation
  - To re-organize a draft

# Uses of an argument matrix

- Primary preparation
  - Organize ideas before drafting the manuscript
    - Identify ideas
    - Lay out the points according to the sections of the manuscript
  - Helps to build consensus among all co-authors
  - Starting from the matrix prepare a high level outline
- Secondary preparation

# High level outline

- Synopsis of the manuscript
- Contains all the sections and subheadings
- “Outline view” in Word
- One bullet point per future paragraph
  - Think of what the reader will have to remember upon completion of the reading of the future paragraph

# Uses of an argument matrix

- Primary preparation
- Secondary preparation
  - Re-organize the ideas in a confused manuscript
    - Identify the main ideas
    - Prepare a blank matrix
    - Read the manuscript with a highlighter to identify the elements that belong to the main ideas
    - Within each ideas, identify the elements that belong to the various sections
    - Distribute the elements in the blank matrix
    - Identify the holes in the matrix

# Take home message

- The argument matrix helps to organize
  - The structure and
  - The ideasin the manuscript
- Use the argument matrix
  - From the beginning
  - To recover ideas from a disorganized document