Materials and Methods

When you begin writing, start with the easiest

(After the figures are ready)

1. Materials and Methods

↓

2. Results

↓

3. Discussion and Introduction

↓

4. Abstract

Materials and Methods

HOW DID YOU DO IT?

- Describe your methods with enough detail so that someone else can repeat it.

- Reproducibility!

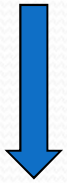
Materials and Methods: Format

- Look at examples in the journal you are targeting
  - Use of subheadings, bold, italics varies greatly between different journals
  - Determine the level of detail and style
  - Be clear on acceptable abbreviations

Ref: K. LaMarco & R. Ward

Materials and Methods: Format

General (*Subheading* or the 1st sentence of the paragraph)



Specific details (rest of the paragraph)

PCR reactions. A reaction mixture was prepared containing 50 mM KCl, 10 mM Tris, etc.

OR

Sample collection. Serum samples were collected from 300 pregnant adolescents (<19 years old) and 306 pregnant adults (>19 years old).

Materials and Methods: Organization

- In the same order that you present the results
  - Chronologically (not always the best)
    - Begin with what you did first…
    - End with what you did last!
  - The most logical flow of the science
    - Possibly in the order that experiments or other data appear in results

References in Methods

- Can refer to previous paper for methods you developed. But be specific.

EXAMPLE "cells were broken as previously described (9)."

BETTER "cells were broken by ultrasonic treatment as previously described (9)."

- Sometimes, it is good to briefly review the protocol.

"DNA was extracted as previously described (9). Briefly, cells were lysed by ultrasonic treatment and then…"

Examples from public health: two categories of articles

- Epidemiological
  - Field-based studies
- Biochemistry, Immunology, Molecular Biology
  - Laboratory-based studies

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Example: Epidemiology

Field Studies

- Study Design
- Population and Sites/Location
- Intervention and/or Survey Details
- Statistical Analyses
- Ethical Considerations

Example: Epidemiology

Field Studies

- Study design
  - What type of design? Prospective cohort? Case control?
  - Double-blind clinical trial?
- Population, location, and time period
  - How many subjects or samples?
  - Definitions of cases and controls
    - Inclusion/exclusion criteria/How were the subjects or samples selected?
    - Summarize the demographic characteristics in the results
  - Geographical location? City, Country
    - You can provide a map of the locations if it is relevant
  - When? months and years?

Example: Epidemiology

Field Studies

- Intervention or survey details
  - Sampling/Interviewing methods
  - Laboratory methods: including collection & storage
- Statistical analyses
  - Method of analysis
  - Sample size determination
  - Level of statistical significance
- Ethical considerations
  - Approval by ethical committee to use human or animal subjects

Example: Molecular Biology

Laboratory-based Studies

- Description of samples, strains
- For each experiment:
  - Reaction conditions
  - Reagents
  - Instruments
  - Name ~~and location~~ of suppliers

Example: Molecular Biology

Reaction Conditions

- Important to explain what you did so it can be repeated.
  - Not the same as a protocol but similar!!
- How much?
  - 0.5 ul of Taq polymerase
- For how long?
  - Incubated for 10 minutes
- What temperature?
  - Incubated for 10 minutes at 37°C

Example: Molecular Biology

Reagents

- What was in the reagents?
  - Tris buffer (5 mM NaCl, 5% TRIS, pH 7.6)
  - TE (10 mM Tris-HCl [pH 8.0], 1 mM EDTA)
- Need chemical concentrations in moles or micrograms/milliliters (ug/ml) most of the time.
- Occasionally will have only dilution used.
  - Such as with detergents (0.05% Tween) OR sera (diluted 1:1000 in PBS).

Example: Molecular Biology

Abbreviations

- Define all reagent abbreviations once
  (the first time they are used)
  - TE
  - TBE
  - SSC
  - DTT
  - BME

Example: Molecular Biology

Abbreviations

- Abbreviations for common techniques or buffers are not explained. (such as ELISA or PCR)

- This varies greatly between fields.

CHECK THE JOURNAL FOR LIST OF COMMON ABBREVIATIONS