

IMRAD Format

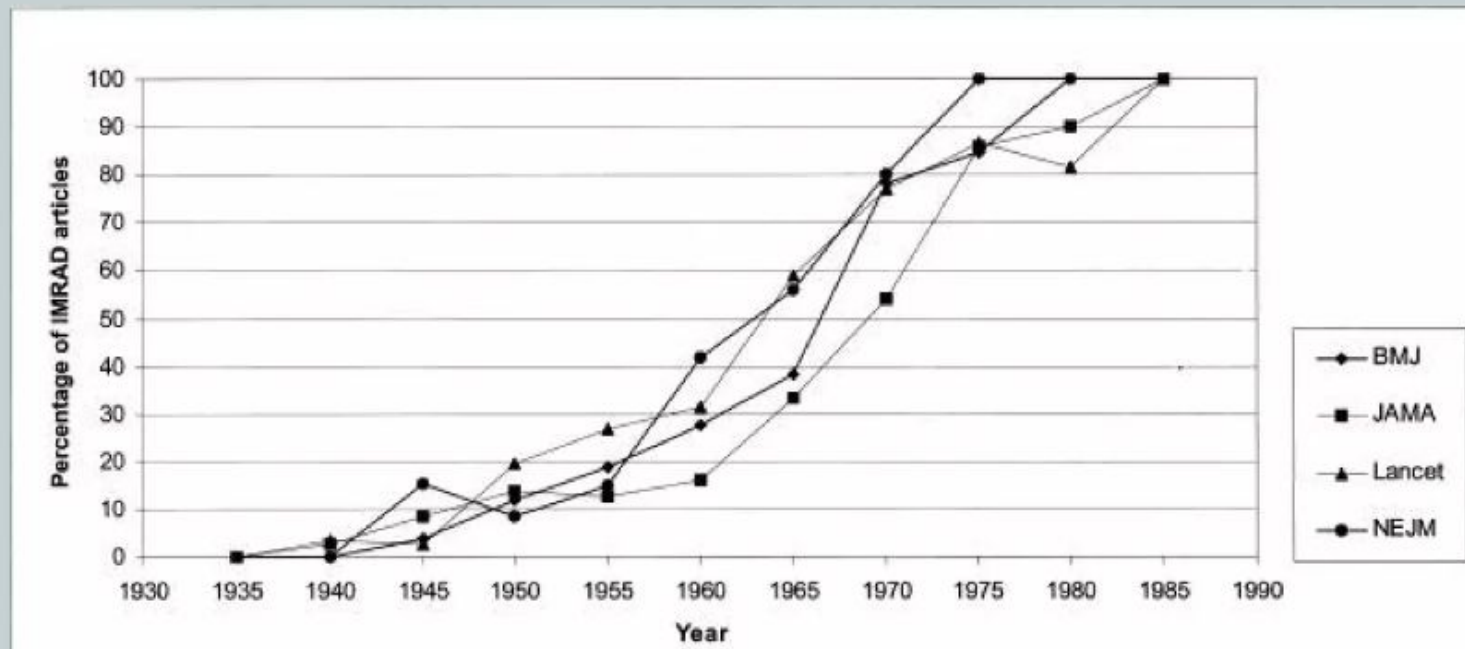
IMRAD



- IMRAD is an acronym that stands for the common sections of a scientific research or lab report.
 - Introduction
 - Method
 - Results
 - [And]
 - Discussion

Where did it come from?

- In 2004, the *Journal of the Medical Library Association* published an historical study on the origins of the format, and found that although the first instance of the format appeared in 1665, it wasn't a standardized format to well into the twentieth century



Sollaci, L.B. & Pereira, M.G. (2004). The introduction, methods, results, and discussion (IMRAD) structure: a fifty-year survey. *J Medical Library Association*, 92(3): 364–371.

- IMRAD is a standardized form that helps scientists easily find the relevant details in a research study or analysis.
- Without a narrative structure (as in a novel or story), the format facilitates reading because it not only allows readers to easily go to the section and seek the information that most appeals to them, but it helps readers cognitively chunk and make sense of information.

Part 1a – Introduction, Part 1b – Literature Review

- You begin your introduction by briefly explaining the importance of the topic, followed by clear explanation as to **why** you came up with the hypothesis that you did.
- In most scientific reports, the introduction would include an extensive review of the literature. This isn't Shakespeare, but an examination of a number of peer-reviewed research articles in sources similar to the one you are writing for to show what other researchers have done and what still needs to be done (i.e. gap), concluding with how the current hypothesis/study fills that gap.
- For some purposes, a literature review is less extensive when few studies have been published. Nevertheless, you will have to provide some details as to what made you come up with your hypothesis. Always try to cite some outside research.
- Your introduction should lead to your Hypothesis.
- You might also state your research question, but it is not required. State your hypothesis in ONE sentence, if possible. Keep it simple.
 - The hypothesis is a statement: "Students at DU believe that the minimum wage should be higher than it currently is."
 - The hypothesis is NOT a question: "Do more people work on campus or off of campus?" – is a bad hypothesis (although it is a fine title for the overall report).
 - The hypothesis is NOT an exact guess: "we hypothesized that 57.0265 percent of people feel part-time work contributes very little to helping a person get a job after college." Predict "more people."
 - DO NOT modify your hypothesis to fit your results.
- The parts and/or alternative names for the Introduction:
 - Literature Review
 - Background

Part 2 - Method

- The purpose of the method is to describe every step you performed from coming up with your experiment to performing your experiment to tabulating your experiment data, so that future researchers, if they follow your exact steps, should find the same results.
- Everything that appears in your methodology section should be described explicitly and be observable.
- A methodology section should also:
 - Determine your measurement unit (e.g. “student attitudes towards ethics at work”).
 - Define all terms (e.g. “ethics are defined as norms associated with a given work environment”).
 - Determine and allow for all possible variables (e.g. location, double counting, weather, time of day, persons who do not have jobs).
- **Parts/alternative names for Method**
 - Participants/Subjects
 - Design
 - Setting
 - Equipment
 - Procedures

Part 3 - Results

- The purpose of the results section is to tell the audience the raw data or results of your experiment.
- You would start this section by answering whether you supported or refuted the hypothesis. Next, give raw data AND percentages (or, in some cases, ratios) of your data. Use numbers. Be specific.
- Do NOT interpret the implications or significance of the results mean until the Discussion. However, you WILL interpret what the results mean in the Results section.
- Pie charts, graphs and tables can be very useful and effective, but you have to have text that describes the tables and graphs and responds to the hypothesis. All charts, graphs, tables should be labeled (e.g. Figure 1: "Title" above the graph), have a legend, and referred to in the Results section by that label (e.g. "as shown in figure 1, blah.")
- You would also report the rest of your survey responses in this section, but make sure you separate your primary hypothesis from these other results so it is clear.
- The significance of your results is NOT a result of a correct hypothesis. If you're wrong, you're wrong. The purpose of any research is to advance knowledge. By making a bad guess, you eliminate the need for another scientist to come along behind you and test the same hypothesis (although they may test the same topic with another hypothesis).

Part 4 - Discussion

- Significance, Limitations, and Implications.
- In the discussion section, you answer the “so what?” question. You Analyze and Discuss the results.
 - What do these results tell?
 - What use is the information?
 - Did anything happen you didn't expect? How did that influence the results?
 - Did you goof?
 - Did you forget to allow for all variables?
 - Do you have suggestions for future researchers?
 - Maybe a question you asked provided a new avenue of research?
- Remember: you can revise the report, but you can not redo the research. If it's a disaster, say so, and say why. “Discussion” is the place for you to speculate why you found what you found. It's also the place to say anything else that doesn't belong in other sections of the report.
- Implications should both address what it means now that you have found what you found, as well as suggest avenues for further research