

Tiffany B. Kindratt

Big Data for Epidemiology:

**Applied Data Analysis Using
National Health Surveys**

Big Data for Epidemiology: Applied Data Analysis using National Health Surveys

Chapter 11: Dissemination

Part 2 Manuscripts

Tiffany B. Kindratt, PhD, MPH

Chapter 11 Outline

- 11.1 Introduction
- 11.2 Abstracts
- 11.3 Presentations
- **11.4 Manuscripts**
- **11.5 Writing Tips and Tricks**
- **11.6 Summary**
- **11.7 References**

11.4 Manuscripts

- The final step in research process
- Writing manuscripts is teachable skill

Scientific Writing	Creative Writing
Formulaic Short Concise Simple sentences Simple prose Talent not very important	Not formulaic (usually) Any length Not necessarily concise Simple or complex sentences Simple or complex prose Talent very important

11.4 Manuscripts

5 Principles of scientific writing

1. Clarity (Plain English)
2. Simplicity
3. Conciseness (as few words as possible)
4. Exactness (accuracy)
5. Authenticity (trueness to form)

11.4 Manuscripts

- Adhere to word counts, referencing, other specific guidelines
 - American Psychological Association (APA), American Medical Association (AMA)
 - Original research: 3,000-5,000 words
 - Brief reports: 1,000-2,500 words
 - Letters to editor: ~500 words
 - Blinding of manuscripts
- Tailor the way you write to journal style
 - Active or passive voice
 - Simple sentences
 - Simple words
 - Subject up front
 - Topic sentences
 - Planned repetition
 - No adverbs (No “ly”ers)
 - Use past tense!!



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11.4.1 Manuscript Sections

- Title page (blinded or unblinded)
- Abstract and keywords

Full Text
Introduction
Methods
Results
Discussion

Full-text aligns with
processes of
scientific discovery



Scientific Discovery
-Identifying research question
-Selecting study approach -Designing and collecting data
-Analyzing results
-Reporting findings

- Section sub-headings
 - Literature Review in Introduction
 - Variables in Methods
 - Multivariable Regression in Results
 - Strengths and Limitations in Discussion

11.4.1 Manuscript Sections

- Writing checklists helpful for ensuring standardized reporting of research articles

Study Design	Checklist
Cross-sectional, case-control, cohort	Reporting of Observational Studies in Epidemiology (STROBE)
Randomized clinical trials	The Consolidated Standards of Reporting Trial (CONSORT)
Systematic reviews and meta-analyses	The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)

11.4.1.a Abstract

- Brief summary of the article
- Most important part of the research article!
 - 1st first thing that readers see prior to accessing and reading full articles
 - Free to everyone online whereas full-text may require fees
- 2 strategies when writing your abstract
 1. Write before the final manuscript as an outline
 2. Write abstract after completing the paper and rephrase key points from the completed sections
- Need to ensure consistency between abstract and text

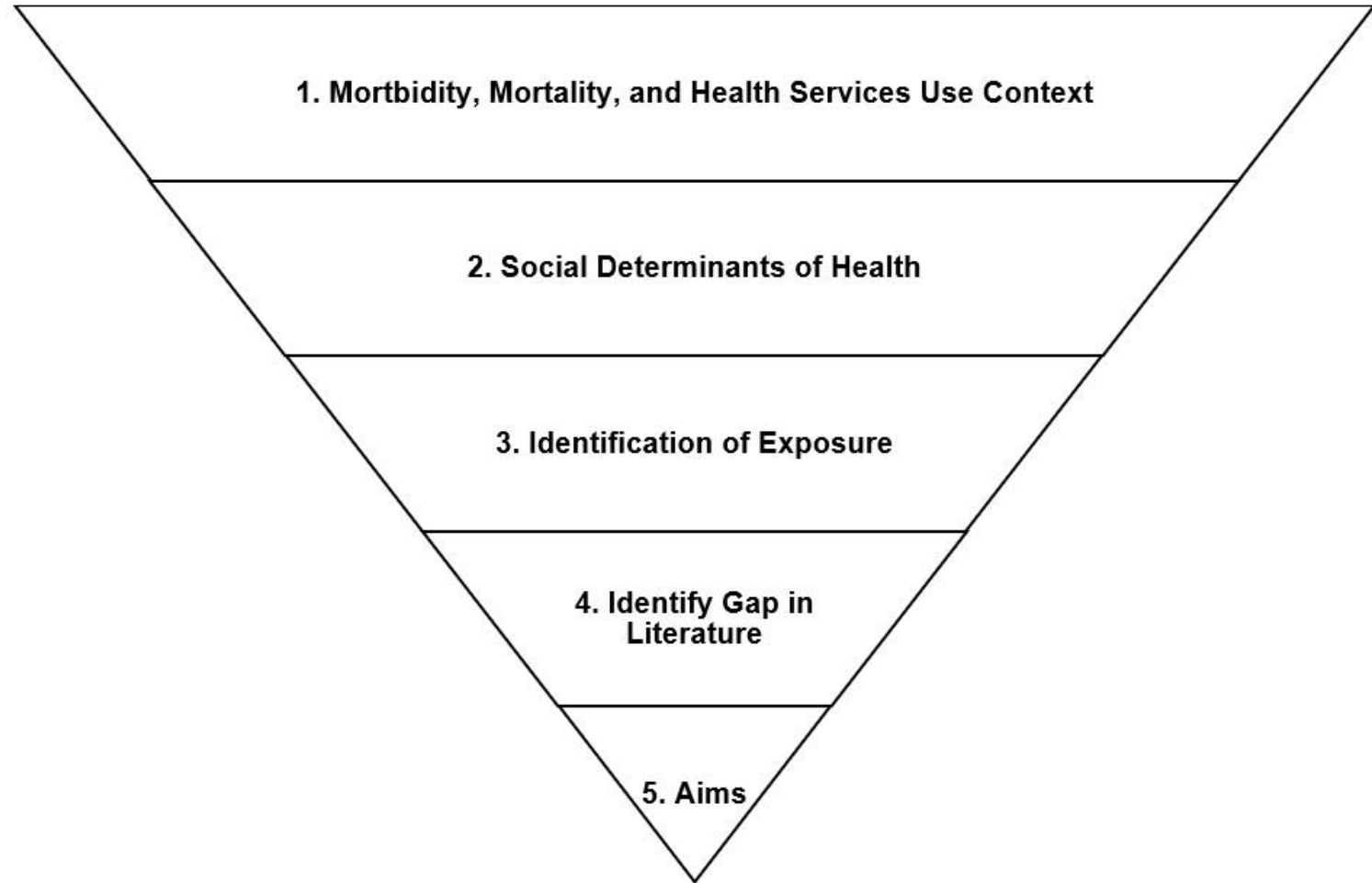
11.4.1.b Introduction

- Funnel or inverted pyramid as framework
- Describe importance and rationale of the study from a broad perspective
- Narrow down to the specific aims in the study



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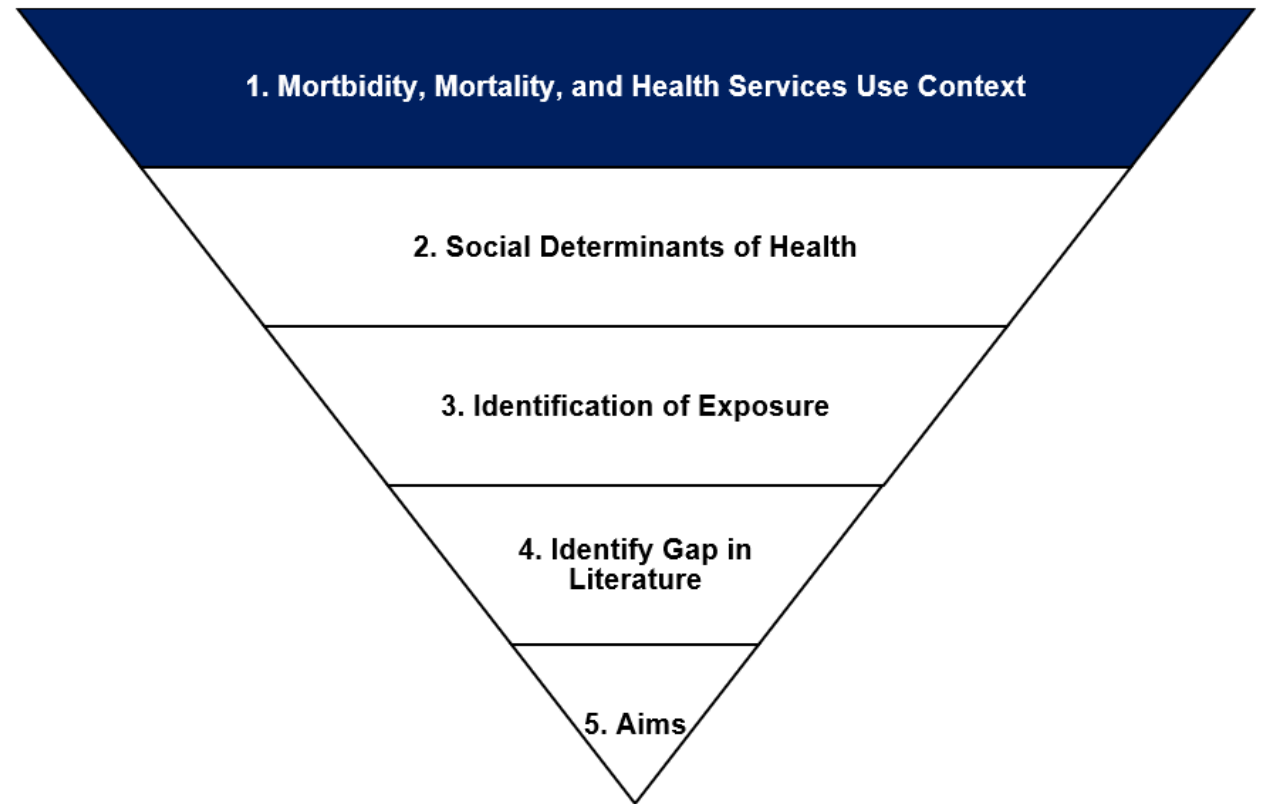
**Figure 11.4
Overview of
Introduction Section
Inverted Pyramid
Outline for Writing
Manuscripts Using
National Health
Surveys**



11.4.1.b Introduction

First paragraph

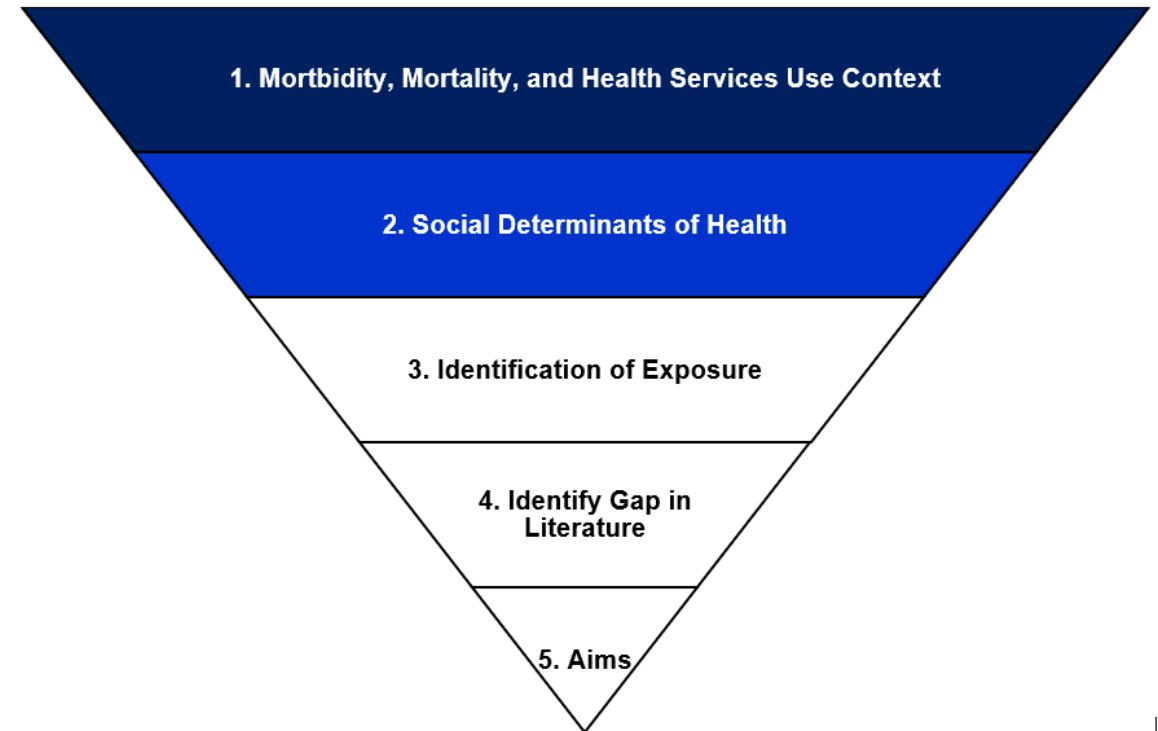
- Broad context
- Contextualize the outcome/dependent variable
- “What is the morbidity and/or mortality of the disease and outcome under investigation?”
- Alzheimer’s disease and related dementias (ADRD) as outcome
 - Over 6 million individuals with ADRD in the United States
 - Treatment costs over \$350 million per year



11.4.1.b Introduction

Second paragraph

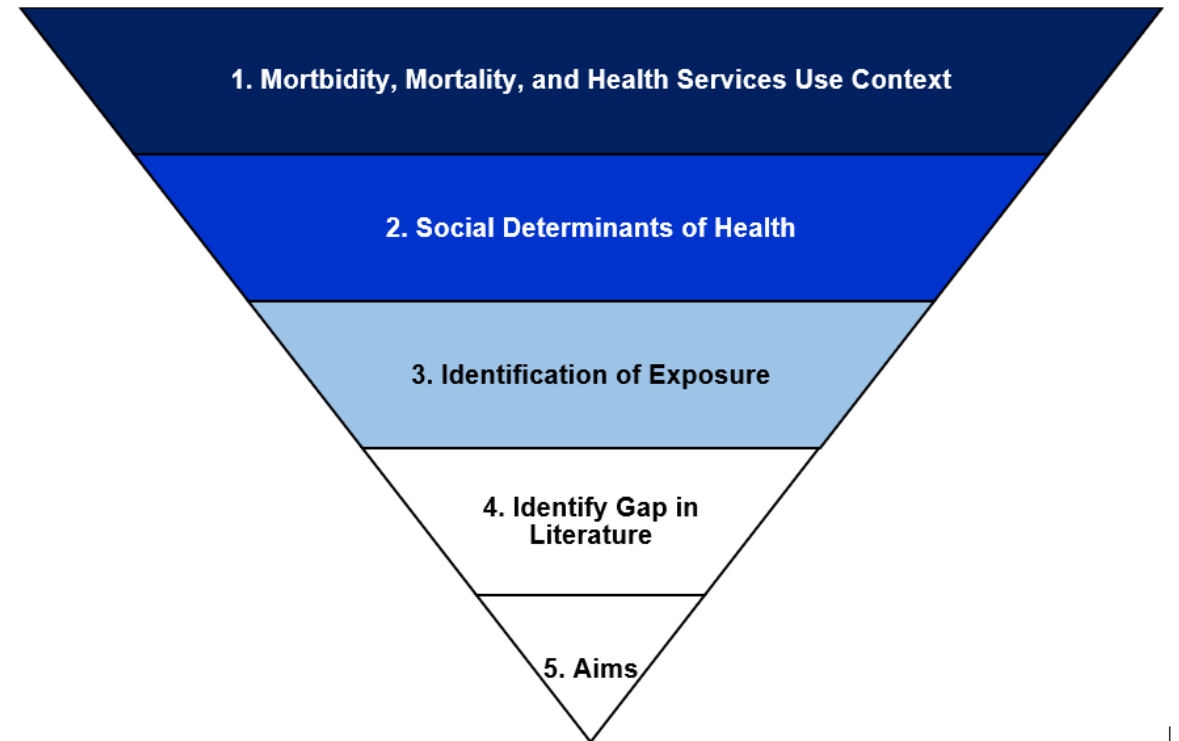
- Focus on social determinants of health
- Narrows down the context of the outcome by including details on the health disparities
- Alzheimer's disease and related dementias (ADRD) as outcome
 - Differences in the prevalence of ADRD among non-Hispanic black individuals compared to non-Hispanic white individuals



11.4.1.b Introduction

Third paragraph

- Focuses on exposure/independent variable
- May be combined with the previous paragraph if exposure is social determinant of health
- “What research has already been conducted on the relationship between the exposure and outcome?”
- Alzheimer’s disease and related dementias (ADRD) as outcome
 - Examine ADRD prevalence differences among foreign-born and US-born racial and ethnic minority groups since previous studies indicate that foreign-born individuals tend to have better health outcomes than tUS-born



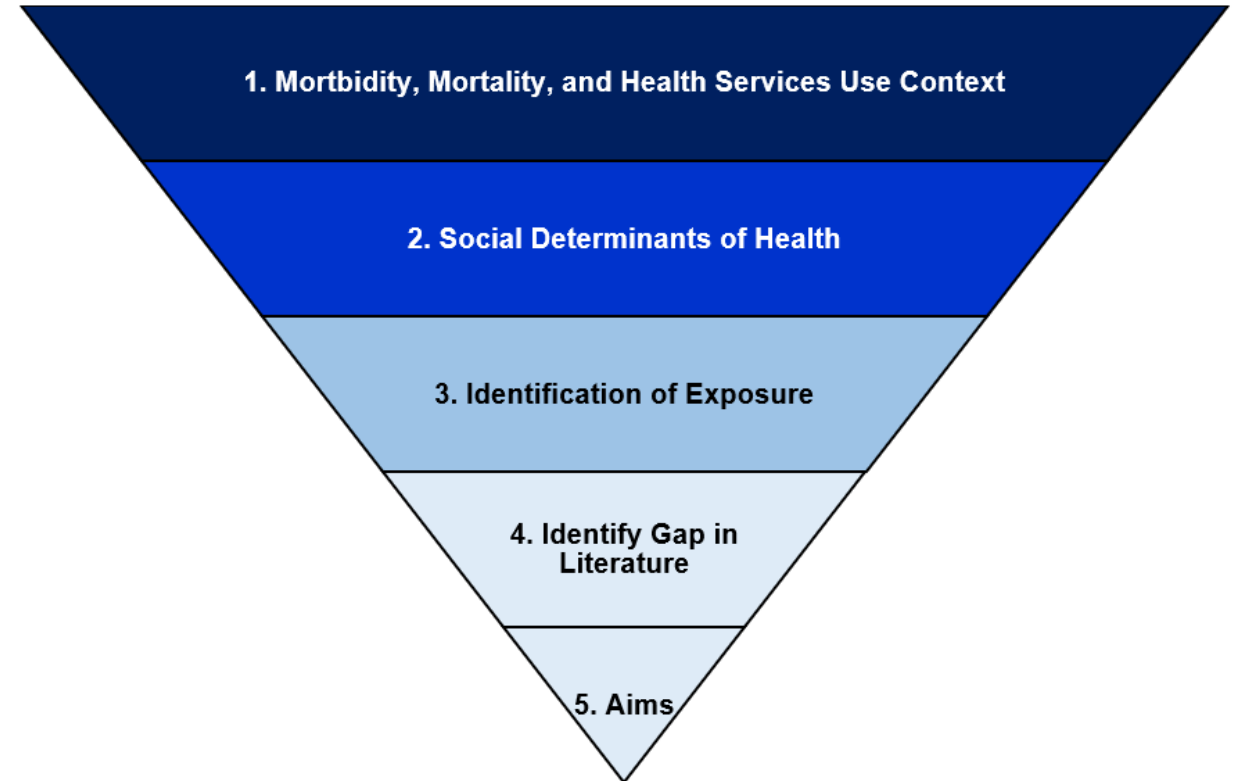
11.4.1.b Introduction

Fourth paragraph

- Identifies the gap in the literature on the relation between the exposure and the outcome

Fifth paragraph

- Outlines specific aims or objectives
- May include research questions or hypotheses depending on the project and journal requirements



11.4.1.c Methods

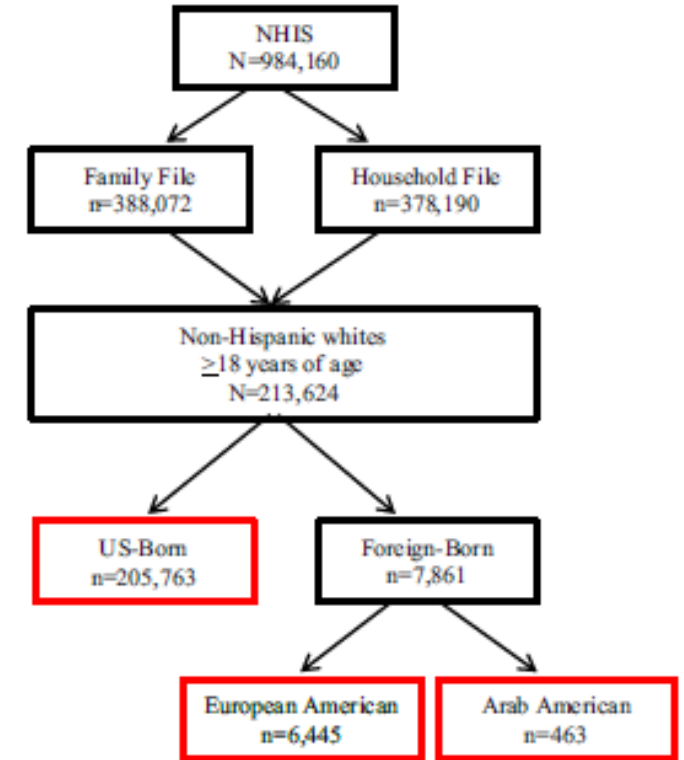
- How you conducted study
- Why you conducted study in particular way
- Provide enough detail for replication
- Subsection examples
 - Data source
 - Participants
 - Variables
 - Statistical analysis
 - Institutional review board (IRB) approval
- Writing tips
 - Use past tense since the methods have already been conducted
 - Write in active “we collected” or passive “the data were collected” voice depending on journal

11.4.1.c Methods *Data Source*

- Specify national health survey used
- Include years or panels of data used
- Include brief details on the history and purpose of the national health survey
- Refer the reader to website and previous studies using similar methods if published previously

11.4.1.c Methods *Participants*

- Included total number of participants who completed the national health survey
- Describe how the sample was limited based on predetermined inclusion and exclusion criteria
- Include total number of unweighted and weighted participants in sample
- Can be represented with a figure



— Analytic Sample

Fig. 1 Flow diagram of the sample, NHIS 2000-2011

<https://doi.org/10.1007/s40615-015-0178-8>

11.4.1.c Methods *Variables*

- Includes details on the questions used to meet study aims
- Potential Subsections
 - Independent variables (exposures or predictors)
 - Dependent variables (disease or outcomes)
 - Covariates (including confounders, mediators, and other explanatory factors)
- Includes ways variable recoded by combining it with other questions or removing missing responses
- Includes references to previous studies that have served as the basis for recoding variables or adjusting for specific covariates during the statistical analysis

11.4.1.c Methods *Statistical Analysis*

- Include details on what analysis were conducted to meet the research aims
 - Basic descriptive statistical procedures, such as frequencies, percentages, means and standard deviations
 - Comparative (or bivariate) statistical procedures, such as t-tests or chi square tests
 - Inferential statistical procedures, such as regression analyses.
 - Weighting, clustering, and primary sampling units
- Cite the analytic guidelines for each specific national health survey
- Cite software used (STATA, SAS, etc.)

11.4.1.c Methods *Ethical Approval*

- Includes statement of “Not Human Subjects Research” or IRB Approval Statement

The screenshot shows the NIH Grants & Funding website. The header includes the NIH logo and the text "GRANTS & FUNDING NIH Central Resource for Grants and Funding Information". A search bar is located in the top right corner. The navigation menu includes links for HOME, ABOUT GRANTS, FUNDING, POLICY & COMPLIANCE (which is highlighted), NEWS & EVENTS, and ABOUT OER. Below the navigation menu, there is a breadcrumb trail: Home » Policy & Compliance » Human Subjects » Decision Tool: Am I Doing Human Subjects Research?.

The main content area is titled "POLICY & COMPLIANCE" and features a sidebar with a "Policy Topics" menu. The "Human Subjects Research" topic is selected and highlighted. The sidebar menu includes the following items: Definition of Human Subjects Research, Pre and Post Award Process, Certificates of Confidentiality, Single IRB Requirements, Policies & Regulations, and Training & Resources.

The main content area is titled "Decision Tool: Am I Doing Human Subjects Research?". Below the title, there is a paragraph explaining that the Office of Extramural Research (OER) has developed a quick decision tool to assist with determining if research involves human subjects. A yellow callout box contains a "NEW Note" stating that the tool uses the 2018 Revised Common Rule requirements and provides a link to OHRP's page.

The page is currently displaying "Question 1" with the instruction: "Please check which best describes your research". There are two radio button options:

- For the purpose of this study, at some point there will be an intervention or interaction with subjects for the collection of biospecimens or data (including health or clinical data, surveys, focus groups or observation of behavior). Or identifiable private information or identifiable biospecimens will be obtained, used, studied, analyzed, or generated for the purpose of this study.
- The study will involve only secondary research using data or biospecimens not collected specifically for this study.

<https://grants.nih.gov/policy/humansubjects/hs-decision.htm>

11.4.1.c Methods *Figures*

- How the study sample was limited based on the inclusion and exclusion criteria
- Present theoretical models
- Trends in key findings

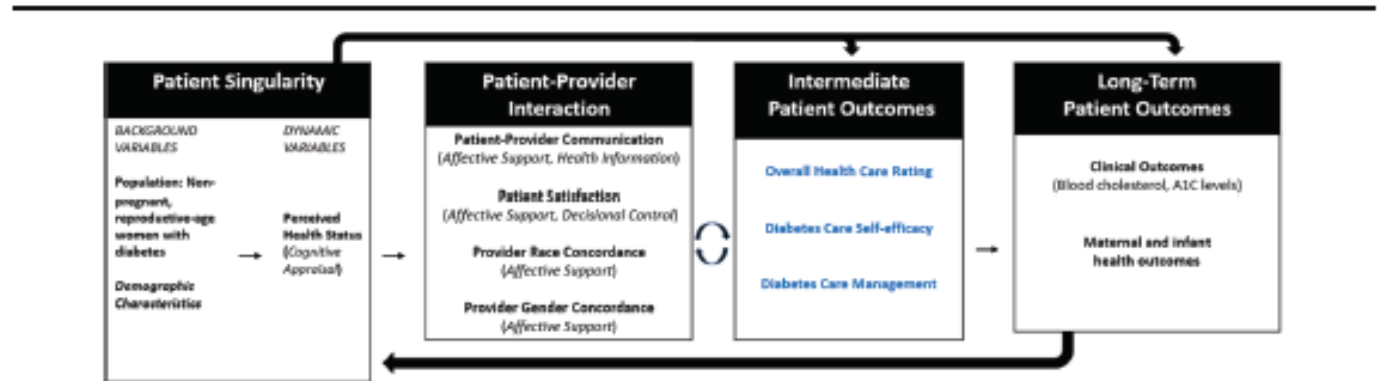


Fig. 1 Modification of the Interaction Model of Client Health Behavior (IMCHB)

<https://doi.org/10.1007/s40615-021-01036-1>

11.4.1.d Results

- “Heart,” or most important section of the paper
- Highlights researchers’ contribution to the scientific literature and overall general knowledge
- Should directly align with objectives and hypotheses presented in the introduction, the methods outlined to meet those objectives in the methods section, and a comparison to other studies in the discussion section
- Should present the main findings but not interpret them in the context of other literature



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11.4.1.d Results



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- Mixture of tables (figures) and text
- Include all findings obtained while conducting the research study
- ≥ 1 paragraph should be included for each table
- Tables should be referred to in the text
- Use headings similar to table titles to direct reader
- Include placeholders (e.g., insert table 1 here)
- ≥ 2 tables with increasing complexity

Table 1: Demographics

Tables 2+: Main analytic results

- Each table should “stand alone” with specific titles and footnotes to describe contents

Table 11.3.a Table shell representing how to present basic sample characteristics

	Unweighted N (%)	Weighted N (%)
Race, Ethnicity and Nativity		
US-Born Non-Hispanic Whites		
Foreign-born Non-Hispanic Whites		
Foreign-born Arab Americans		
Sex		
Male		
Female		

Table 11.3.b Table shell representing ways to present bivariate analyses using sample characteristics

	Flu Vaccine Last 12 months		p-value
	No % (SE)	Yes % (SE)	
Race, Ethnicity and Nativity			
US-Born Non-Hispanic Whites			
Foreign-born Non-Hispanic Whites			
Foreign-born Arab Americans			
Sex			
Male			
Female			

Table 11.3.c Table shell for age- and sex-adjusted prevalence estimates

	US-Born	Foreign-Born	
	Non-Hispanic Whites % (SE)	Non-Hispanic Whites % (SE)	Arab Americans % (SE)
Alzheimer's disease and related dementias (ADRD)			
ADRD with comorbid diabetes			
ADRD with comorbid hypertension			

Table 11.3.d Table shell for logistic regression results

	Model 1 Crude OR (95% CI)	Model 2 Adjusted for demographics OR (95% CI)	Model 3 Fully Adjusted OR (95% CI)
Race, Ethnicity and Nativity			
US-Born Non-Hispanic Whites			
Foreign-born Non-Hispanic Whites			
Foreign-born Arab Americans			

11.4.1.d Results *Sensitivity Analysis*

- Analyses used to determine whether a different model or set of assumptions will yield similar results

Example: Arab versus Middle Eastern or North African Adults

- 4 studies used restricted data from individuals from 15 countries that are geographically located in the Middle East and part of the Arab League of Nations to determine health outcomes
- A sensitivity analysis compares results with a variable that includes individuals born in all countries in the Middle East region, regardless of whether or not they were born in a country that is part of the Arab League
- Sensitivity analyses may be included as supplementary material due to limitations on word count and number of tables/figures allowed to be included with the text

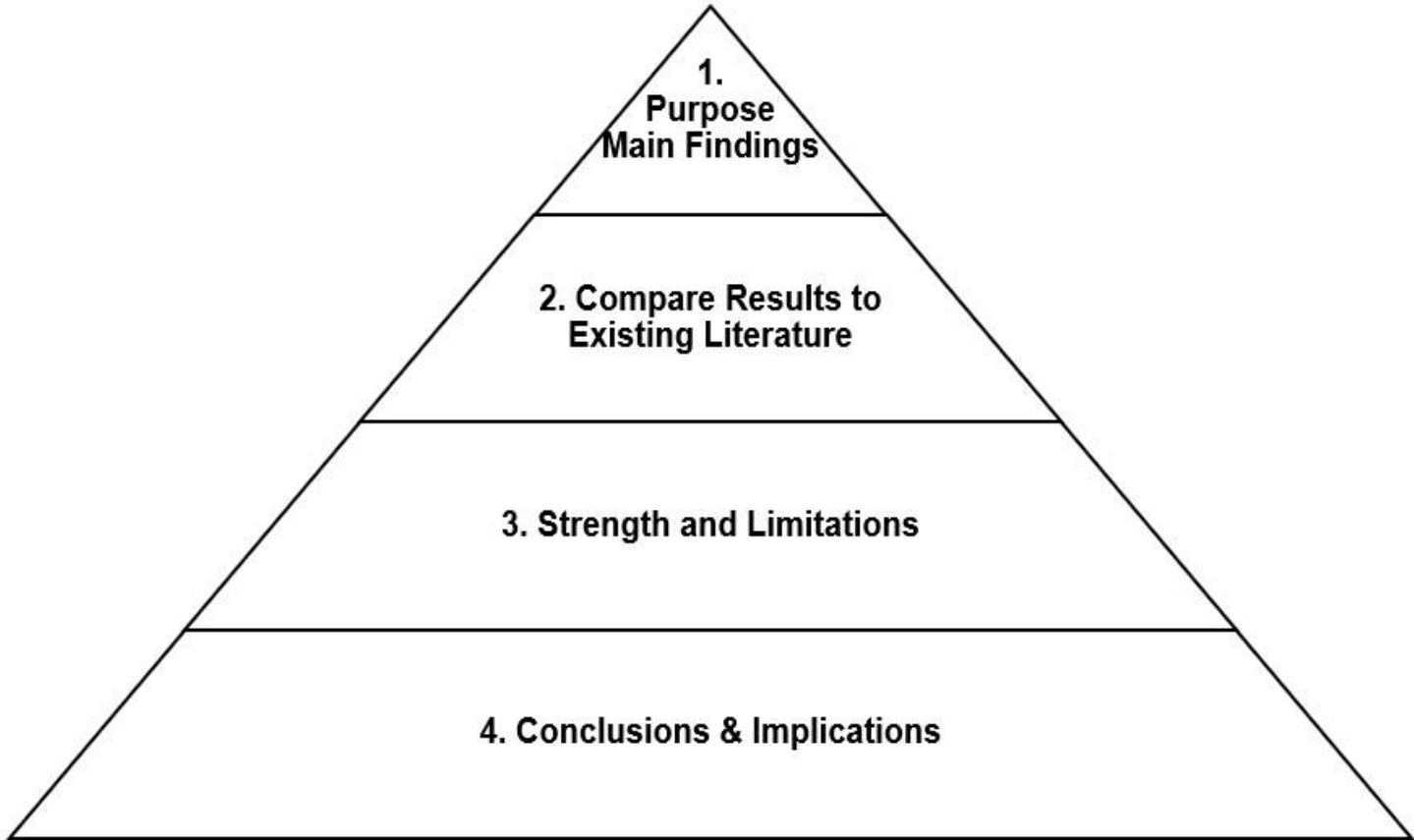
11.4.1.e Discussion

- Purpose is to interpret the findings and provide meaning to the results in the context of the other medical literature
- Should mirror the introduction section as a pyramid or reverse funnel
- Instead of starting off with the broad context and ending with a specific purpose and objectives, the discussion section starts off with specific results and expands to broader context



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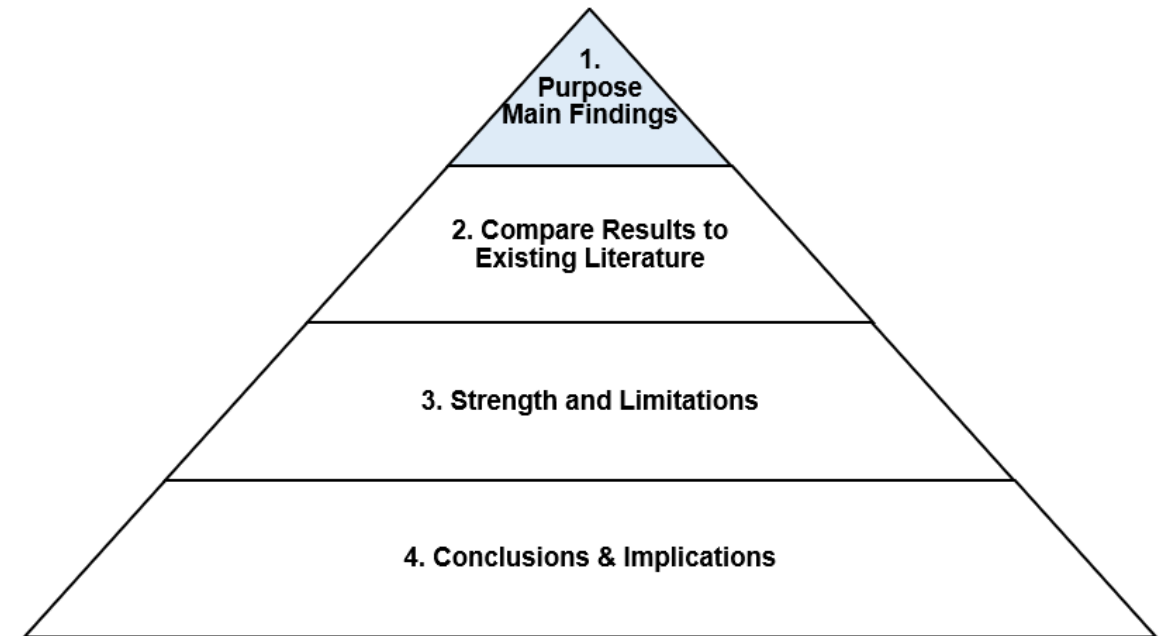
**Figure 11.5:
Overview of
Discussion Section
Pyramid Outline for
Writing Manuscripts
Using National
Health Surveys**



11.4.1.e Discussion

First paragraph

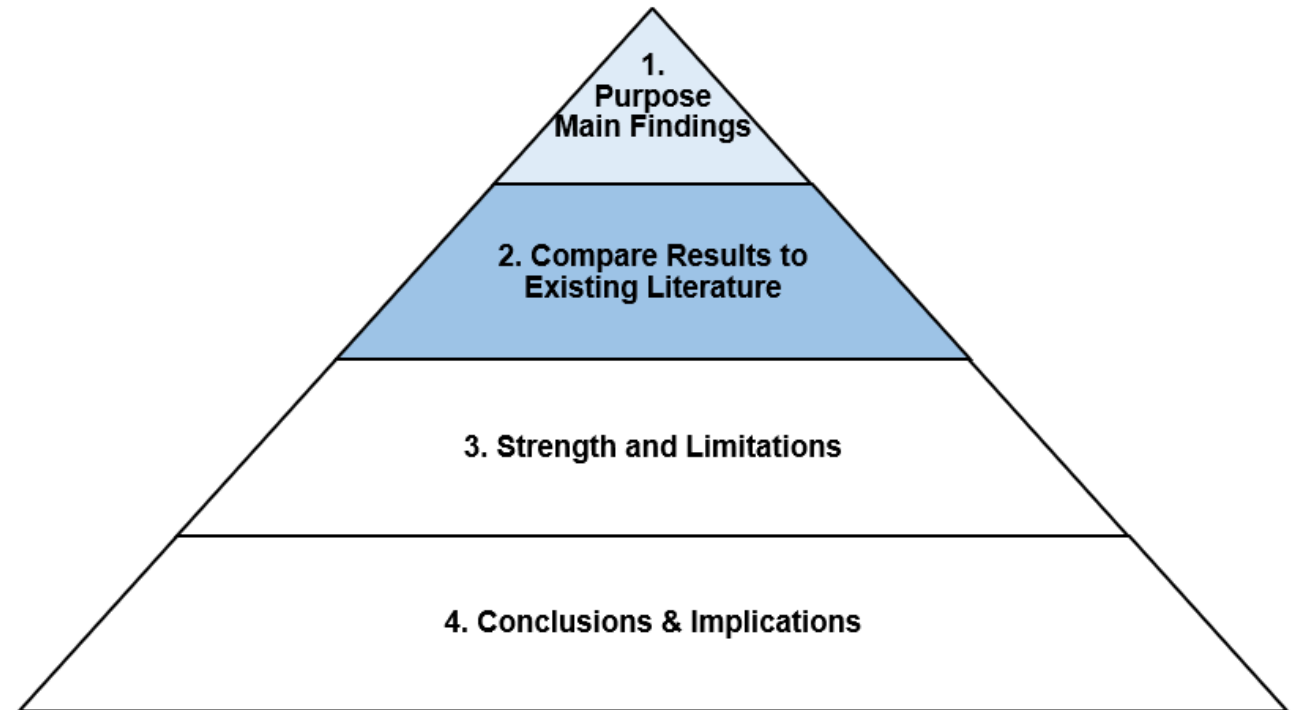
- Restate the purpose of the study
- Briefly summarize the main findings



11.4.1.e Discussion

Second paragraph(s)

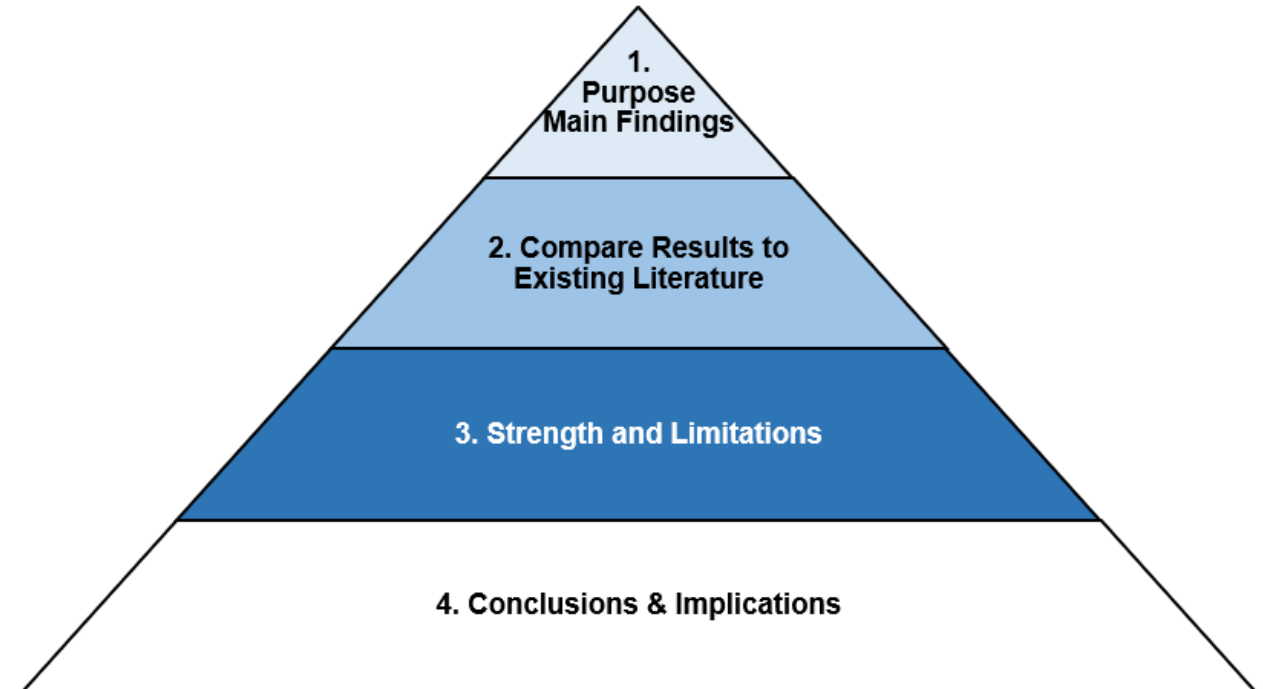
- ≥ 1 paragraph for each of the most relevant findings
- Include references to compare and contrast results with other studies
- Include reasons why the results may be the same or different from other literature



11.4.1.e Discussion

Third paragraph/section

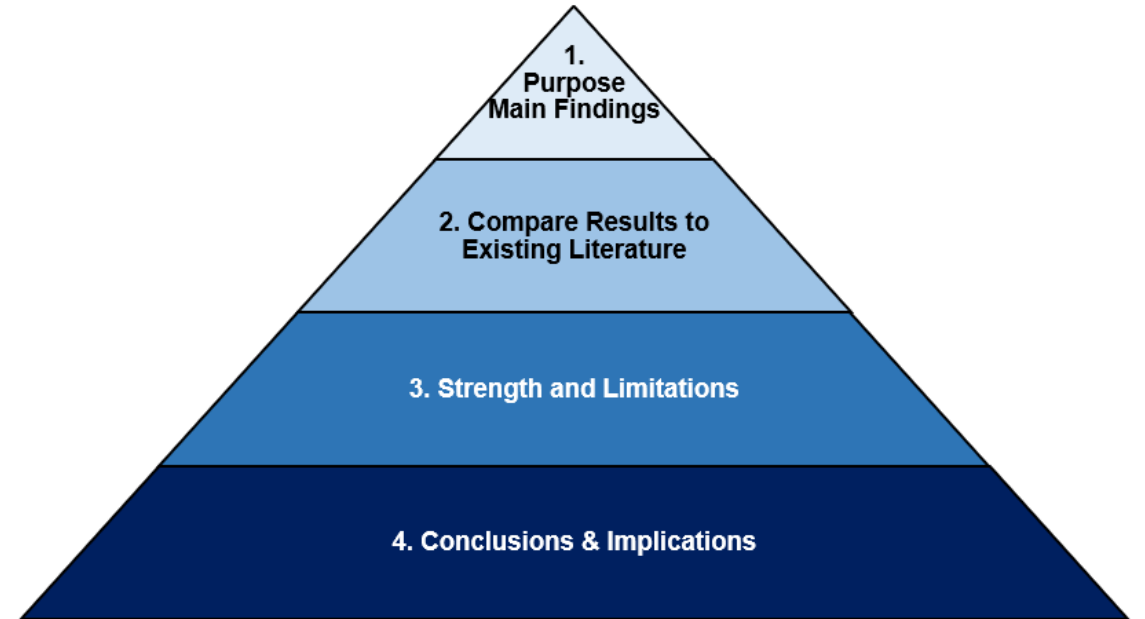
- Strengths
 - Probability-based sample design versus a convenience sample
 - Large sample size
 - Broad content areas
- Limitations
 - Cross-sectional design
 - Information bias with self-reported data collection mode



11.4.1.e Discussion

Fourth paragraph/section

- Conclusions
 - Generalizability
 - Impact the findings may have on interventions and public health policies
- “Take home message” from the research with future directions and recommendations



11.5 Writing Tips and Tricks

- Start with the results section, then write the methods section
 - Create your tables or figures first, then write 1-2 sentences
 - Frame introduction and discussion around the key findings
- Select a similar article to use as a model for writing
- If you wrote a grant proposal or IRB protocol, use the same information to start writing your paper
 - Change future “we will analyze” to past “we analyzed”

11.5 Writing Tips and Tricks

- Confirm authorship with International Committee on Medical Journal Editors (ICJME) guidelines
 - Make sure they are contributing to the manuscript – do not do everything yourself
- Use referencing software like Endnote or Zotero to manage your in-text citations and references at the end of the paper
- When all else fails, hand write your manuscript on a piece of paper – not type it

11.6 Summary

- Chapter 11 provided in-depth overview of disseminating research by presentation and publication
 - Part 1 Presentations
 - Part 2 Manuscripts
- Dissemination is the final step in the research process and is essential when conducting research using national health surveys
- Several examples have been provided to demonstrate different types of presentations created and sections of manuscripts written by the primary author of this textbook
- More examples are available with the training videos and resources on the textbook website, <https://hsrlab.uta.edu/big-data-for-epidemiology/>

11.7 References

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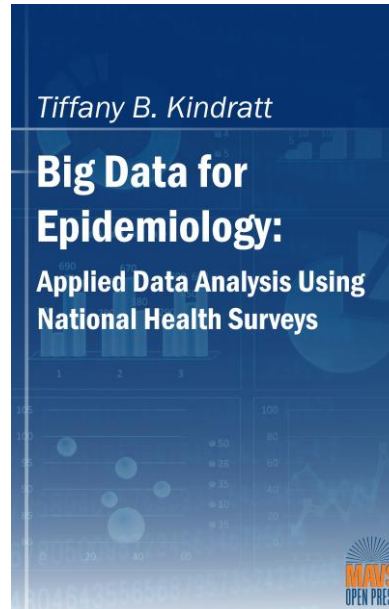
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Big Data for Epidemiology:

Applied Data Analysis using
National Health Surveys

Chapter 11: Dissemination Part 2 Manuscripts



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Education for Students
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Thank you!

Please contact me with questions regarding this
presentation.

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