Scientific Writing for Applied Epidemiologists

Justin B. Moore, PhD, MS

Cerus Consulting, LLC
Wake Forest School of Medicine,
Journal of Public Health Management & Practice

Lloyd F. Novick, MD, MPH

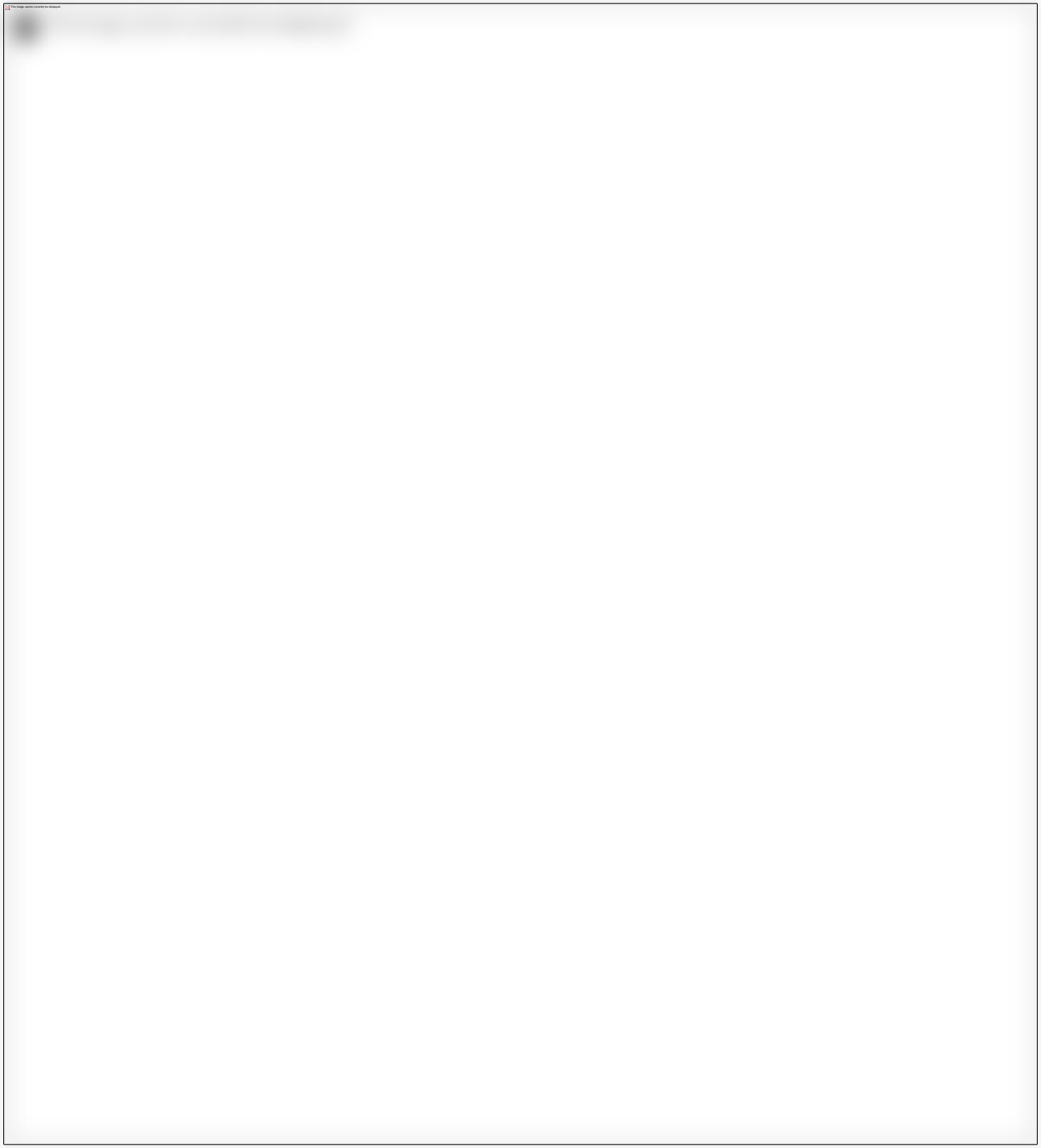
Brody School of Medicine, East Carolina University (Emeritus)
Journal of Public Health Management & Practice

Objectives

- After the webinar, participants will be able to:
  - Identify steps in the scientific writing process.
  - Locate resources for planning, writing, and dissemination scientific articles.
  - Identify mechanisms to support a culture of writing/publishing in a state or local health department.

Introduction

- Communication is vital to an epidemiologist's work.
- Dissemination of applied public health practice occurs through many channels
- The Council of State and Territorial Epidemiologists (CSTE) conducted an assessment of indicators to guide recommendations for how this skill can be improved
  - *Applied Epidemiology Scientific Writing Trends, Needs, and Recommendations, 2014*
- This scientific writing assessment led to the development of the *CSTE Scientific Writing Toolkit for Applied Epidemiologists*



Contents of the CSTE Scientific Writing Toolkit

- Planning for Scientific Writing
- The Process of Scientific Writing
- Submitting the Manuscript to a Scientific Journal
- The Culture of Writing/Publishing
- Gaps in Existing Writing Resources
- Online Resources for Scientific Writing

Practitioner Resistance to Publishing a Scientific Article

- Too formidable an undertaking
- Requires writing skills beyond their capacity
- Exceeds time available in their schedules
- Something they have never or rarely done
- Nobody is really asking for this (ie, It's not part of their job description)
- May be lack of organizational support or clear explicit agency process

What is Publishable?

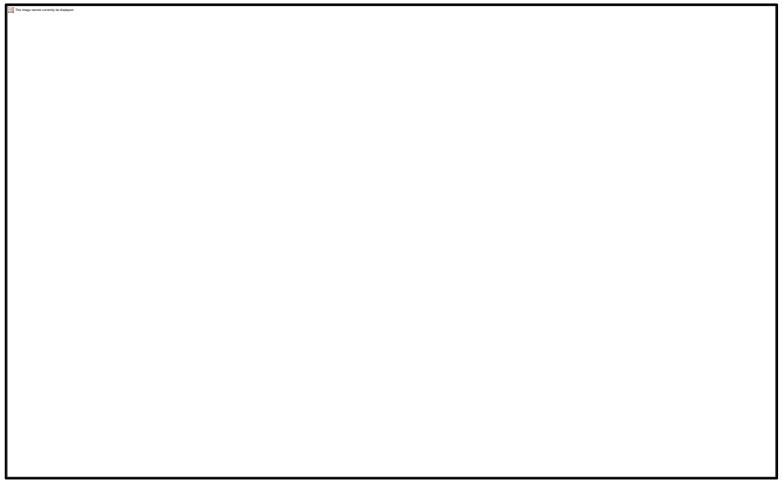
- Will publishing on this topic add to general knowledge in the field and be of use to my peer group and others?
- What is the benefit of a publication in this area?
- Will it document a public health problem?
- Will it add to the further understanding of this public health issue?
- Will the intervention described possibly add to public health evidence for future programs?

Planning for Scientific Writing

- Types of scientific writing
  - Writing for public consumption
  - Writing for policy makers
  - Writing for the scientific community
- Human subjects protections
- Understanding appropriate scientific conduct
- Data procurement
- Composing the writing team
- Determining authorship
- Selecting a target journal
- Understanding journal metrics

Types of Scientific Writing

- Examples of materials for public consumption:
  - Brochures
  - Fact sheets
  - Press releases
  - Reports
  - Social media
  - Websites
- Examples of materials for policy makers:
  - Policy briefs
  - Opinion
  - Press releases
  - Memorandum



Writing for the Scientific Community

- Examples of scientific articles:
  - Case report
  - Research article
    - Briefs
  - Rapid review
  - Narrative review/Systematic review/Meta-Analysis
  - Government Serial Publications

Human Subjects Protections

- Before the data procurement, analysis, or writing process begins, human subjects protections should be considered
- Novice writers can mistakenly determine that institutional review board (IRB) approval is unnecessary (eg, their work isn't research)
- Most reputable journals require explicit reporting of IRB approval or official notice of 'exemption'
- Official partnership with an academic institution or a commercial IRB may be necessary

Understanding Appropriate Scientific Conduct

- Collaborative Institutional Training Initiative (CITI)
  - Training in the responsible conduct of research
- Data security
- Plagiarism

Data Procurement

- Many applied epidemiologists have access to large datasets which they can analyze to produce scholarly works
- External datasets are often useful to answer research questions relevant to public health policy or practice
- Identifying resources
- Data use agreements

Composing the Writing Team

- Composing the scientific writing team should start with a process familiar to many applied epidemiologists, the needs assessment
- Few authors bring all the skills they need to the table, as writing projects can require diverse skills. For example;
  - development of a conceptual model
  - data cleaning and analyses
  - literature review and synthesis of the literature
  - putting the results in context (ie, the discussion)

Determining Authorship

- The senior author oversees the writing process
- The senior author is commonly the last author
- There are a number of guides to help the senior author determine authorship.
  - eg, International Committee of Medical Journal Editors.

Selecting a Target Journal

- Selecting a journal for submission can be the most important factor that predicts how long it will take to go from a manuscript to a published article or readership of the published article
- Measures of prestige (formal or informal) shouldn't deter an author from considering a journal as an outlet
- A manuscript that is a good fit for a prestigious journal may get a warm reception by the editors
- A manuscript that is a poor fit for a journal may get rejected by a less highly esteemed journal

Understanding Journal Metrics

- There are no universally accepted metrics to determine the importance of a journal or value of a published article
- Traditional and alternative metrics should be considered when choosing a journal
- Traditional journal metrics:
  - Impact per Publication (IPP)
  - Source Normalized Impact per Paper (SNIP)
  - SCImago Journal Rank (SJR)
  - Journal Impact Factor
  - Five-year Impact Factor
  - Immediacy Index:
  - Cited Half-Life
  - Eigenfactor and Article Influence
- Alernative metrics:
  - Altmetric
  - ImpactStory
  - Publish or Perish
  - PlumX
  - ReaderMeter

The Process of Scientific Writing

"Writing in Boxes"

Getting Started

- “Writing in Boxes” is a technique that jump-starts a manuscript
- Used successfully in school of public health writing courses
- Drafting an entire article is indeed a formidable undertaking
- Article can be divided into a series of elements or boxes
- Construction of the article is accomplished by;
  - completing the boxes (first in concise format and later expanded), and
  - linking them

Getting Started

- Establish a core group of 3-4 authors
- At the start, core group discusses the topic
- A single topic sentence expressing the essence of the article is constructed
- The aim, objective, and/or hypothesis of the article (eg, outbreak investigation, surveillance issue, or program intervention)
- A next step at one of the initial meetings is to draft a summary for the article, not to exceed 300 words. In this case, one can also refer to the abstract as a summary, but it is important that it can be expressed in one page, not to exceed 300 words

Sewing the Boxes Together

- When results or findings are available, the boxes are sewn together in an integrated document
- A discussion is added that summarizes the findings and compares them to the introduction

Initial Meetings

- Homework assignments are handed out to the core authors
- Each core author is assigned one of the following boxes to work on: introduction, methods, or results
- Each of the core authors works on drafting a concise version, not to exceed 300 words, and brings his or her section
- A clear timeline (with flexibility) is developed and a commitment to meeting deadlines or communicating with other authors when not possible is established
- The order of authors for the article is decided at this early stage

Writing the Title and Abstract

- In selecting a title, use plain English, terms that are likely to be used by colleagues searching for articles
- Concisely express the essence of the paper
- Use provocative and enticing headings
- But do not over promise, employ jargon, or be too cute
- The author guidelines will indicate how your abstract is to be structured or unstructured

Introduction

- State the question
- Establish the importance of the study
- Begin with a topic sentence
- Include a brief summary of the issue
- Provide a concise review of the literature
- Clarify what will your article add

Methods

- How you address the study question
- Who, what, when, and where?
- Recipe that others can repeat
- Data sources
- Outcomes to be measured
- Describe analysis
- Statistical test
- Study design
- Describe the intervention
- Ethical approval

Results

- Report findings
- Detail individuals included and excluded
- Include statistical significance
- Consider supplemental digital content

Discussion

- The point or “so what” of the study
- Summary
- Place your findings in the context of previous literature
- Don’t over interpret the findings or develop delusions of grandeur
- Implications
- Limitations
- Recommendations

Fostering a Publication Culture in a Public Health Agency

- Most important factor in encouraging publication is leadership in the organization
- Mentorship but also the leaders engaging in their own writing activity
- Realization that the daily activities of practitioners can be fertile grounds for publication
- Writing up events actually improves performance and skill set
- Collegial efforts involving small groups of authors
- Encouragement of internal presentations and at scientific meetings
- Writing assistance through workshops or editorial staff
- Access to the peer-reviewed literature
- Academic relationships—appointments or teaching health departments

Thank you.

Questions?

Acknowledgements

- Jessica Arrazola of the Council of State and Territorial Epidemiologists
- Theresa M. Oniffrey of Cerus Consulting, LLC
- Sheryl Monks of the Journal of Public Health Management & Practice
- Key informants:
  - Kris Alpi, Leslie Beitsch, Guthrie Birkhead, Barbara Folb, Marci Layton, Patricia MacCubbin, John Marr, Kerry Sewell, Robert Shapiro, Benedict Truman, and Gretchen Van Wye.
- CSTE Scientific Writing Workgroup:
  - Sharon Greene, Mandy Stahre, and Laura Tolmedi. is the lead contributing CSTE national office staff member.
- The CSTE Executive Board
- Our partners at the Centers for Disease Control and Prevention

- Disclosure:
  - This work is supported in part by Cooperative Agreement Number 5U38HM000414-03 awarded to the Council of State and Territorial Epidemiologists from the Centers for Disease Control and Prevention (CDC). The contents of the report are solely the responsibility of the authors and do not necessarily represent the official views of CDC.