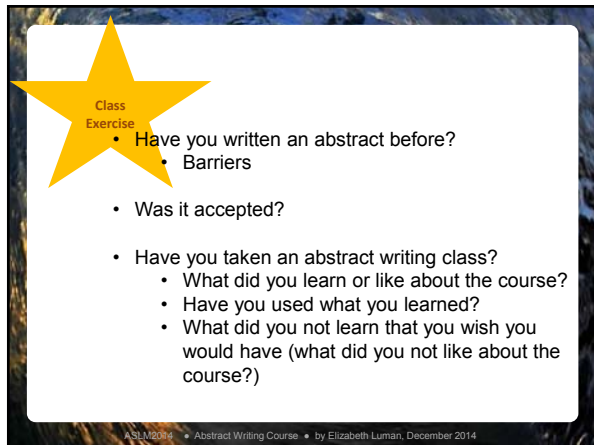




**Welcome to
Abstract Writing!**
Beth Luman, PhD
*US Centers for Disease Control and Prevention
African Journal of Laboratory Medicine*

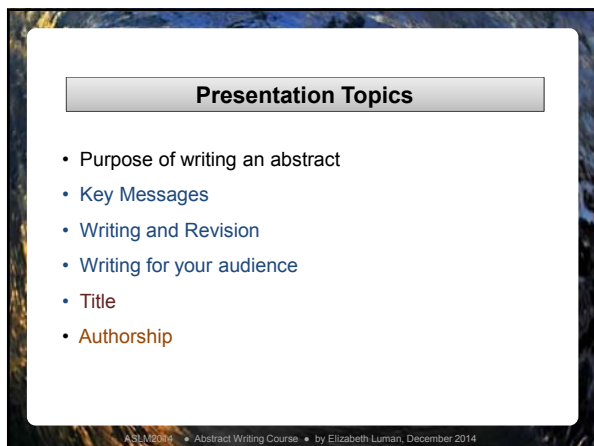
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Class Exercise

- Have you written an abstract before?
 - Barriers
- Was it accepted?
- Have you taken an abstract writing class?
 - What did you learn or like about the course?
 - Have you used what you learned?
 - What did you not learn that you wish you would have (what did you not like about the course?)

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Presentation Topics

- Purpose of writing an abstract
- Key Messages
- Writing and Revision
- Writing for your audience
- Title
- Authorship

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Goals

- Identify a key message and clearly state why the study was important
- Write clearly, identify the appropriate sections of an abstract
- Develop an abstract and title that succinctly communicate the key message of the paper within the word count limitations
- Understand authorship requirements

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a bacall

"Very good. Now ten more reps...and a one, and a two, and..."

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Why present?

- Disseminate research findings
 - Advance science
 - Change actions
 - Increase impact of your research
- Career development
 - Register discovery – assert ownership
 - Establish reputation
 - Attract collaboration and funding

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What to submit?

- New and original *results*
- New and original *methods*
- Studies that *advance knowledge* and understanding in a scientific field
- Studies that have *impact*
- Reviews or *summaries* of a subject

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What **NOT to submit?**

- Reports of no scientific merit
- Outdated work
- Abstract from of previously published work
- Abstract previously presented
- Incorrect data
- Studies of limited interest for the expected audience

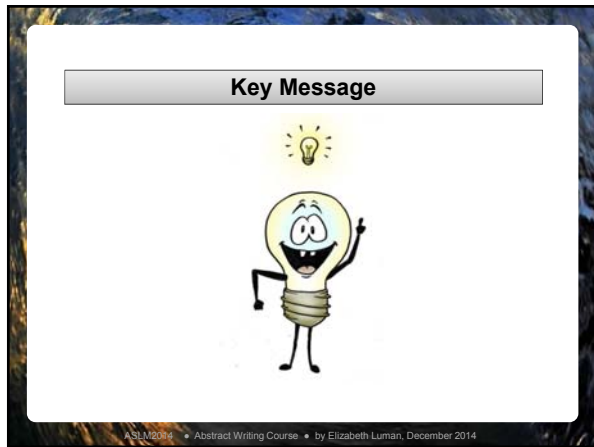
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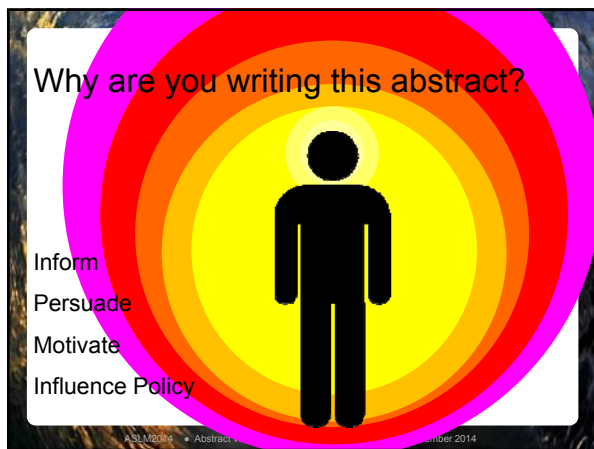
What makes a good abstract?

- Clear and exciting scientific message
- Topic appropriate for audience
- Logical flow
- Valid methodology, appropriate conclusions
- Highlight key message
- Style and language that transmits message clearly
- Follow the guidelines

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Developing the Message

To develop your message, ask:

- What have I found that is **interesting**?
- What have I found that is **new**?
- What have I found that could have an **impact** on public health or clinical medicine?
- Who is my **audience**?

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Your Main Message

- Limit your abstract to one main message
- Be focused, clear, and concise
- Formulate the argument you're trying to convey

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"Elevator"

- If you got into an elevator and they asked what you could describe your weeks in seconds that you ride together?
- What is the **one thing** you want your audience to remember?
- Could someone understand your research if they were an expert in the subject matter?
- Would they wish they had taken a different elevator?



15 1 ELEVATOR, 9 1 BOMB, N

Examples

- In Ethiopia, diarrheal disease kills more children aged <5 years than malaria (12 words)
- Vitamin A deficiency is common despite widespread distribution of free capsules (11 words)
- Mentored laboratories improved more than non-mentored laboratories in our SLMTA program (11 words)

*Be **BRIEF** but **UNAMBIGUOUS!***

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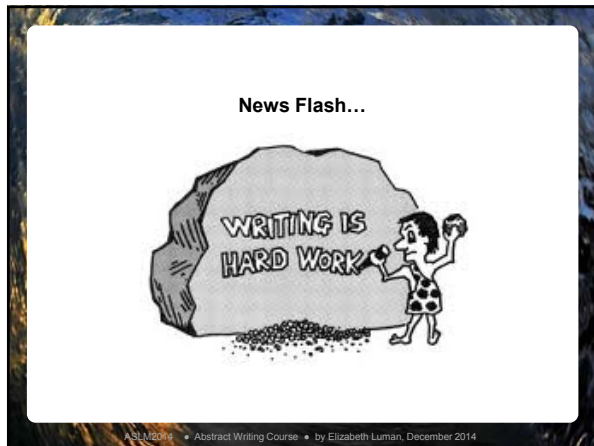
Tell Your Story

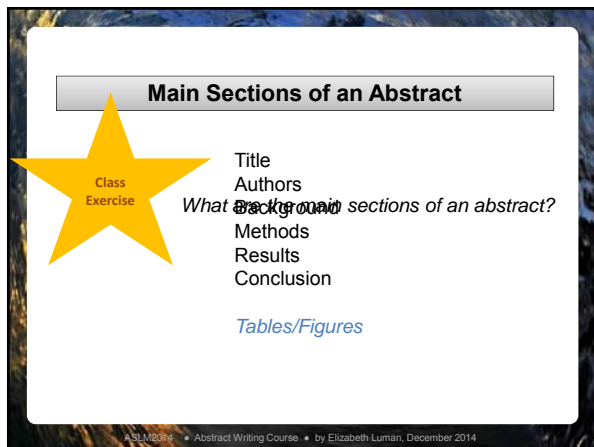
- Decide on your message
- Organize your thoughts: what background is needed to set the stage, how can you best convey your message and findings
- Be clear, concise, and direct; gear your abstract to your audience
- Stay on topic

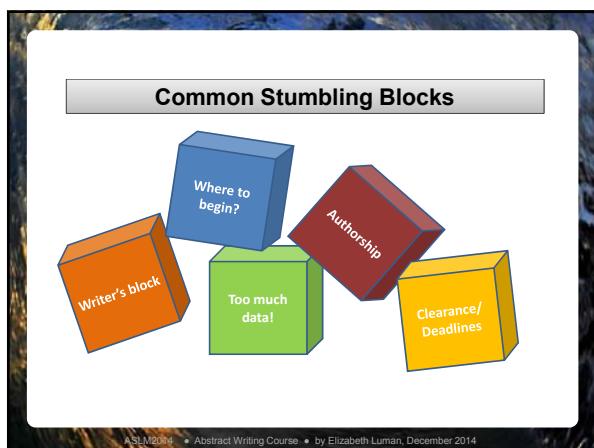
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**Organization, General Tips
And Review of the
Literature**


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Common Stumbling Blocks



- Outline
- Work from study protocol
- Very rough draft
 - Bullet points
 - Key words
- Discuss with co-authors

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Common Stumbling Blocks



- Decide on key message
- Which results are necessary to get to your message
- Write out all results, then cut
- Divide into multiple abstracts?

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Common Stumbling Blocks



- Results
- Methods
- Background
- Conclusions
- Title

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Common Stumbling Blocks

- Set aside protected time
- Plan time for clearance
- Submit early

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Common Stumbling Blocks

- Decide EARLY!
- Communication

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Helpful Tips for Writing an Abstract

1 **NOBODY CARES** until YOU make them care

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Example: Afr J Lab Med. Vervet Monkey Paper. M Waema et al (in press)

Objectives: This study assessed the sequential clinical, parasitological and haematological changes in vervet monkeys infected with *T. b. brucei*.

Methods: Three vervet monkeys were infected with a 10⁴ inoculum of *T. b. brucei* (isolate GUTat 1). Late-stage disease was induced by subcurative treatment with diminazene aceturate 28 days post-infection. The animals were treated curatively with melarsoprol upon relapse. Parasitaemia and clinical signs were monitored daily and, at weekly intervals, the monkeys' blood and cerebrospinal fluid (CSF) were sampled for haematology and parasitosis assessments, respectively.

Results: The first-peak parasitaemia was observed between seven and nine days post-infection. Clinical signs associated with the disease included fever, dullness, pallor of mucous membranes, lymphadenopathy, splenomegaly and oedema. Late-stage signs included stiffness of joints and lethargy. The monkeys developed a disease associated with microcytic hypochromic anaemia. There was an initial decline, followed by an increase, in total white blood cell counts from early- to late-stage disease. Trypanosomes were detected in the CSF and there was a significant increase in white cell counts in the CSF during late-stage disease.

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Example: Afr J Lab Med. Vervet Monkey Paper. M Waema et al (in press)

Background: There are three subspecies of *Trypanosoma brucei*: *T. b. gambiense*, *T. b. rhodesiense* and *T. b. brucei*. The first two are infectious to humans, whilst *T. b. brucei* is not. Identifying an animal model of *T. b. brucei* that mimics human African trypanosomiasis (HAT) would enable researchers to study HAT without subjecting themselves to undue risks such as accidental infection.

Objectives, Methods, Results

Conclusion: The *T. b. brucei* vervet monkey model can be used for studying HAT without putting laboratory technicians and researchers at high risk of accidental infection.

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Helpful Tips for Writing an Abstract


2

AUA – Avoid Unnecessary Acronyms

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Helpful Tips for Writing an Abstract

3 A DRAFT...



A cartoon showing a man in a green suit and hat drinking a beer. He says, "GAH! THIS BEER IS TERRIBLE! ITS TONE-DEAF AND MPLAUSBLE!". A bartender replies, "WELL, IT WAS JUST A FIRST DRAFT." The cartoon is signed "GARDONSTOCK" and "© 2014".

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Helpful Tips for Writing an Abstract

4 SIMPLIFY...

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Helpful Tips for Writing an Abstract

"An abstract should be like a mini skirt: long enough to cover everything, but short enough to keep it interesting."

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Helpful Tips for Writing an Abstract

5

Nothing lasts forever

DETAILS MATTER --
Double-check results
Spelling and gramer,
.....except for bad grammar.

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Helpful Tips for Writing an Abstract

6

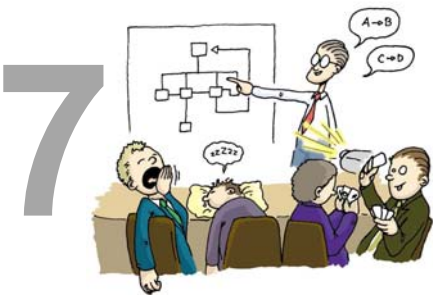
REMAIN OBJECTIVE
Avoid loaded terms
"Groundbreaking"
"Interesting"

DON'T OVERSTATE YOUR RESULTS
"This study proves that..."
"All countries should implement..."

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Leave Them With Something... Memorable

7



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Additional Considerations

- (Usually) avoid policy implications
 - Criticisms of other agencies, people
 - Calls for changes in laws, regulations, administration
 - Directing an agency or organization to take action
 - Positions on controversial issues without evidence

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Additional Considerations

- Avoid personal opinions
 - Unsubstantiated value judgments
 - Personal preferences for one product or approach over others
 - Attempt to interpret opinions or positions of other groups

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Additional Considerations

- Avoid self-serving statements
 - Calls for increased funding of a (or your) program
 - Commentary on budget cuts
 - Inappropriate promotion of a (or your) program
- Avoid conflicts of interest
 - Real and perceived conflicts of interest
 - Endorsement of specific products or approaches
 - Collaborations with private sector partners with vested interest

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A good study should...

Do it **FIRST**  Do it **BETTER**



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Literature Review

- Not included in an abstract, but must be done so you can formulate your Key Message!
- Collect background to the research question
- Familiarize yourself with the body of knowledge and establish your credibility – you are expected to be an expert on the subject
- Learn from others – build on what others have done and stimulate new ideas
- Identify gaps in knowledge

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Focus of Literature Review

- Directly related research topic
- Synthesize results noting what is known and not known in the topic area
- Identify areas of controversy in the literature
- Look at suggested further research questions

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Clear Writing Tips

- Don't use scientific terms to define a scientific term
- Establish an atmosphere that is intellectually non-threatening
 - Accessible title
 - Not condescending
 - Don't use jargon or unnecessary acronyms
- Break up a complex idea into its contributing parts

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Sleeping sickness has major health and economic consequences in Africa

Development of diagnostics and new drugs relies on animal models which mimic human disease

Laboratory personnel are at risk when animal models of a dangerous human pathogen are studied

Another form of the parasite is unable to infect humans, but it can infect monkeys

If this safer form mimics human sleeping sickness in monkeys, it might be used as a safer alternative to studying animal models that use the human pathogen

Example: Afr J Lab Med. Vervet Monkey Paper. M Waema et al (in press)

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Clear Writing Tips

- Express the crucial action as a verb, not as a noun (nominalization)
- The data are confirmation of the theory
- The data confirm the theory
- Demonstration of progress made by laboratories is done through improvement project data.
- Laboratories demonstrate their progress through improvement project data.
- Researchers conducted an investigation into the epidemic.
- Researchers investigated the epidemic.

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Clear Writing Tips

- "The" is often not needed
 - **The** participants and their organizations also receive performance reports.
 - **The** results from this study suggest that...
- Combine sentences when possible:
 - Quality and integrity of the program relies heavily on local trainers. Because of this, it is critical that they are competent and well-qualified.
 - Because quality and integrity of the program relies heavily on local trainers, it is critical that they are competent and well-qualified.

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Clear Writing Tips

- Data are... (plural)
- Laboratories (not labs)
- Define acronyms on first use
- Style issues: be consistent
 - One, two, three... vs. 1, 2, 3...
 - X, Y, and Z vs. X, Y and Z
(trivia – called an Oxford comma or sequential comma)
 - British vs. American English
(program vs. programme)
 - As long as you are consistent you're probably fine

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Clear Writing Tips

- Methods and Results should be written in past tense.
 - Three monkeys were infected intravenously with 1 mL of the suspension ... (METHODS)
 - All the infected animals developed acute symptoms characteristic of Rhodesian HAT... (RESULTS)
- Introduction and Discussion in past, present, and/or future tense, depending on the context.
 - *T. b. rhodesiense* is found in eastern and southern Africa and causes an acute infection. (INTRODUCTION)
 - This animal model may enable researchers and laboratory technicians to study HAT without the high risk of accidental infection. (DISCUSSION)

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Clear Writing Tips

- Usually avoid direct quotes. Exception – if someone really **really** famous said it.
- You can't use words directly from someone else's abstract or paper

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Purpose of Editing/Revising

- To communicate clearly to the reader
 - Clarity
 - Ease of reading
- To instill confidence in your work
 - Professionalism
 - Establish credibility
 - Sloppy writing → Sloppy work

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Macro **Paragraph** **Sentence**

- Macro**
 - Clear Statement of Purpose
 - Expected Information in Correct Sections
 - Coherent Argument that Accomplishes Purpose
- Paragraph**
 - Each Section has Purpose
 - Analysis/Discussion of Evidence
 - Flow
- Sentence**
 - Mechanics (Grammar, Punctuation)
 - Style, Word Choice
 - Accuracy

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Sentence Level

- Grammar and punctuation
 - Watch out for extra or missing spaces
 - Subject/verb agreement
 - Parallel construction
- Style – sentences should flow nicely

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Sentence Level

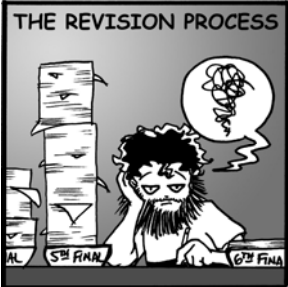
- Circumvent the utilization of terminological specifications which possess the capacity to result in necessitating undue hardship on the consumer of said document

Don't use words that the reader will need to look up or sentences that are so complicated you need to diagram them to decipher what they mean!

Tip: The Thesaurus isn't always your friend.

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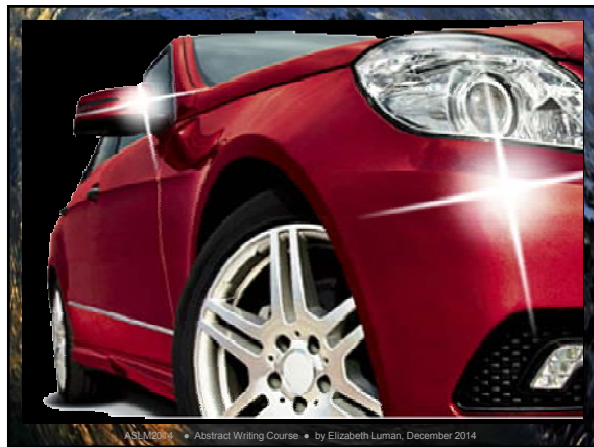
Finally...

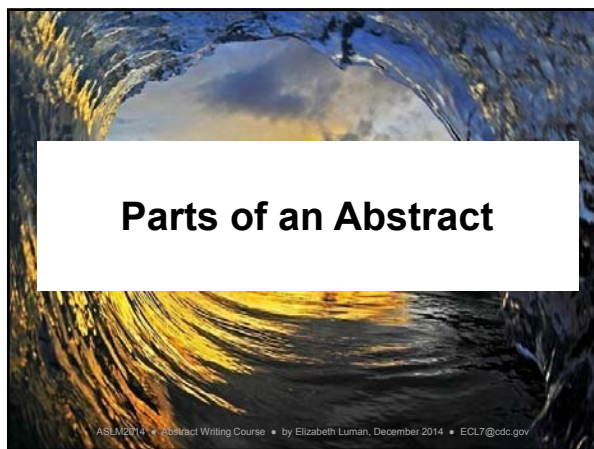


Revise
and revise
and revise some more!

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Results Section

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- ## Results Section
- Objectively present your key findings
 - Without interpretation
 - In a logical sequence
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Purpose of Results Section

| DO... | DON'T... |
|---|--|
| <ul style="list-style-type: none">• Describe the results that are <i>relevant</i> to the study problem• Summarize findings logically answering the study questions• Present the results | <ul style="list-style-type: none">• Describe all results• Discuss the data in great detail• Comment on results |

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Purpose cont.

- **This is not** a place to present **all** of the data that you have collected
- **This is not** a place to present **all** of the results of all of your analyses
- Your aim is to present enough information to report on your main message

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Things to Consider

- What am I trying to say with my data?
- What information is necessary to support my message? NO FLUFF!
- Have I been consistent, concise, and clear with all supplemental material?

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Rules to Remember...

- Present your data objectively
 - Don't use words like "interestingly"
- Use past tense
 - These are the results that you *found*
- Always include measurement units
 - Place after last in a series of numbers
 - E.g., "no differences were observed after 2, 4, 6, or 8 min. of incubation"

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Rules to Remember...

- Differences, directionality, magnitude
 - Don't just say that groups A and B were different
 - How are they different?
 - Report the direction and the magnitude
 - Example:
 - The weight of the puppies in group A was statistically significantly different from that of the puppies in group B.
 - Group A puppies were 23% larger than group B puppies (2.3 pounds vs. 1.8 pounds, $p=0.03$; Fig. 1).

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Methods Section

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Methods Section

- To allow others to **replicate** what you did
 - To test it
 - To do further research
- To allow others to **evaluate** what you did
 - To determine whether the conclusions seem valid
 - To determine whether the findings seem applicable to other situations

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Rules

- Describe what you **did**, not what you **found**
- Respect chronology
- Describe unusual or original methods in detail; otherwise cite references and describe briefly
- Avoid use of first person in this section. Use past tense throughout (the work was conducted in the past).
- Double-check against results to be sure you have included necessary information

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Statistical Analysis

- Describe as needed...
 - programs used
 - statistical tests
 - sample size calculations
 - data transformations or other numerical techniques
 - measures of variability (SD, 95% CI's, etc.),
 - how statistical significance was defined (α)
- Did you use any special methods? Have you provided sufficient information and a justification?
- Is your analysis correct? Does it accurately support your message?

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Example

Laboratory Procedures

• "The petri dish was placed on the turntable and was then raised slightly. An inoculating loop was used to spread the culture to the agar surface. The turntable was rotated 90 degrees by hand. The loop was moved lightly back and forth across the agar to spread the culture. The bacteria were then incubated at 37 C for 24 hr."

Too Much Detail

• "Each plate was placed on a turntable and streaked at opposing angles with fresh overnight *E. coli* culture using an inoculating loop. The bacteria were then incubated at 37 C for 24 hr."

Good

• "Each plate was streaked with fresh overnight *E. coli* culture and incubated at 37 C for 24 hr."

Best if audience familiar

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Background Section

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Purpose of Background

- To convince the reader that your study will yield knowledge that is **INTERESTING, NEW** and **USEFUL**
- To provide information needed to tell your story
- To summarize the current understanding of the problem
- To identify the question(s) the study will address
- Move from what is **known** to what you are **adding** with your study

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Study Problem

Identify a gap in knowledge

- Provide key background – include the scope, nature, magnitude of knowledge gap
- Clarify how filling this gap will be useful

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Study Purpose

Present your approach to filling the gap

- Clarify how your approach is *new*
- Emphasize that your approach addresses the limitations of previous studies in a compelling way
- Make it interesting

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Ask Yourself...

- What is the key problem that this study seeks to address?
- Do you state it clearly and with support?
- Does the statement provoke all the right questions in the reader's mind?
- Which is the most important question provoked by the problem?

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Structure

Tips:

- Don't start too broad or too obvious
 - HIV is a leading cause of death globally
 - Immunization is one of the top 10 public health achievements of the 20th century
- Don't report an entire lit review
- Don't provoke questions that you don't intend to answer
- Don't forget to tell what you are going to do

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Conclusion Section

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Purpose of Conclusion Section

- Interpret or evaluate results in the light of existing knowledge
- Highlight the main implications of your findings; indicate where further work is necessary
- Summarize your main conclusions and recommendations

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Tips...

- Go back to your introduction
 - What questions did you pose?
 - Hypothesis?
 - How has your study moved us forward from where you left us in the introduction?
- Writing style:
 - Use active voice whenever possible
 - Be concise – avoid wordy or vacuous phrases
 - Don't use first person too much

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Important

State implications

- For public health
- For surveillance
- For clinical case mana

Why should I care??

Why does it matter??



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Conclusion

- Answer the research question
- Begin with a signal phrase
 - *We found that...*
 - *Our data confirm the conclusion...*
- State implications for public health, surveillance, or clinical case management
- Make recommendations
 - Changes in practice or policy
 - Future studies, including specifics

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Final Tip for the Conclusion

Do not color your study or results with adjectives such as "striking", "interesting", "excellent"...

If your results are "striking", your readers will know!

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Class
Exercise


*Write an abstract for
the Haiti Cholera paper!*

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Title

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Title

- The most frequently read part of an abstract
- Important in locating abstracts on a topic
- Accurate summary of the abstract

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A Good Title Should...

- Accurately, completely, and specifically identify main topic
- Be unambiguous and concise
- Contain important words to attract attention; contain words used for indexing
- Include independent and dependent variables

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Avoid...

- Titles that are too cute or too scholarly
- Subtitles (unless needed)
- Acronyms (except those widely known, like HIV)
- Noun clusters or strings of adjectives
- Jargon

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Example...

Determine prevalence and characterization of cryptosporidium among children aged less than sixty months and adults who are positive for HIV by improving the laboratory's capacity to diagnose cryptosporidium via polymerase chain reaction and molecular characterization

Improving Diagnosis of Cryptosporidium

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Example...

Monkeying around with trypanosomiasis

Vervet monkey model of trypanosomiasis

Development of a vervet mokey model for the study of human African trypanosomiasis

Development of a safer laboratory vervet monkey model for the study of human African trypanosomiasis

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Things to Remember

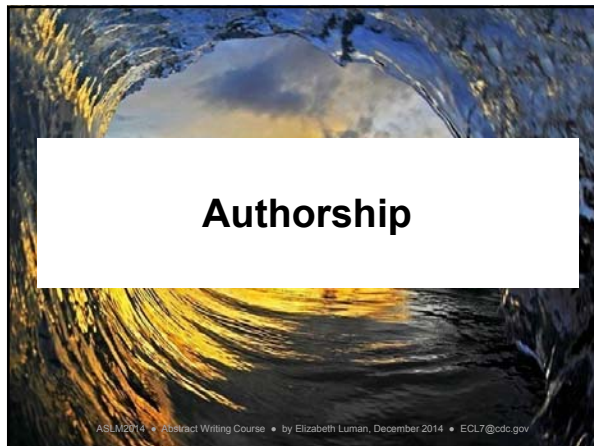
- Title should have high scanning value
- A title that is general is usually meaningless
- Express only ONE idea in the title
- Keep title specific and short
- Use terminology that a general audience will understand

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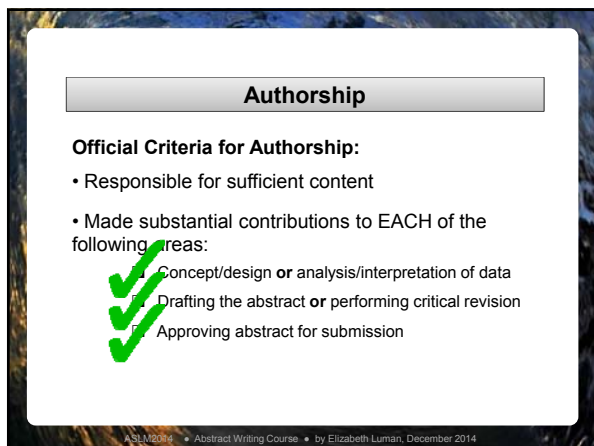
Class Exercise

Write a title for the Haiti Cholera paper

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Authorship

Not Included:

- ~~Funding or Approver of Funding~~
- ~~Department supervisor~~
- ~~Clearing reviewer~~
- ~~Director of the institution~~

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Authorship

Reality

- My boss insists on being an author on every paper*
- I have been told to include lower level people to build capacity*
- I have to include someone from the XYZ or they won't give approval for publishing the data*
- I have been told to include some big-name scientist to increase the likelihood of publication*

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Authorship

Sticky Issues

- Political Authors, Funding Authors, Clearance Authors
- People that demand to be added after the study and abstract are finished
- Laboratorians, data collectors, statisticians, graphics specialists??
- Authorship order

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Authorship Tips

- Discuss authorship before the study begins

Tip – the sooner you discuss authorship, the better!

- Evaluate everyone's stake in the project, their participation, their expertise
 - Give those "political" authors an opportunity to fulfil authorship requirements
 - "Authorship contributions" commonly required
- Divide up a large study into several abstracts to help even out the workload and the credit

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Authorship Tips

- Agree on individual roles and responsibilities and reflect this order in the list of authors
- Build an effective team – what help do you need?
 - High level mentorship
 - Data analysis
 - Laboratory testing
 - Writing support
 - Time-consuming tasks
- Consider encouraging a young professional
 - Mentorship – build capacity
 - Authorship strong motivator

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Format

- Authors
 - First name, middle initial, last name
 - Separated by commas, last one separated by "and"
 - Degrees? Check guidelines. If so, usually just terminal degree
 - No titles (Dr, Prof, Mr, etc.)
 - Affiliations numbered in order as they come with authors, superscript

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Development of a safer laboratory vervet monkey model for the study of human African trypanosomiasis

Maxwell J. Waema¹, Naomi P. Maina², Simon R. Karanja¹, Beatrice G. Gachie², Maina I. Ngotho³ and John R. Kagira⁴

Affiliations:
¹Institute of Tropical Medicine and Infectious Diseases, Jomo Kenyatta University of Agriculture and Technology, Kenya
²Biochemistry Department, Jomo Kenyatta University of Agriculture and Technology, Kenya
³Animal Science Department, Institute of Primate Research, Kenya
⁴Department of Land Resources Planning Management, Jomo Kenyatta University of Agriculture and Technology, Kenya

Correspondence to: John Kagira
Email: jkagira@yahoo.com
Postal address:
Jomo Kenyatta University of Agriculture and Technology, P.O. Box 62000 – 00200, Nairobi, Kenya

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Authorship Tips

- Authorship order
 - First
 - Second / last (senior)
 - Middle
- Presenting or corresponding author
- Consider using a group authorship format or a mix
 - Huge study with many partners
 - Long study with expected staff attrition
 - Data from many countries

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Example – Group Authorship

Evidence from 617 Laboratories in 47 Countries for SLMTA-Driven Improvement in Quality Management Systems

Katy Yao¹, Elizabeth T. Luman¹, SLMTA Collaborating Authors²

1) International Laboratory Branch, Division of Global HIV/AIDS, US Centers for Disease Control and Prevention (CDC), Atlanta, Georgia
2) See group authorship table

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