Can you write better, more efficiently, and not hate the entire process?

Bill Miller, MD, PhD, MPH
Professor, Department of Epidemiology
University of North Carolina at Chapel Hill
Editor-in-Chief, *Sexually Transmitted Diseases*
Associate Editor, *Epidemiology*

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What is the purpose of writing*?

Communication

Write for the READER

*Several points are adapted from Gopen & Swan

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The STORY

Tell a story!

Tell a story!!

Tell a story!!!

Whether a manuscript or a grant, tell a compelling story

What are the MAIN things you want the reader to know and remember?

1 or 2!!!

REMEMBER: Most of us will remember only one or two key points from a paper

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Manuscript structure – a formula

All papers are different BUT their structure is similar

Research manuscripts typically follow a general formula

If you follow this general formula, you'll find it much easier to write

AND your readers will be more likely to understand your paper & take away the points you want them to take away

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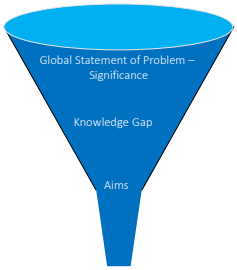
Basic Structure: Part 1

Introduction:
2-4 paragraphs
- big picture
- gap
- aims



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Basic Structure: Part 2

Methods:
- design
- population
- (intervention)
- outcome, exposure, other variables
- statistical analyses

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Basic Structure: Part 3

Results:

- Response rates (eligibility, etc)
- Population description (Table 1)
- Bivariable relationships (Table 2)
- Multivariable analyses (Table 2 or 3)
- Additional specific analyses or sensitivity analyses

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Results

Tell the story!!!

Identify the 1 or 2 key things you want the reader to remember

Use past tense

You rarely can report all of your data or analyses

Use topic sentences and other qualitative statements to make the points that you want to emphasize to the reader.

- People will remember these statements, not the specific numbers.

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Results

Avoid pseudo-precision. Do not report too many digits past the decimal.

Percents: rounded to nn%, n.n%, 0.nn%, or 0.0n%

Risk ratios/odds ratios: rounded to nn, n.n, 0.nn, or 0.0n

Unless the sample size (or context) justifies more significant digits

	25%	2.5%	0.25%	0.03%
RR = 15		1.5	0.15	0.02

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Unadjusted and adjusted results

Include both unadjusted and adjusted analyses

- unadjusted analyses reflect the data as they are
- comparing unadjusted and adjusted analyses give insight into the impact of adjustment

In descriptive studies, carefully consider whether adjustment is necessary

Be clear what type of analysis you're doing:
Descriptive
Predictive
Causal

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Sample Table 1

Characteristic	Index Participants: Overall n=502 n (%)	Intervention n=126 n (%)	SOC n=376 n (%)
Self-identified gender			
Female	75 (15%)	16 (13%)	59 (16%)
Male	427 (85%)	110 (87%)	317 (84%)
Age at enrollment (years)			
18-19	1 (0.2%)	0 (0.0%)	1 (0.3%)
20-29	81 (16%)	21 (17%)	60 (16%)
30-39	328 (65%)	85 (68%)	243 (65%)
40+	92 (18%)	20 (16%)	72 (19%)
Unemployed (last 3 months)			
Yes	305 (61%)	78 (62%)	227 (60%)
No	197 (39%)	48 (38%)	149 (40%)
	Median (IQR)	Median (IQR)	Median (IQR)
Years since HIV diagnosis	1.4 (0.07, 6.4)	2.1 (0.08, 8.4)	0.8 (0.07, 5.9)
HIV-1 RNA (log_{10} copies/mL)	4.6 (4.0, 5.0)	4.6 (4.0, 5.0)	4.6 (4.0, 5.0)

Things to note:

Gridlines only for headings

Age given in categories; Other continuous variables at the bottom

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Results/Tables: a little "peeve"

Do not write: "Table 1 shows the characteristics of the study population"

Instead write: The study groups were similar after randomization (Table 1).

Do not waste words!

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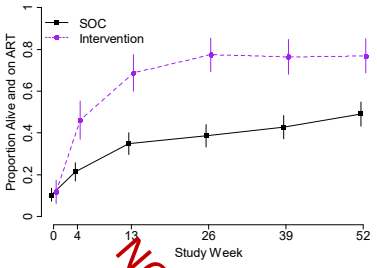

Figure 2: Proportion Alive and on ART – Index Participants.

NO!!!

Figure & Legend

Provide clear & complete figure descriptions—a legend is not just a title

- figure stands alone without reading main text

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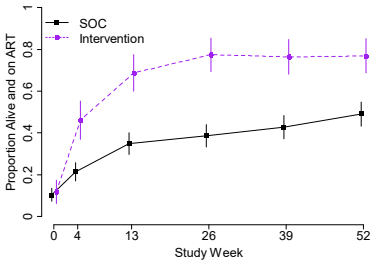

Figure 2: Proportion Alive and on ART – Index Participants. The figure shows the proportion of indexes who were alive at each study week and reported that they were on ART. 95% confidence intervals are calculated with the Wald method. Purple dashed line: intervention; black solid line: standard of care.

Figure & Legend

YES!!!

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Basic Structure: Part 4

Discussion:

- Overview of findings in context
- Interpretation of findings in relation to other literature
- Full discussion of other limitations not incorporated into interpretation
- Implications
- Conclusion

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Discussion: primary purpose

Convey the importance of your work

Relate your findings to previous work

Identify the limitations of your work

Identify the effect of the limitations on your work

Put your work into the larger context of the research

Remember: Readers will only retain one or two key points, not the details
- emphasize these points

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A special note on limitations

Avoid the "litany of limitations"

Weave the limitations into the main discussion
- the strengths/weaknesses of your work are key considerations when comparing to previous studies.

If you can't work into the discussion elsewhere:

State a specific limitation, address the effect it might have, and finally address why or why not we should be worried about it
- this will take a paragraph for each, not a sentence

This study is subject to several limitations. First, we did this. Second, we didn't do that. Third, we could have done this but we didn't. Fourth, we also did this. Despite these limitations, this study is great.

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More on limitations

Consider sensitivity analyses

Be upfront and honest about the limitations
- If a reader is likely to think it is a limitation, address it.
- Do not address trivial issues

Consider addressing critical limitations, or a perceived limitation, early in the discussion.

The more clearly you acknowledge the limitation, the better chance you have that the reviewer will accept your forthrightness.

If you feel a limitation is so significant that you don't really believe your results, don't publish the paper!

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Implications/Conclusion

Finish the story!

Remind people of the key things you want them to remember

Consider real policy implications, but don't overstate

Avoid simple statements like "more research is needed"

Tell readers what is needed!

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Abstract

The abstract is read more than any other part of the paper

Must accurately reflect content of paper
- No data in abstract that are not in the paper!

Structured abstracts are better (use a structured outline, even when not required)

Write a real, justified conclusion – not "more research needed"

Follow journal's instructions for the abstract (Structured vs not; word count)

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A few tips on writing style

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Do NOT make the reader THINK

Failure to use expected structure makes the reader have to expend energy to create it.

Clear writing with the expected structure enhances comprehension.

Thinking (by the reader) usually means…

"Hmm, the reader doesn't get what I am trying to say. My writing isn't clear."

Not – "Oh, the reader isn't smart enough to understand what I am trying to say. They should read it again."

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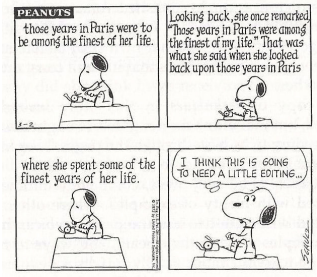
Write simply

"Simplify, simplify"

"Actually, a simple style is the result of hard work and hard thinking; a muddled style reflects a muddled thinker or a person too arrogant, or too dumb, or too lazy to organize his thoughts."

- Zinsser



Edit to simplify!!!

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Focus on the science not the literature! Avoid clutter!**

Previous research has shown that the earth is round.

The earth is round.[REF]

Smith and Jones previously demonstrated that cats have whiskers.

Cats have whiskers.[REF]

**And increase clarity!!!

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Use the science! Avoid clutter!

But what if the issue is less certain than the earth being round? What if the science is unclear or debatable?

The earth may be round.[REF]

Cats probably have whiskers.[REF]

Uncertain, unknown, unclear, may, possible, probable, debatable, doubtful, dubious, controversial, disputed, questionable, ambiguous

We use words all the time to express uncertainty.
We can do the same in our writing.

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Passive & active voice

Passive	Active
It is recommended by the authors of the present study that…	We recommend
The following results were obtained	We obtained these results; We observed
It was discovered that a sustained coordinated effort would be required	We need a sustained coordinated effort

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Avoid isolated pronouns: This, These, Those

A directed acyclic graph was used to identify the covariates used in this analysis. These were gender, age, year of first HCT report…

These what?

A directed acyclic graph was used to identify the covariates used in this analysis. The covariates were gender, age, year of first HCT report…

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Unearth verbs buried as nouns

Antibody detection was accomplished by Team A.

Antibody detection was accomplished by Team A.

Team A detected antibodies.

Buried verbs are everywhere.
If you look, you will find them!

Antibodies were detected by Team A. (passive, only if necessary)

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Practice being concise

A majority of	Most
A small number of	A few
agreement with	agrees
arrived at a decision	decided

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Practice being concise

In order to	To
At this point in time	Now, currently
has been shown to be	is

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One of my least favorite words

Individuals

Reserve individual to contrast with a group

People
Persons
Adults
Children
Men
Women
…

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Improving flow, improving clarity

Old before New

Old before new is one of the most critical concepts in writing clarity and flow.

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Old before New

Old information in the topic position: linking backward to previous sentence

New information in the stress position: new, emphasis-worthy information

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Old before New: Your answer to "It doesn't flow"

Old before new will almost always correct problems with flow.

Flow issues arise from two basic problems:

a) inversion of a sentence (new before old)

Old → new. New → old.

b) logical gaps

Old → new. New → new.

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Old before New

Young women in South Africa face an unparalleled HIV burden; by the time they reach the age of 21, more than a third will be infected.

Based on what you have read, what are you expecting the next sentence to be about? What should be in the topic position of the next sentence?

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Old before New

As originally written:

Young women in South Africa face an unparalleled HIV burden; by the time they reach the age of 21, more than a third will be infected. Unequal sexual relationship power may play an important role in contributing to high HIV incidence among young South African women.

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Mood changes

Use a word at the beginning of the sentence to clearly state the change (transition) in mood/direction.

But, yet, however, nevertheless, still, instead, thus, subsequently

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A few tips on getting your writing done

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What is the most important body part for writing (and rewriting)?

YOUR BUTT

Or possibly your feet if you use a standing desk…

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Your butt.

You can't write if you don't spend time with your butt in the chair and your hands on the keyboard.

Yes, you can spend time to think away from the keyboard, but you MUST be in the chair to make it happen.

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Content/Structure <> Writing/Editing

Write for content

Rewrite for clarity and concision…and continuity…and coherence…and content

Put your ideas down when you write.

Fix the structure through rewriting and editing.

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Key steps to successful writing

1) Make a schedule – and stick to it. Put it in your calendar. Several hours per week – every week. Ideally, write a little every day
2) Commit to writing consistently Avoid binge writing!
3) Write in places where you are comfortable and can think with minimal distraction
4) Give your self specific goals for a specific writing session

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Key steps to successful writing

5) Identify the storyline of your paper/proposal. Revisit that every time you start to write.
6) Use effective outlines (i.e. topic sentences or complete thoughts)
7) Stop when you're in a good place, so you can pick up easily the next day

Resist the urge to forge ahead because things are going well. Stop. Jot a few notes. Then pick it up tomorrow.

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Procrastinating? …We all do it!

To get over it:

Tell someone about your commitment. Commit to work for 15-20 minutes. Tell your friend you did it!

Remind yourself again of why you're writing

Procrastination often comes from fear → What are you afraid of?

Work in short chunks. Get up. Walk. Refresh. Take a real break, not your usual procrastination activities (social media, internet, etc.)

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Getting a paper started

Writing the paper begins before the study
- Specifying the hypotheses
- Writing the background for the proposal or protocol
- Writing the methods in the proposal or protocol
- Determining the analysis plan for specific research questions

Use existing text from proposals/protocols/abstracts/posters/presentations to get started.

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Order of writing

Draft methods early – even before study is complete

Make tables

Draft results

Draft introduction & discussion

Abstract - last (or first!)
- last → describe findings accurately
- first → forces writer to focus on main story

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Working with your co-authors

When to talk about it…

What should happen…

What to expect…

Improving the process…

Co-authors can be well…challenging. Be proactive and know what to expect

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Working with your co-authors

When to talk about it…

What should happen…

What to expect…

Improving the process…
- Give deadlines
- Share early drafts, asking for content feedback only, "please don't worry about grammar and sentence structure, yet"
- Explain exactly what you are looking for → tell your busy co-author that you want them to look at the 3rd paragraph in the discussion

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When you are a co-author

Establish your role early; identify your niche

Be timely

Ask explicitly what the lead author wants from you

Provide feedback: In the way you would want it

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Timeline for papers

Share drafts early

Accept criticism

Don't underestimate the number of drafts

One of my recent major papers had 31 drafts.

You must be PATIENT with the process

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A few thoughts on reviews

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Responding to reviewers & editor

Revise quickly

Write for the editor and the reviewer
- you do not know for sure whether it will go back out to the reviewers

Enumerate each issue raised by the reviewer
- copy word for word

Draft a response that highlights the changes made in the manuscript
- word for word if short; only point to place in text if long change

Be prepared to shorten as necessary

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Responding to reviewers & editors

Be conciliatory in your tone. The reviewers are "right" to some extent, even when you disagree.

Do all of the easy/moderate changes, even when you disagree (unless it really weakens paper)

Do the hard changes that will really strengthen paper

Resist the hard changes that will take too long, be too difficult, or will not improve paper
- Make a clear argument why you don't want to make the change
- Often, additional language in discussion can be used instead of major additional analyses

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Future Events/Programs

- Nov 10: Tips on mitigating bias in letters of recommendation
- Nov. 13: Aligning Career Goals with Advancement
- Nov. 28: Annual Frank C. Wilson Professionalism Forum.
- Nov. 30: Conflict Engagement as a Leadership Competency
- Dec. 1: Women in Medical Science Conference: EmpowerHER - Advocating Professional Development
- Spring 2024: Scientific writing workshop: 4 or 8 hours?

To learn more about FALD events and programs, visit https://go.unc.edu/FALDevents.

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bill_miller@unc.edu
Feel free to reach out for the slides or my manuscript writing guide

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Thank you for coming!
We want to hear from you!

https://go.unc.edu/writingeval

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Several lines of evidence suggest that a selective "bottleneck" contributes to the restricted diversity at HIV-1 transmission. If the homogeneity in the transmitted virus reflected stochastic selection of 1 or a few variants for transmission, we would expect that the transmitting virus would most frequently resemble the predominant species in the source. Although limited by infrequent sampling that can skew the relative frequency of the different variant populations detected, many transmission studies demonstrate differences between the transmitted virus and the predominant variant in the blood [5, 6, 14, 15] or genital tract [16] of the source subject. In addition, HIV-1 transmission is characterized by the strict selection for variants that use the C-C chemokine receptor type 5 (CCR5) coreceptor, despite C-X-C chemokine receptor type 4 (CXCR4) variants in the partner [6, 17–19]. Finally, recently transmitted variants of HIV-1 subtypes A and C, though not necessarily subtype B, typically have shorter envelopes and/or fewer potential N-linked glycosylation sites than chronically infected subjects [14, 15, 20–24]. Together, these data suggest that the limited viral diversity during HIV-1 transmission is not simply a stochastic event, but rather that it may also involve selective pressure for particular envelope features.

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In 1993, Zhu et al proposed that HIV-1 selection is reset at transmission, with evolution starting over in newly infected individuals [6]. More recently, several investigations have suggested that transmitted and/or early variants are more closely related to the donor's ancestral sequences. In an examination of HIV-1–infected subjects followed longitudinally, Herbeck et al found that HIV-1 interhost genetic diversity and divergence are significantly less during early infection, suggesting evolution toward an ancestral state following transmission [20]. Sagar et al directly examined the characteristics of viruses selected during transmission by examining 13 linked heterosexual transmission pairs from the Rakai Community Cohort Study (RCCS) [14]. The transmitted variants differed from the donor sequences and were more closely related to the computed most recent common ancestor of the donor virus than they were to the majority of contemporaneous viruses, suggesting that variants with ancestral features were favored for transmission [14]. These studies left open the question of whether early donor viruses are archived and favored for retransmission or whether the virus evolves immediately after transmission in the absence of the selective forces driven by a robust immune response [20, 25].

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Rewrite

When HIV-1 is sexually transmitted, only one virus variant is typically transmitted from the index to the previously uninfected partner. If the transmitted variant was selected randomly, we would expect the index partner's predominant viral variant to be transmitted most commonly. But this predominance is not observed. Instead, transmitted variants pass through a bottleneck; certain variants with specific characteristics are transmitted more often. Characteristics that enhance transmission include the use of the C-C chemokine receptor type 5 (CCR5) coreceptor and, for HIV-1 subtypes A and C, shorter envelopes and/or fewer potential N-linked glycosylation sites.

Transmitted variants are closely related to ancestral HIV-1 variants, suggesting an adaptation for transmission. Among people with early HIV-1 infection, viral genetic diversity is considerably less between persons. Furthermore, in the Rakai Community Cohort Study, the viruses in the newly infected partners resembled the most recent common ancestral virus among the couples more than contemporaneous circulating viruses in the transmitting partners. This observation supports the hypothesis that ancestral variants have a transmission advantage. Alternatively, the virus could evolve rapidly after transmission to the ancestral state given the absence of a robust immune response during early infection.

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