

Argument, Structure, and Credibility in Public Health Writing

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Some of the most important questions we face in public health include what policies we should follow, which programs and research should we fund, how and where we should intervene, and what our priorities should be in the face of overwhelming needs and scarce resources. These questions, like many others, are best decided on the basis of arguments, a word that has its roots in the Latin *arguere*, to make clear. Yet arguments themselves vary greatly in terms of their strength, accuracy, and validity. Furthermore, public health experts often disagree on matters of research, policy and practice, citing conflicting evidence and arriving at conflicting conclusions.

As a result, critical readers, such as researchers, policymakers, journal editors and reviewers, approach arguments with considerable skepticism. After all, they are not going to change their programs, priorities, practices, research agendas or budgets without very solid evidence that it is necessary, feasible, and beneficial. This raises an important challenge for public health writers: How can you best make your case, in the face of so much conflicting evidence?

To illustrate, let's assume that you've been researching mother-to-child transmission (MTCT) of HIV in a sub-Saharan African country and have concluded that (*claim*) the country's maternal programs for HIV counseling and infant nutrition should be integrated because (*reasons*) this would be more efficient in decreasing MTCT, improving child nutrition, and using scant resources efficiently. The *evidence* to back up your claim might consist of original research you have conducted that included program assessments and interviews with health workers in the field, your assessment of the other relevant research, the experiences of programs in other countries, and new WHO guidelines. But now that you have collected and analyzed your data and reviewed all the other salient information, how can you best *communicate* your findings so that decision-makers in the Ministry of Health are persuaded that your reasoning is valid and your conclusions and recommendations are sound?

I propose that the only way you can reliably do this is to give skeptical readers all the information they need to evaluate your analysis and its conclusions: the claim; the evidence and reasons that support the claim; the limits or objections to it; and your response to the evidence and conclusions that conflict with your own. In other words, to be credible, public health writers need to frame their work as *evidence-based critical arguments*; that is, as a *logical sequence of reasons and evidence* that support a *claim*, or justified conclusion, and *assess evidence for validity*.

At Harvard TH Chan School of Public Health, everything you write needs to be framed as a critical argument, regardless of whether it is a course paper, thesis, dissertation, grant proposal, program application, policy brief, research study, oral presentation, scientific poster, conference talk, or job cover letter. Overall, your professors expect you to read a great deal of conflicting evidence, assess it, and then take a stand and present an argument as to what you think it all means, and why.

Accordingly, in this paper I examine key structures of texts and critical arguments in public health writing. My goals are to present you with a different perspective on things you may already know, to demonstrate the importance of clearly communicating your ideas to your readers, and to provide you with tools and strategies for understanding and fulfilling your role as a writer-thinker at the School and as member of the global public health community.

Form Follows Function: Argument–Text Structures

As we have seen, arguments in their most basic form consist of three elements: claims, reasons, and evidence. *Claims* are sometimes also referred to as the thesis, main point, “answer” to the question you have been investigating, or what you conclude should be done in a given situation. However, if your claim is to be more than opinion, it must be backed up by both *reasons* and *evidence*. Furthermore, your reasons must be logical, and you need to make your case using the strongest and most pertinent evidence possible. Another key element to a strong argument is to refute competing arguments by critically assessing their claims and evidence and pointing out inconsistencies, limitations, etc.

When readers critically review a document, the first things they need to know are, what the problem is, why it’s important, and what the author proposes be done about it (the *claim*). Readers usually need this information in the paper’s *introduction*, so that they can evaluate how the author deals with all the evidence (especially conflicting reports) in the *body* of the paper, and then decide in the *conclusion* whether the author’s reasoning is correct and the recommendations are justified.

This is the flow of information the Ministry of Health decision-makers need. If you are going to argue that the two health programs mentioned above should be integrated, your readers need to know this by the end of your introduction, so that as they continue reading they can assess how you handle the evidence and reach your conclusion. Your job as a writer is to navigate readers through your argument to a justified conclusion by providing them with the best possible reasons and evidence, and refuting the main arguments that counter yours by showing their limitations or lack of validity.

Figure 1. Basic Introduction-Body-Conclusion Argument-Text Structure

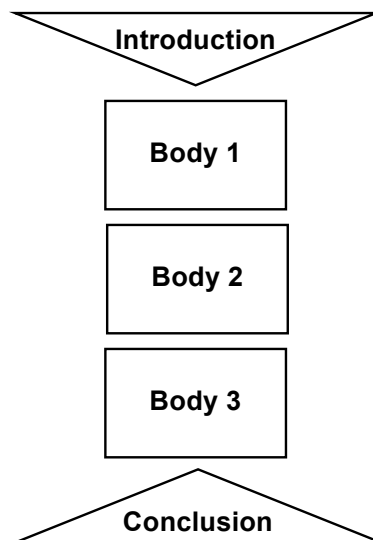


Figure 1 illustrates the well-known Introduction–Body–Conclusion (IBC) format for organizing and structuring the flow of written information. Almost anything you write is going to follow this form or some variation on it. Many of us are so familiar with it that we often overlook what a powerful reader-centric engine it is for developing and critiquing arguments. By “reader-centric” I mean that this format provides readers with a narrative structure that allows them to efficiently and accurately assess arguments as they unfold.

The IBC format can be traced back 2400 years to Aristotle, who was the first to describe it in his analysis of the elements of writing. Aristotle saw that all stories had to have an *incentive* (beginning), *climax* (middle), and *resolution* (conclusion or end). He also considered the most important element in storytelling to be the plot, or how the author arranges and introduces information to the audience. It is from these insights that the format for critical arguments has developed.

IBC has persisted for more than two millennia because it is a simple, flexible, scalable, and robust format for providing critical readers with the information they need, and it is still undergoing development. For instance, in the 1970s, the editors of the BMJ, Lancet, JAMA, NEJM and other medical journals adopted an IBC variant, the IMRAD format (Introduction, Methods, Results and Discussion), for the reporting of all original research, as its clear format facilitates peer review and comparing studies.ⁱ Today, all the sciences report their research in their own variations of the IMRAD format. Grant proposals use it, too.

Narrative Form and Flow

The shapes of the different sections in Figure 1 also illustrate how the information in an argument can best be arranged for optimal flow and persuasiveness.

Introductions, which flow from greater issues to specific ones, are *deductive arguments*; their great logical strength is that, if their premises to an argument are true, then the conclusion must also be true. Deductive arguments are either valid or invalid, true or not true. Beyond that, introductions are particularly complex as they have at least three core functions that provide readers with the key information they need so they can critically analyze the argument as it unfolds: the background to the issue, the identification of a problem, and the author's response to the problem in terms of what should or will follow.

Figures 1, 2, and 3 all illustrate how introductions, as deductive arguments, begin broadly and rapidly narrow—this represents how they often begin by concisely presenting background information on the issue (e.g., the basic epidemiology and burden of a disease) before identifying the specific issue that will be investigated (e.g., the risk of certain populations to the disease). In their invaluable book on writing, “The Craft of Research,” Williams et al describe this as establishing “common ground” between the writer and reader on what will be discussed.ⁱⁱ

Once the background is established, introductions then narrow to identify a specific problem or issue embedded in the wider context. The key technique for revealing this problem is to identify a *gap*, usually in terms of health (e.g., hidden discrepancies between different groups), practice (e.g., health services or information are not being delivered adequately to a certain population) or knowledge (e.g., little or no research has been conducted on the topic, or research findings on the subject conflict). This gap method is used in almost every type of writing and is critically important, as it usually motivates the entire project. As such, the author should make the gap as clear and explicit as possible.

The third and final main step in writing an introduction is to propose a response to the gap. This is the “claim,” which will depend on the writer's purpose and audience. It could be a statement of what the author thinks should be done in a given situation (e.g., integrate the HIV counseling and infant nutrition programs) or the justification for conducting additional research; in some cases it is an overview of the main finding or recommendation, followed by a brief description of what will be addressed in each section of the paper. The format is quite flexible here, and different types of texts can take slightly different forms, just as different disciplines have different conventions as to what sort of information needs to go at the end of the introduction.

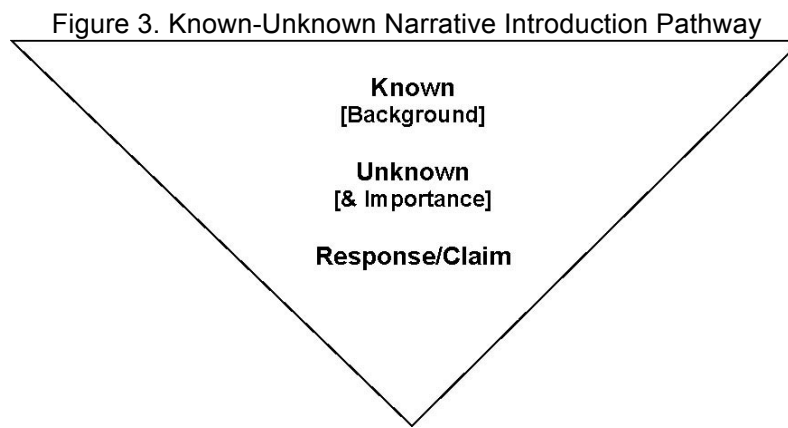
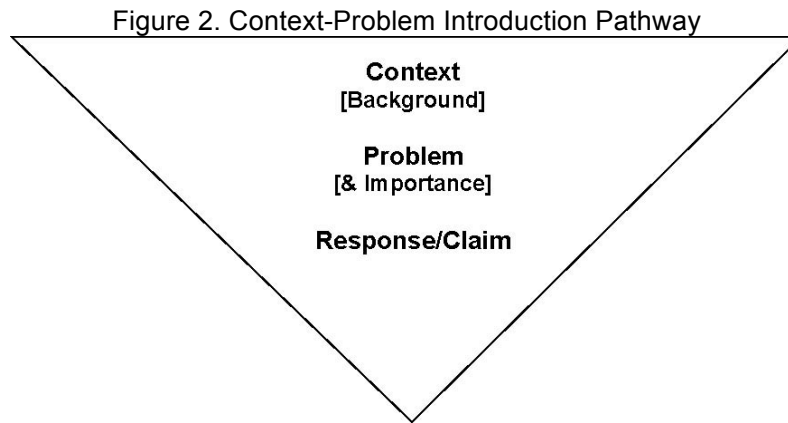
To illustrate, let's assume you are writing a paper on infant mortality in Boston, with a focus on eliminating racial and ethnic disparities. Before getting to your main point, the first step would probably be to place Boston's infant mortality rate (5.8 in 2008ⁱⁱⁱ) in a wider context, probably by comparing it to the U.S. (6.86 in 2005, the most recent data available at the time of this writing^{iv}). The second step would be to identify the problem you will address, the racial disparities in the infant mortality rate: the overall rate in Boston may be lower than in the U.S., but for black babies born in the city it is 13.2, which is more than twice the city's overall rate and nearly 4 times the rate of white babies (3.6).^v Your response to this situation could take various forms, including a community-based intervention, a pilot program for an educational outreach program involving local hospitals and community health centers, or research to identify the social determinants.

As mentioned above, the response or claim usually needs to be stated at the end of the introduction so that readers are exposed to it before they read the rest of the argument. In fact, the mathematical and biological sciences report their main finding at the end of the introduction—a style that the population health sciences, such as epidemiology, do not follow. Inexperienced writers often leave their claim/conclusion to the end of the paper. This “detective story” format can work well in fiction but should be avoided in public health writing. It is very inefficient, and your readers are very busy people: they want to know what you propose up front, so they can evaluate your claim as they read through and assess your argument.

In many sciences, identifying a gap is sufficient grounds for conducting the research. But in public health, we usually need to include one last piece of information in our introductions: some indication of the burden of the disease or condition (e.g., mortality, morbidity, incidence, prevalence, cost estimates, DALYs). This is a response to the implicit “So what?” question that is often foremost in the skeptical reader's mind: “What's the relevance of this issue, how important is it, and why should I care?” Together, the health problem and its burden constitute reasons that support the claim.

Using either of the two following pathways (Figures 2 and 3), the writer's argument proceeds as follows:

- *Presents* the background to the issue, or the most important things known about it
- *Identifies the gap*—a problem within this context that's been overlooked, or the issue on which knowledge is conflicted—and why it's important to address the issue
- *Claims how the problem should be addressed*. Conventions vary as to what information goes into this third part of the introduction. Most of the time what's given here is an overview of what follows in the paper, along with a general conclusion or claim. This is also the format used in IMRAD studies in the mathematical and biological sciences (e.g., biology, biostatistics, economics); in the population sciences (e.g., epidemiology), the end of the introduction gives an overview of how the issue was studied but no findings, conclusions, or claims.



These pathways fulfill the three main requirements of an introduction, whose function has not changed since ancient times: the purpose of the *introduction* for the Greeks (*proemium*) and Romans (*exordium*), just as it is for us, was to prepare the audience for the discourse and story that will ensue.^{vi} To do this, either of the above variants work well, though researchers usually find that Figure 3 suits their needs best. Furthermore, these pathways can be used for almost any topic and to write almost any type of document.

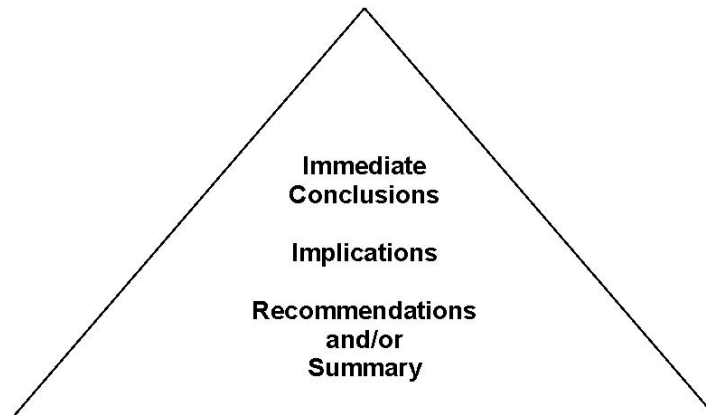
The *body* sections deal with specific matters of evidence and, as such, are much more descriptive and much less narrative than the introduction and conclusion. The body is the longest section of the paper and can be the most complex. For that reason, it is often worthwhile using subheadings to organize information into appropriate categories. Good writers know that the more complex an issue is, the more important it is to make things clear for their readers.

The point I wish to emphasize here is that it is in the body that the author assesses all the relevant evidence, including the counter-arguments and counter-evidence. An author who does not directly deal with these issues produces only opinion—and the decision-makers in the Ministry of Health don't need opinions: they need to know, “What do you have to say about what researchers [X] and [Y] report? Why do your recommendations differ from theirs? Why should we change the way we are already doing things?” Authors must successfully respond to the main counter-arguments and counter-evidence to their claims. Otherwise, they will have no credibility with their readers.

Your entire argument is bookended by the introduction and *conclusion*. Conclusions (or *Discussions* in scientific writing) are the inverse of introductions (Figure 4): they are *inductive arguments* whose overall pathway is from the specific to the more general. They

often begin with an immediate conclusion that “fits” with the introduction’s claim, then go on to discuss wider issues (e.g., the public health implications of the conclusion), often ending with recommendations and/or a summary of the entire argument. Their narrative pathway often looks something like this:

Figure 4. Simple Conclusion Narrative Pathway



Conclusions and introductions complement one another in many ways. For example, nothing should appear in the conclusion that has not already been mentioned or at least implied in the introduction; and they are both intensely narrative, with each constituting an argument in its own right: the deductive introduction needs to identify a problem that warrants action, and the inductive conclusion needs to sum up the entire argument accurately, arriving at a justified conclusion. But while deductive arguments are either valid or invalid, inductive reasoning is probabilistic and must allow for the possibility that the conclusion is false, even when all the premises are true. Inductive arguments are therefore stronger or weaker, more probable or less probable, rather than valid-invalid.

This does not mean that induction is more limited than deduction. In introductions, the gap is implicitly contained in the premises. Therefore, while deductive arguments can reveal something that was not recognized, they cannot produce new information beyond this. The great strength of inductive arguments is that they can create new knowledge by identifying a generalized thread that runs through a number of cases. Science is itself based on inductive reasoning, proceeding from isolated, seemingly unrelated events to theories that tie them together and “explain” them. Inductive reasoning is therefore very common in public health and includes generating hypotheses and statistical inference (from samples to wider populations). Induction also poses a danger, in that authors can be carried away by the implications of their findings and cross the line into causal inference. However, unless your work is in the biological or mathematical sciences, the most you can usually do in a Conclusion or Discussion is demonstrate the probability or level of certainty of your claim being true.

Looking Forward

The better authors know and understand their audience, the better they can connect with them. Becoming a better writer also involves becoming a better reader and understanding what things facilitate the experience of reading and what makes it more difficult. Following this reasoning, a key characteristic of “good” public health writing is reader-centricity: writing that places readers’ concerns at its core by giving them the

information they need to follow and assess your argument. Good writing is shaped to a particular audience, anticipates their questions, and facilitates their ability to analyze and assess the argument. As I have tried to demonstrate here, this reader-centricity can be enhanced through application of the simple yet flexible narrative structures embedded in the IBC format.

Public health touches on all aspects of life, and advancing it requires clear and accurate communication among a wide range of different audiences—including researchers, health providers, administrators, policy-makers, journalists, educators, and individuals and populations at risk—on an array of issues that often include age, race, ethnicity, sex, gender, class, money, politics, education, individual behavior, family, genetics, social environment, discrimination, poverty, power, powerlessness and social justice. No other field deals with so much complexity, and it is difficult to imagine a career in public health in which communicating ideas through writing and public speaking are not vital skills. This brings us to a final consideration.

One of the things that will make a difference in helping all people realize their fundamental right to health is the ability of those in public health to educate, reason, and persuade. This takes leadership—a key component of which is communication, as is reflected in the School’s mission to advance the public’s health “through learning, discovery, and communication.” I look forward to exploring all these issues with you in our writing course.

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