writing for green

Types of Evidence / Hierarchy of Evidence

When you speak, most people, whether they realize it or not, are judging you through the lens of credibility. When speaking to someone with whom you are close, you may already have credibility based on "past performance" or simply based on the nature of your relationship with that individual. Still, even if your friend or relative is inclined to give you "the benefit of the doubt" they may still implicitly demand some evidence. For example, if your child tells you they received an A- in English History, a course which they struggled with in the past, you will congratulate them and may offer to take them for an ice cream to celebrate... but later you'll probably log onto the school's website and check for yourself. If that same child, in order to continue as a member of the basketball team, was required to prove they received at least a "C" in this course (after a failing grade in the previous term), the coach would likely require documentation.

As a writer, as a matter of both ethics and efficacy, it is important that every fact is substantiated. The type/ rigor of the substantiation is a factor of both the audience, and the type of data you are citing. For instance, if you are reporting on the impact of your organization's work, you may refer to internal program data as the source of information for, e.g., the number of individuals served, amount of money raised, or the satisfaction-level of participants. This type of substantiation, while not necessarily from an independent source, is reasonable. Alternatively, if you are writing an application to the EPA, and seek to convince the reviewers that air pollution is a concern in your community, you will need to cite data that can be verified. In this case you may elect to cite data from the EPA's own online GIS tools (such as https://www.epa.gov/ejscreen), the US Census, reports published by the government, or sourced from articles published in peer-reviewed journals.

Below are (1) examples of different types of data, sources, and instances when you may consider using each; and (2) locations where credible data can be sourced (these lists are not exhaustive).

What are some examples of "evidence" that you may want to include in a grant proposal?

- Statistics related to the impact of certain types of pollutants on health
- Effectiveness of interventions that are intended to…
    - Change a behavior (such adopting a beneficial health practice, or engaging in local advocacy efforts)
    - Improve a health metric among people with specific demographic attributes and/or living in a specific geography
- Impact of sea-level rise on low-wealth communities located on unincorporated land relying on private septic systems rather than a sewer system
- Prevalence of cancer in one community (e,g., low-wealth, close to source of pollution) vs. another

Important note: *Before delving into the various types of evidence, it's important to note the biggest distinction in the hierarchy of evidence: primary vs. secondary sources.*

- **Primary source** - the original source of the evidence (example: a scientific study published in a peer-reviewed journal article)
- **Secondary source** - a source which cites the original source (example: New York Times cites the article)

Table 1. Quality of various types of evidence, and data sources

Quality	Type of Data	Description/ Appropriate Use
Lowest ⬇️ Highest	**Anecdotal** (stakeholder interviews, news articles/ reports)	May be used in a story to describe the impact of a problem on an individual or community
	Internal program data (org. records, staff interviews, etc.)	Can be used to demonstrate the organization's track record. Data should be available to share upon request, but it is generally acceptable to make statements about one's own work and results.
	White papers/ reports	These can be used to backup statements of claims made in the narrative. These are most effective when the publisher is credible, and well-known to the audience or at least discoverable. Be sure to properly credit the source/ author; use quotation marks or indentation to indicate material taken directly from a paper. If a white paper references data from another source, you should verify that the white paper is correct and also cite the original source in your Works Cited document.
	Local/ national media articles	News outlets are not normally primary sources of data. In most cases, the newspaper/ magazine/ website/ news organization got that data from somewhere else (a report, scientific study, a state or federal agency, etc.). Whenever possible, cite from the primary source instead of the secondary source. That being said, if a media outlet is well-known and well-regarded by your target audience, they can sometimes be used to bolster statements in your narrative (particularly in instances where the media outlet may have conducted its own investigative reporting, etc.). New sources known for hyperbole, embellishment, and bias, or for being one-sided, should be avoided as sources.
	Websites associated with evidence-based	At times, you may need to justify a certain program design in order to demonstrate the plausibility of its effectiveness. Materials/ information/ data provided by the developers of interventions that

	interventions	are deemed “evidence-based” (i.e., validated in multiple independent randomized control trials) can be considered highly credible. Similarly, if you are proposing an air-quality monitoring program, presenting or citing data gathered through testing or evaluation of the monitors would be prudent.
	Randomized controlled trials (RCTs)	If you are proposing a public health intervention along with your advocacy work, you will need to demonstrate to reviewers of your grant proposal that your intervention is likely to be effective with your target population, in the targeted setting. For example, as part of your proposed air quality monitoring program you may want to improve access to early interventions to children who may be suffering from asthma. There is no need to create such a program from ‘scratch.’ Perhaps you find an intervention that was tested in a RCT (or ideally, multiple RCTs) with a similar demographic/ setting that utilizes community health workers. Could that intervention, possibly with minor adaptations work for your situation? Interventions that have been tested via RCT and published in peer-reviewed journals will hold considerably more “weight” in your application among reviewers, compared to an idea for a program which has not been similarly tested and evaluated.
	Systematic review	Literature review which addresses the effectiveness of an intervention by identifying and synthesizing multiple sources of high-quality evidence. A published, systematic review which concluded a particular intervention (i.e., related to public health, environment) was effective (within the given qualification) can hold significant weight among reviewers. You might elect to cite a systematic review or meta analysis to justify a particular approach or intervention.
	Meta analysis	A type of systematic review that takes into account the outcomes of multiple evaluation research studies, resulting in a common statistic (representing effect size and/ or magnitude of effect of an intervention on an outcome) that can be used to assess the effectiveness of an intervention.

Table 2. Examples of methods of citing sources within a grant proposal

Citation Method	Example
In-line citation - use this method if the data is basic, easy to find, and can be accurately and succinctly presented	In 2020 the median family income in Barton County, MO was $34,422 which is 22% less than the State of MO (US Census).
Superscript - include the citation directly after the information which has been sourced. The superscript corresponds to a number in the "Works Cited" document which will include a full, properly formatted citation.	In 2021, Barrett, et al reported in the Journal of Environmental Management that 90% of municipalities in Harris County, TX lack permitting regulations to protect low-lying areas.[1]
In-line with author last name, date - this method is typical in academic articles, though the style can be used in any type of document. It may not be ideal if you are limited on space. The citation will correspond to an entry in the "Works Cited" document which will include a full, properly formatted citation.	"A 2021 study published in the Journal of Environmental Management that 90% of municipalities in Harris County, TX lack permitting regulations to protect low-lying areas." (Barrett, et al, 2021)

{this would correspond to a full citation in the Works Cited document}

Authors of a 2021 study in the Journal of Environmental Management noted that, "communities of color are disproportionately impacted by the lack of adequate stormwater permitting, which has resulted in extensive soil contamination and a precipitous decrease in home values." [1]

Sources of Evidence-Based Intervention Strategies & Data

Organizations may struggle when designing components of a program/ intervention - How do you know if funders will "buy into it?" More importantly, how do you know if it is likely to work? Luckily, most ideas have been tried before, and oftentimes they have been tested. It is not always necessary to incorporate evidence-based programs/ interventions into your plans/ grant proposals. Maybe you need ideas about interventions that will result in improved health outcomes, or will benefit youth, or will

significantly reduce air pollution. For those instances when when proposing interventions which are based on evidence is prudent, below is an example of some potential sources.