

CDC Coffee Break: What Counts as Evidence?

Martha Bose, MPH, CHES
CDC Evaluation Fellow
Evaluation and Program Effectiveness Team



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National Center for Chronic Disease Prevention and Health Promotion
Division for Heart Disease and Stroke Prevention



Welcome to today's Coffee Break, presented by the Evaluation and Program Effectiveness Team in the Division for Heart Disease and Stroke Prevention at the Centers for Disease Control and Prevention (CDC). We are fortunate to have Martha Bose as today's presenter. Martha is from CDC's Division for Heart disease and Stroke Prevention, and is a CDC evaluation fellow on the Evaluation and Program Effectiveness Team. My name is Eileen Chappelle, and I'm today's moderator. I'm also a member of the Evaluation Team.

Disclaimer: The information presented here is for training purposes and reflects the views of the presenter. It does not necessarily represent the official position of the Centers for Disease Control and Prevention.

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Presentation Overview

- ❑ Definition and need of evidence
- ❑ Types of evidence
- ❑ Conceptual frameworks
- ❑ CDC case example
- ❑ Tools and resources
- ❑ Q & A

Today I'll be going over the definition of evidence, why we need it, some types of evidence, conceptual frameworks to help guide you, and a CDC case example for evidence.

Definition

“[E]vidence is defined as information or facts that are systematically obtained (i.e., obtained in a manner that is replicable, observable, credible and verifiable) for use in making judgments or decisions.”

FAQs, retrieved from: <http://vetoviolence.cdc.gov/evidence/#panel1-2>. Atlanta, GA: Centers for Disease Control and Prevention. (adapted from Rycroft-Malone et al, 2004 & Brownson et al., 2009).

The exact definition of evidence can be debated. It really depends on the context you're using it. Many people are associated with the idea of evidence through the court or legal system, and evidence can take many forms, such as DNA testing, eye witness accounts, and expert opinions. Like in law, public health evidence can vary in the sources of evidence and in their amount of credibility.

For today's presentation I'm using the definition on the screen, which defines evidence as information or facts that are systematically obtained in a manner that is replicable, observable, credible, and verifiable for use in making judgments or decisions.

Why Do We Need Evidence?

Public health setting:

- Data-driven planning, decision making and resource management
- Compare patterns of performance
- Identify problem areas and program successes
- Inform program improvement and focus program priorities
- Demonstrate program worth to stakeholders
- Substantiate funding requests and advocate for program

Evidence acts as the foundation for program evaluations.

Why do we need evidence? As the definition says, it helps us to make judgments and decisions. Evidence can help us in planning programs, decision making, resource management, comparing patterns of performance, identifying problem areas, and demonstrating program worth to stakeholders, which can then substantiate funding requests. Each of these uses for evidence is an example of an approach or program evaluation. Therefore, evidence acts as the foundation for program evaluations.

What Counts as Evidence?

Short answer: It depends!

- Evaluation question(s) of interest
- Feasibility, Acceptability, Utility
 - Practicality, time, and resource constraints
 - Context of public health setting
 - Intended use and users
 - Assumptions made by stakeholders and evaluators
 - Stakeholder priorities

“The most basic question is not what is best but who shall decide what is best.” – Thomas Sowell

The big question of the day: what counts as evidence? Well, the short answer is, it depends. It really depends on a case by case basis on your program’s public health setting, partners, resources, and goals. However, to kind of guide what counts as evidence, you should really utilize your evaluation questions to limit the scope and the type of evidence you need to answer your evaluation questions. You should also take into account the feasibility, acceptability, and utility in collecting evidence. How practical is it, how much time will it take, and how much will it cost to collect that evidence? You should also take into account the context of your public health setting. Is it ethical to collect your evidence? And how is your evidence going to be used, and who is using it in your program evaluations?

I’d also like to emphasize the importance of your stakeholders. Your stakeholders help prioritize what your priority evaluation questions should be, and what types of evidence are most important and credible in answering those evaluation questions. I like this quote that emphasizes your stakeholders: “The most basic question is not what is best, but who shall decide what is best.”

What Counts as Evidence?

Types of Evidence:

- Experimental – Builds off existing research and literature
 - Randomized control trials (RCTs)
 - Quasi-experimental designs
- Nonexperimental - Provides context
 - Key informant interviews
 - Cost-benefit analysis
 - Census data, national databases (NHANES, BRFSS)
 - Geographic Information Systems (GIS)

“Sometimes what counts can’t be counted, and what can be counted doesn’t count.” – Albert Einstein

I’d like to categorize evaluation into experimental types of evidence and non-experimental types of evidence. Experimental evidence includes rigorous study designs, like randomized control trials. Randomized control trials are what most people think of as the gold standard for evidence because of the rigorous study designs and the amount of existing research in literature that justifies the study design. However, non-experimental types of evidence are also important in your program evaluation because they provide the context that may be easily captured through more rigorous study designs. Although the level of rigor may be lower, they can still be informative. Some examples of non-experimental types of evidence include key informative interviews, low-cost benefit analysis, using census data, or using geographic information system (GIS) mapping.

This quote by Albert Einstein kind of illustrates the importance of capturing qualitative data in addition to quantitative data: “Sometimes what counts can be counted, and what can be counted doesn’t count.”

What Counts as Evidence?

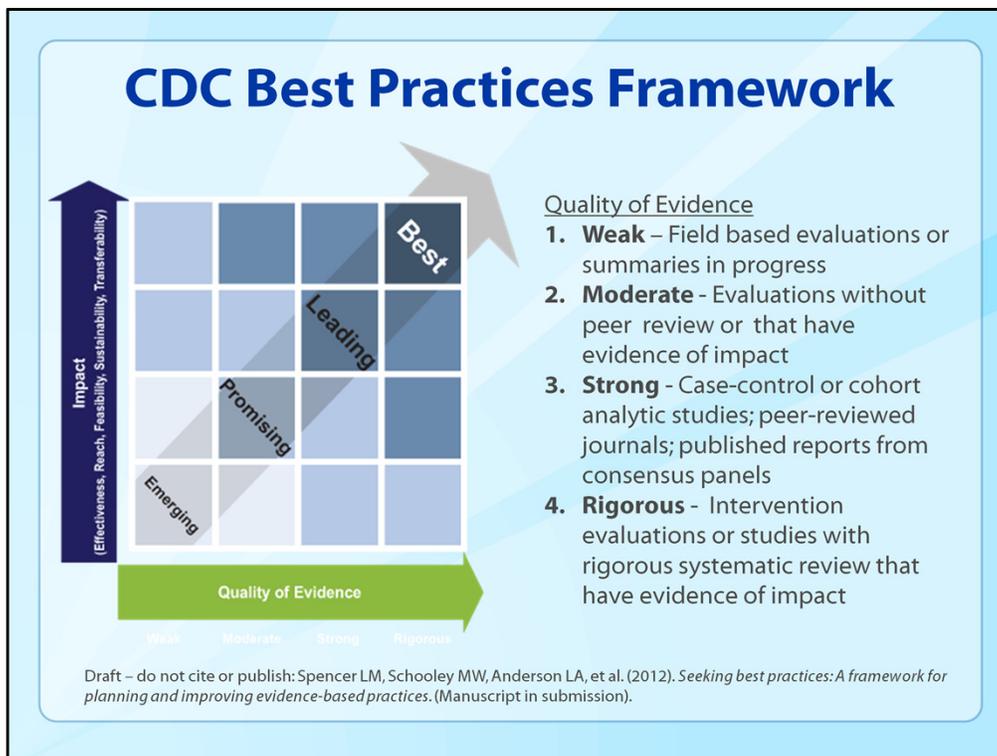
Parachutes reduce the risk of injury after gravitational challenge*

*effectiveness has not been proved with randomized controlled trials



Smith GCS, Pell JP. Parachute use to prevent death and major trauma related to major gravitational challenge: systematic review of randomized controlled trials. *BMJ* vol 327, Dec 2003.

To illustrate this idea a little bit more, this is an example of how the effectiveness of parachutes has not been driven through randomized control trials. As in many of your programs, it's not always feasible to use randomized control trials, and this is just kind of poking fun at that idea.

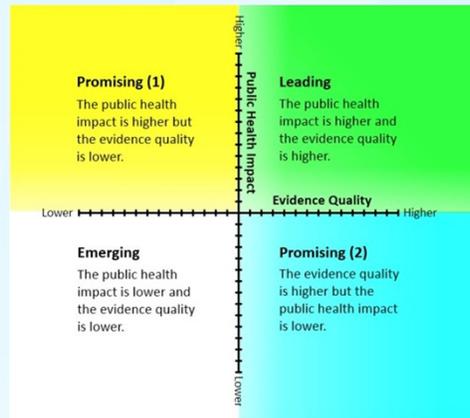


I'd like to go into a few frameworks to help guide you in identifying credible sources of evidence. And this one is currently in development. The CDC is developing a best practices framework to help guide different agencies and across different public health fields. And one of the goals of this framework is to help identify and generate practice-based evidence, especially in emerging fields where there may not a wealth of practice-based evidence out there.

If you look at image on the screen, it shows the continuum of determining best practices on the vertical axis. It looks at impact, including effectiveness, which is the extent to which the practice achieves the desired outcomes. It looks at reach, feasibility, sustainability, and transferability, which is the extent to which a practice can be applied or adapted across a variety of context. And all across the horizontal axis is the quality of evidence, which can range from weak to rigorous.

Weak includes field-based evaluations or summaries in progress, such as abstracts and book chapters without review; moderate, which include evaluation without peer-review of practice, such as evaluation reports; strong, which are more typically experimental designs, like case control studies, or evidence from peer-reviewed journals; and rigorous, which includes intervention, evaluations, or studies with rigorous systematic review that have evidence of impact, such as meta-analyses. I'd just like to reiterate the point that is all in a continuum, and you can't really gauge quality of evidence without looking at the other axis and impact for identifying best practices to inform your programs.

Framework to Assess Evidence Quality & Impact

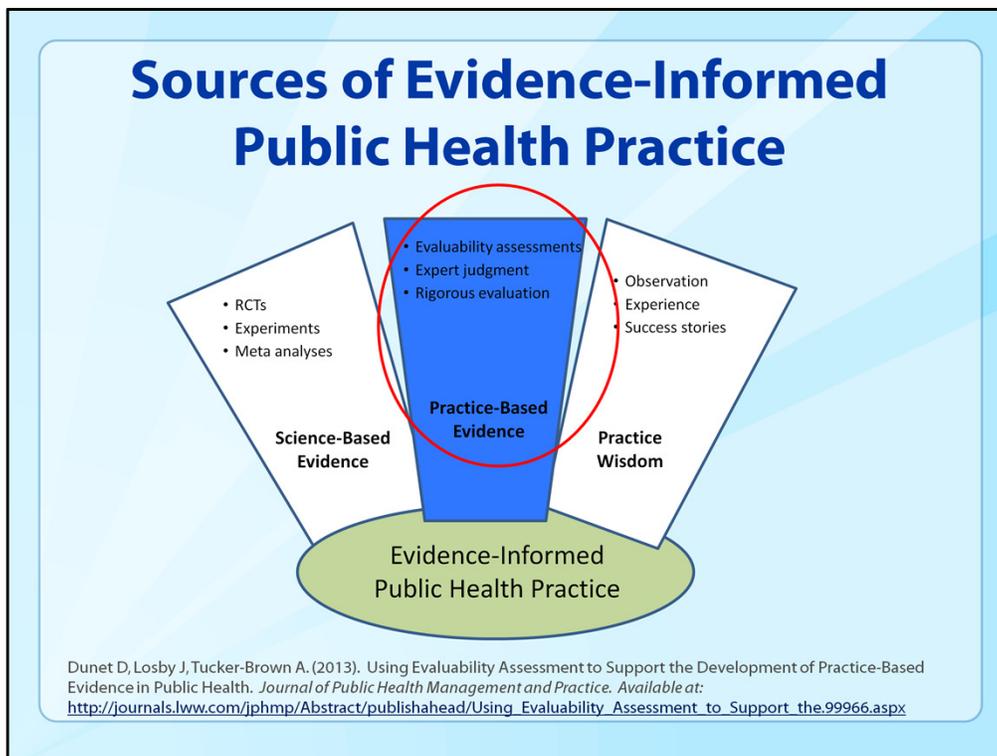


Evidence Quality

1. **Study design** – Scientific Rigor
2. **Source** – Level of credibility
3. **Practice and Theory Basis** – Based off of published evidence
4. **Research Basis** – Based off published research

Draft – Do not cite or publish: Barbero, C, Gilchrist, S, et al. *Policy Framework for Assessing Evidence Quality and Public Health Impact.* (In development).

Here’s another framework that is being developed by some colleagues here at the Division for Heart Disease and Stroke Prevention. It hasn’t been published yet, but it touches upon the same ideas as the best practices framework, and it looks at public health impact and evidence quality for identifying promising, leading, emerging, and leading policies for public health. And for evidence quality they’re working on a tool to help assess the quality of evidence for making policy decisions. And these include, study design, which looks at scientific rigor; sources of evidence, which looks at the level of credibility of the evidence; practice and theory basis looks at how published evidence identifies and looks at the practice and theory basis; and research basis, which looks at how much of the evidence is based on published research.



The last framework I'd like to go into today was also published by colleagues here at the Division for Heart Disease and Stroke Prevention. They developed a framework looking at sources of evidence, and it's particularly helpful in developing viability assessments. They framed sources of evidence into three categories. They have science-based evidence, which includes rigorously conducted studies, like the randomized-control trials, and peer-viewed scientific literature. These are the more experimental types of evidence I mentioned previously. And the other two are the non-experimental types of evidence, including practice wisdom, which is expertise of public health practitioners who draw upon their experience to develop, improve, or adapt practices. This is especially helpful when public issues cannot wait for the completion of scientific studies, or scientific studies would not be feasible or ethical. You can think back to the parachute example. This is collected through observation and experience.

Practice-Based Evidence

- Adaptation of scientifically proven strategies
- Innovations based on expert judgment
- Unique practice formed by real world factors (e.g., communities of practice)



The other one that I want to focus on for the rest of the day is practice-based evidence. These can include formal evaluation, like viability assessments, expert judgment, and rigorous evaluations. I'd like to note that the range of rigor in the evaluation designs can depend on the context, evaluation questions, and the stakeholders.

Where does practice-based evidence come from? It can be from novel adaptations of scientifically proven strategies, innovations based on expert experiences, and unique practices formed by real world factors, which can be influenced by bureaucracy, political/social issues, and based on current public health interest. An example of collecting practice-based evidence can be from communities of practice. These are especially helpful in emerging fields of science where there is not an abundance of published evidence-based research.

CDC Case Example

Project Goal

Reduce sodium intake across populations through sustainable strategies that increase access to and availability of lower sodium foods

CDC funded six communities that include various types of venues

- Restaurants, private businesses
- Hospitals, nursing homes
- Schools, government agencies
- Grocery stores, convenience stores

And for the CDC example of the day, I'd like to highlight this Sodium Reduction in Communities Program, which incorporates communities of practice.

In today's example, the overall project goal is to reduce sodium intake across populations through sustainable strategies that increase access to, and availability of lower sodium foods. The CDC funded six different communities of practice all with the same goal; however, they each worked in several different types of food venues, which included restaurants, private businesses, hospitals, schools, and stores. I'd just like to highlight that each one of these, although they have the same goals, because of their different venues they had different stakeholders and different evaluation questions. They each had different sources of evidence.

CDC Case Example

Types of Stakeholder

Food distributors, consumers, owners/management & employees

Evaluation question & source of evidence

- What are the procurement practices?
 - Key informant interviews (cooking methodology)
 - Environmental scans (pantry inventory)
- How receptive are customers in purchasing and/or consuming lower sodium meals?
 - Consumer feedback (taste testing by school children)
- How are business sales affected?
 - Sales data
- How much is sodium reduced through changes in meal preparation?
 - Nutritional analysis

The type of stakeholders that they worked with include food distributors, who helped influence the variety of food available in bulk and the cost of lower sodium foods; consumers, who need to adopt the program strategies; and owners and managers of the food venue establishments, and the employees who are responsible in implementing several of the sodium reduction strategies.

These are some example evaluation questions, and the source of evidence to answer them: What are the procurement practices of that venue? For example, this was answered through key informant interviews, especially in the restaurant venues asking the managers and staff what was there cooking methodology, and ferreting out ways to incorporate lower sodium strategies into their current cooking methodology. They also include environmental scans. This was done in one instance through a pantry inventory to identify the sodium content of their major pantry items.

When looking towards customers the question was, how receptive are customers in purchasing and/or consuming lower sodium meals? This is done through a variety of consumer feedback based on venues, including surveys and by taste testing by school children in the school setting.

How are businesses' sales affected? This was important for restaurants and grocery stores. This was answered through sales data. And you can look at what type of menu items increased or decreased, and also sales data for lower sodium foods. Did it go up, did go down, what the strategy effective?

And also how much of the sodium reduced through changes in meal preparations? When restaurants implement these strategies, how much does the sodium content actually reduce? This was answered through a nutritional analysis. These are just a couple of examples of how your stakeholders in a venue, and evaluation questions influence the type of sources of evidence you may collect.

CDC Case Example

- Program + evaluation move together in real time
- Evaluation – Builds evidence in emerging fields
 - Communities identify and share evaluation approaches, sources of evidence, & data collection strategies
 - Varying levels of rigor in evaluation designs
 - On-going refinement of outcomes & measures
- Dissemination commitment = explicit goal of expanding evidence of community-based strategies to reduce sodium
 - Necessary to build evidence in emerging fields

Through these communities of practice, the program interventions and evaluation move together in real time. The evaluation helped inform the programs on what was working, and what wasn't. The communities share their evaluation and approaches with each of other, their sources of evidence, and how they're collecting the data. In each instance the level of rigor may have differed, and it was dependent on the evaluation design and each venue and community level. And it was continuously refined as more realistic outcomes became feasible and the measurement was refined. Important in these communities of practice, and in your own work is to make sure that you disseminate your findings, because disseminating and sharing your findings of lessons learned and successful strategies helps build a practice-based evidence out there, especially in emerging fields.

In Summary

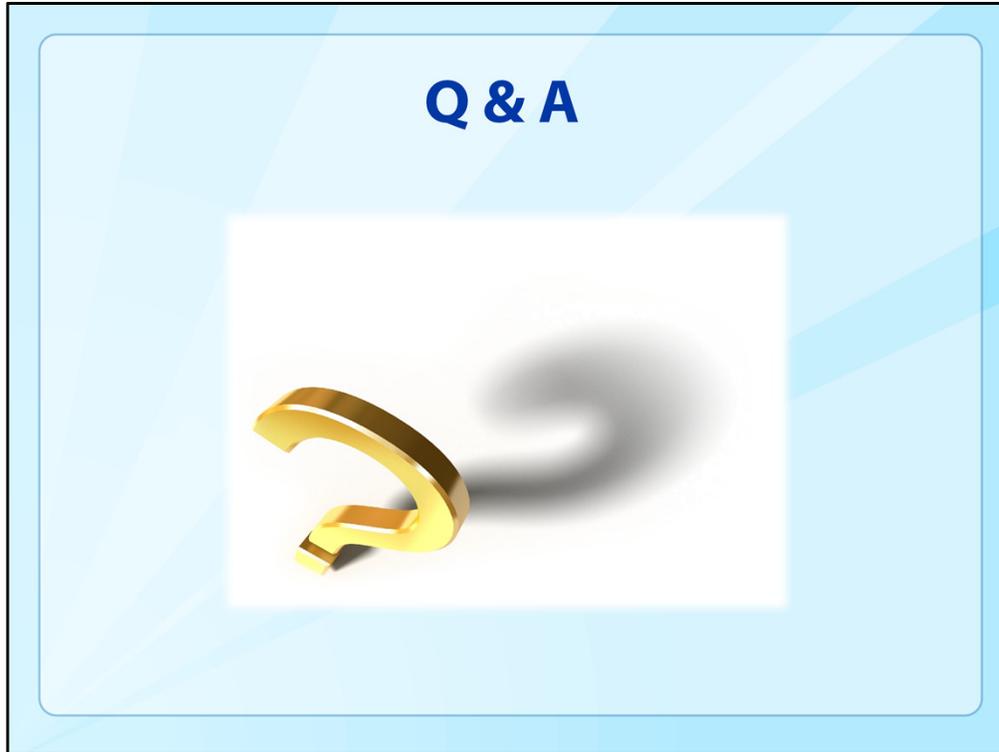
- Use evaluation questions to guide the type of evidence to collect
- Collect meaningful evidence (quantitative and qualitative)
- Utilize stakeholders to prioritize most credible sources of evidence
 - Stakeholders can also be a source of evidence
- Confirm that all sources of evidence are replicable, observable, credible, and verifiable

In summary of what counts as evidence, and how to determine what's credible evidence, it's important to use your evaluation questions to guide the type of evidence you collect. It's also important to collect meaningful evidence—whether this is in the form of experimental designs, quantitative data, or qualitative data. Make sure to use your stakeholders in order to prioritize what's the most credible sources of evidence and the most important evaluation questions to answer. Also remember that your stakeholders can be a source of evidence in themselves. Lastly, confirm that all sources of evidence are replicable, observable, credible, and verifiable.

References and Resources

- ❑ Puddy, R. W. & Wilkins, N. (2011). *Understanding Evidence Part 1: Best Available Research Evidence. A guide to the Continuum of Evidence Effectiveness*. Atlanta, GA: Centers for Disease Control and Prevention.
 - ❑ Interactive website: <http://vetoviolenecdc.gov/evidence/#panel1-1>
- ❑ *What Counts as Credible Evidence in Applied Research and Evaluation Practice?* ed: Donaldson, Christie, Mark; Sage 2009.
- ❑ Dunet D, Losby J, Tucker-Brown A. (2013). Using Evaluability Assessment to Support the Development of Practice-Based Evidence in Public Health. *Journal of Public Health Management and Practice*. Available at: http://journals.lww.com/jphmp/Abstract/publishahead/Using_Evaluability_Assessment_to_Support_the.99966.aspx
- ❑ Brownson, Chiqui, Stamatakis. Understanding evidence-based public health policy. *American Journal of Public Health*. 2009;99(9); 1576-83.
- ❑ CDC Sodium Reduction in Communities website: www.cdc.gov/salt

Here's a list of some tools for you guys to look into further if you're interested. I'd like to note that at the bottom of the page is the Sodium Reduction in Communities web site if you'd like to learn more about the evaluation approaches taken in those communities of practice.



Question 1: You presented three different approaches or frameworks for evidence. As a state grantee, which approach would you recommend for them? Do they use one over the other? What are your thoughts on that?

Response: Great question. Kind of like the question of the day, what counts as evidence? That really depends. So I really suggest looking over all three of them. The best practices one, and the policy one has not been published yet, but I do, I do really recommend looking them over. For the time being you can look at sources of evidence by Mark Bet. I think that everyone can benefit from looking at each at one, and determining what really fits your program best. The policy one may not be applicable for all of you, but you could share it with some of your key partners if they're interested in what sort of evidence is out there, how to determine what's the best evidence for moving forward with policies. And the best practices one will be a great starting point across different fields of public health.

Question 2: When the CDC recommends that we use evidence-based approaches, do they also allow us to use practice-based evidence?

Response: I think it depends. I would really work with your TA provider, or team member here to ask them. We're open to exploring different options, or project officer. I would open that line of discussion and see what has been out there. If there's some good foundation for pursuing that further. But I wouldn't hesitate in bringing that up and asking.

Thank You

**If you have any questions, comments, or
topic ideas send an email to:**

arebheartinfo@cdc.gov

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333
Telephone, 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
E-mail: cdcinfo@cdc.gov Web: www.cdc.gov

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If anyone thinks of additional questions or topics related to reporting evaluation findings or ways you would like to receive more technical assistance about this topic, please feel free to email us at the address listed on the slide.