Levels of Scientific Evidence,

with Dr. Kat

Scientific evidence can be confusing! It's easy to mistake weak evidence for strong evidence. Sometimes people share unreliable things on social media with good intentions, but sometimes they're exploiting the public's lack of understanding of different levels of evidence. We all encounter claims online, but *all evidence is not created equal.* So, how can you tell the quality? This infographic can help you find your way.

NATIONAL NEWS LITERACY WEEK

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A future founded on facts

Scan here to watch Dr. Kat lead you through this chart!

TIP **Scientific evidence in the news**

News reports and opinion pieces about scientific topics might cite a mix of different kinds of evidence. Be sure to examine what type is being presented: *Is it quoting an expert? Is it a "study"? What kind of study?* Refer back to the pyramid to evaluate the quality of evidence included. (And don't forget to check the date! If the study or date of the news report is old, the data might have changed.)

META-ANALYSIS

Statistical method that combines the results of multiple scientific studies.

Example: Connection between intelligence test scores and education.

RANDOMIZED TRIAL

The gold standard for *testing* health claims. (The top layer does not include experiments but summarizes them.) Researchers randomly assign participants to groups to make fair comparisons and test treatments in ways that minimize bias.

Example: Pfizer COVID-19 vaccine trials.

CASE-CONTROL STUDY

A study that compares a group of individuals with a specific condition to a group of people without that condition to find out what may have caused it.

Example: A study used to determine a link between smoking and lung cancer.

Don't forget! Correlation does NOT equal causation.

CASE REPORT / CASE SERIES

A study on one person (report) or one group (series) of people with similar clinical characteristics. Because these studies don't make comparisons, they aren't as strong as the evidence in higher levels of the pyramid.

Example: Interesting cases reported with no control group.

EXPERT OPINION

An educated opinion presented without data. More prone to bias. Can be useful before we have reliable data on a topic. (That said, expert opinion should shift to be evidence-based!)

Example: Nutrition opinion piece.

SYSTEMATIC REVIEW

Synthesis of all data summarized in a meta-analysis. Offers interpretation and context.

Example: Cochrane systematic review on Ivermectin for COVID-19.

COHORT STUDY

Often a large, long-term study that looks at what causes diseases in different groups (cohorts). It is not randomized.

Example: Framingham Heart Study

CROSS-SECTIONAL STUDY

A study that measures the health of a particular group of people at a particular point in time.

Example: National Health and Nutrition Examination Survey.

META-ANALYSIS AND SYSTEMATIC REVIEW

RANDOMIZED TRIAL

COHORT STUDY

CASE-CONTROL STUDY

CROSS-SECTIONAL STUDY

CASE REPORT / CASE SERIES

EXPERT OPINION

ANECDOTE

QUALITY OF EVIDENCE

A person's story about a personal experience. It appeals to emotion and is notoriously unreliable.

Example: Individual experiences shared through articles or on social media.