

Archived Information

# Evidence-Based Education (EBE)

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# Three Stories

- The university president
  - Evidence isn't relevant
- The vendors
  - What constitutes evidence isn't clear
- Teaching
  - Evidence isn't available

# What is EBE?

The integration of professional wisdom with the best available empirical evidence in making decisions about how to deliver instruction

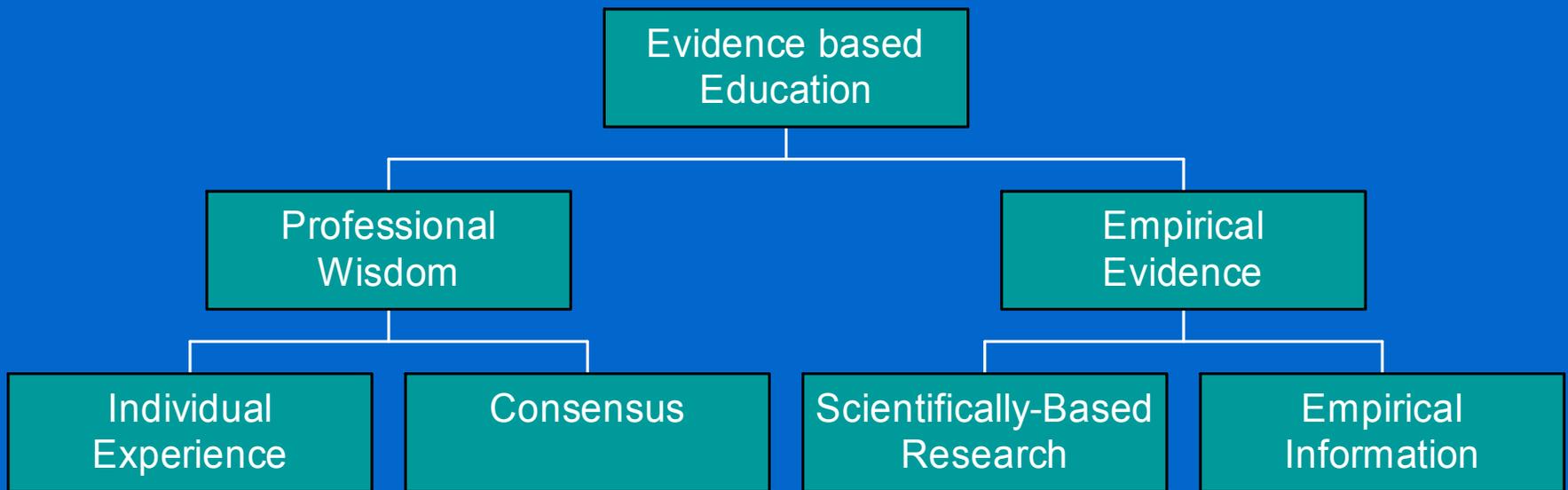
# What is professional wisdom?

- The judgment that individuals acquire through experience
- Consensus views
- Increased professional wisdom is reflected in numerous ways, including the effective identification and incorporation of local circumstances into instruction

# What is empirical evidence?

- Scientifically-based research from fields such as psychology, sociology, economics, and neuroscience, and especially from research in educational settings
- Empirical data on performance used to compare, evaluate, and monitor progress

# Evidence-based Education



# Why are both needed?

- Without professional wisdom education cannot
  - adapt to local circumstances
  - operate intelligently in the many areas in which research evidence is absent or incomplete.
- Without empirical evidence education cannot
  - resolve competing approaches
  - generate cumulative knowledge
  - avoid fad, fancy, and personal bias

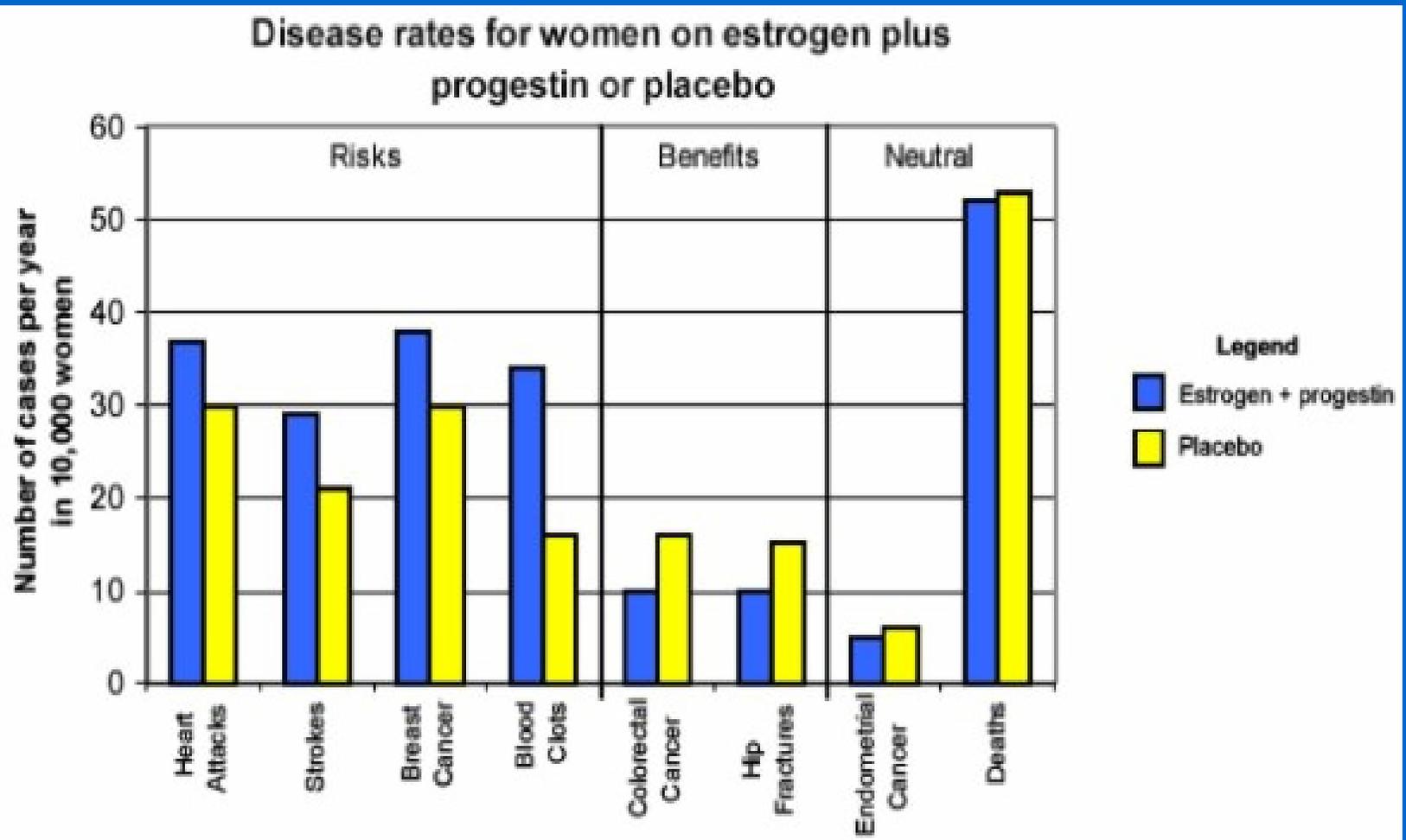
# Medicine and Ag as Models

- A little history
- Evidence-based medicine
- Examples
  - The Illinois Library
  - The FTC and diet pills
  - The Hormone Replacement Therapy Study

# The HRT Study

- Sample: 27,000+ Women, aged 50-79.
- Research Design: Women randomly assigned to receive either hormone therapy or a placebo; Data collected for 8-12 years.
- Hypothesis: HRT will reduce heart disease and fractures without increasing breast cancer

# The HRT Study



# Social Policy and ED examples

- Nurse-home visitation
- DARE
- High quality preschool
- National Reading Panel report

# Policy Requirements

- Difference in the mix of professional judgment, scientific research, and objective measures that justifies imposition of requirements contrasted with identification as good practice
- Reading research vs. math research as example

# Scientifically Based Research

“...means research that involves the application of rigorous, systematic, and objective procedures to obtain reliable and valid knowledge relevant to education activities and programs”

*(No Child Left Behind Act of 2001)*

# Scientifically Based Research

- Quality
  - To what degree does the design and analysis and logical inference support the claims and conclusions?
- Relevance
  - To what degree are the variables and circumstances similar across the research and the settings in which the research is to be applied?

# Quality: Levels of evidence

All evidence is NOT created equal

1. Randomized trial (true experiment)
2. Comparison groups (quasi-experiment)
3. Pre-Post comparison
4. Correlational studies
5. Case studies
6. Anecdotes

# Randomized Trials: The gold standard

- Claim about the effects of an educational intervention on outcomes
- Two or more conditions that differ in levels of exposure to the educational intervention
- Random assignment to conditions
- Tests for differences in outcomes

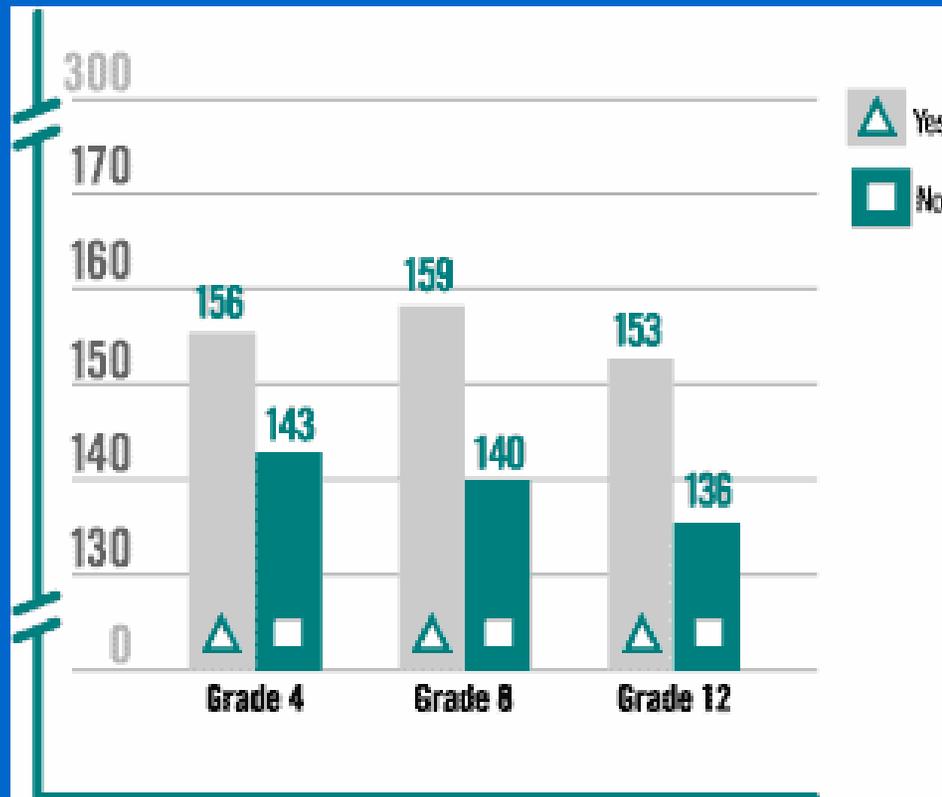
# Why is randomization critical?

- Assures that the participants being compared have the same characteristics across the conditions
- Rules of chance mean that the smart, motivated, experienced, etc. have the same probability of being in condition 1 as in condition 2
- Without randomization, differences between two conditions may result from pre-existing difference in the participants and subtle selection biases

# Why is randomization critical?

Without randomization, simple associations such as between internet use and science grades have many different interpretations

Average science scores by students' reports on use of the Internet at home





# Relevance

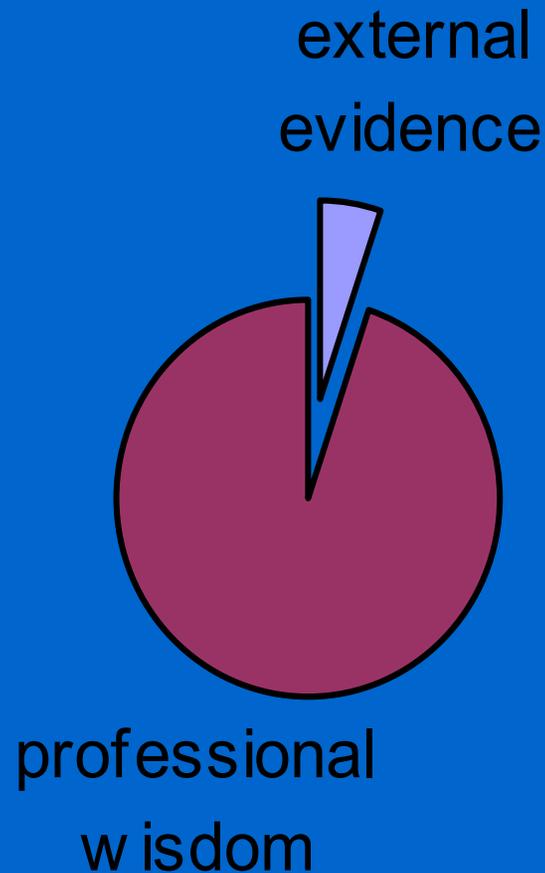
- Does the study involve a similar intervention and outcome to those of interest?
- Were the participants and settings representative of those of interest?



# Evidence will not make the decision

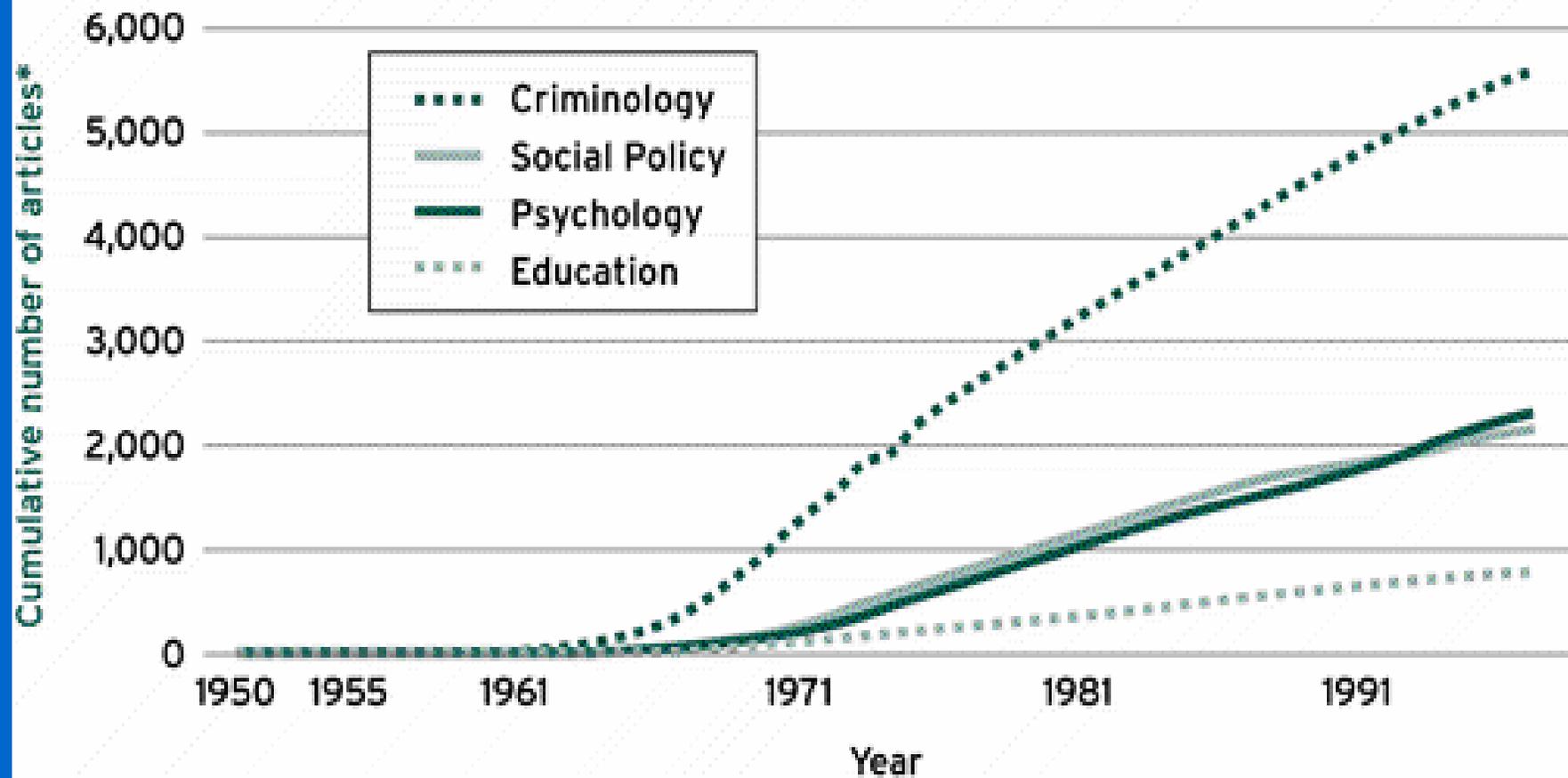
- Be skeptical
- Consider other ways of achieving goal
- Consider consequences and local circumstances
- Consult with experts who understand evidence before making costly decisions (This is different from consulting authorities who may know the subject area but not rules of evidence)

# EBE -- Where are we?



# Education Lags Behind (Figure 1)

*While the total number of articles about randomized field trials in other areas of social-science research has steadily grown, the number in education research has trailed behind.*



\* Articles about definite and possible randomized field trials.

**SOURCE:** Robert Boruch, Dorothy de Moya, and Brooke Snyder, 2001

# What ED will do

- The What Works Clearinghouse ([w-w-c.org](http://w-w-c.org))
  - interventions linked to evidentiary support
  - systematic reviews
  - standards for providers of evaluations, and list of evaluators who have agreed to follow those standards

# What ED will do

- The National Center for Education Evaluation
  - Well designed, timely, & nonpartisan evaluations of ED's own programs
    - Funding streams
    - Specific interventions
  - Funding for development and evaluation of interventions in the field
  - Feedback into discretionary grant programs

# What ED will do

- Internal review of ED's own products
- Build capacity in the field
  - Professional training
  - Workshops for major decision makers
- Systematic and long-term research programs to fill gaps

# Goals

- ED will provide the tools, information, research, and training to support the development of evidence-based education
- The practice of evidence-based education will become routine
- Education across the nation will be continuously improved
- Wide variation in performance across schools and classrooms will be eliminated