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What Is Evidence?

Basics of Evidence Brief #1

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October 2021

Emphasis on using evidence in federal policymaking and implementation is increasing, especially since the Foundations for Evidence-Based Policymaking Act of 2018 (Evidence Act) passed.[1] It is important to find, build, share, and appropriately apply evidence. In this brief, we explore the purposes and potential uses of evidence and discuss what makes good evidence in federal policy and practice.

During his first days in office, President Biden prioritized trust in research, science, and evidence when he issued an executive order on "Restoring Trust in Government Through Scientific Integrity and Evidence-Based Policymaking."[2] Since then, the US Office of Management and Budget (OMB) and several other agencies have released guidance on evidence and its use, including OMB M21-27.[3] The Evidence Act, the executive order, and recent guidance documents constructively heighten attention to different types and uses of evidence.

Types and Sources of Evidence

Evidence comes from various sources, and each can be useful for different purposes. It often also makes sense to use multiple types of evidence together in complementary ways to inform the decisions and actions of governments, for-profit and not-for-profit organizations, and individuals.

Useful evidence comes from many sources, including the following.

Administrative Data

- Program activity information and other administrative data
- Program, management, and professional experiences
- Observational monitoring

Performance Indicators

- Cost and expenditure data and analysis
- Performance metrics on programs, agencies, delivery partners, and regulated parties

Evaluation and Research

- Evaluation results
- Survey data (e.g., census, household, participant feedback)
- Statistics, data analytics, and other types of appropriately rigorous quantitative research
- Organizational, management, and implementation analysis
- Literature reviews, syntheses, and meta-analyses systematically reviewing and synthesizing a body of prior research on a topic

Using Multiple Types of Evidence Together

Using multiple kinds of evidence together—administrative data, performance indicators, formal evaluations, and program and agency experience—tends to provide a rich sense of which parts of a program work well, which work better than others, and which need attention. Using multiple kinds of evidence together also sheds light on opportunities for improvement by illuminating possible reasons for different levels of results in the same and different situations:

- Programs managers might supplement indicators for **ultimate outcomes** of interest, such as water quality, traffic fatalities, and health data, with **intermediate outcomes**, such as permitted and unpermitted releases into each measured water body, seat belt use and distracted driving data, and vaccination rates.

- Program administrators might also want to **complement ultimate and intermediate indicators with nongovernmental outside sources of contextual data**, such as supply and demand rates for services or commodities, to analyze trends, patterns, and relationships to government indicators.

- Agency and program managers might productively use **multiple sources of evidence**, for example, by combining ultimate and intermediate outcomes using administrative data with

insights from interviews with program participants and findings from formal evaluations of well-designed demonstrations or trials.

» **Trials and tests of innovations or program modifications** can often be easily integrated in routine operations by piloting a change in practice in one or a sample of operating locations and comparing outcomes before and after in locations with and without the practice changes.

» More **formal randomized controlled trials and evaluations** may be conducted to test the efficacy, efficiency, and equity of a new practice (or product) or to test if adaptations to existing practice produced positive impacts or performance gains.

Uses of Evidence

The Evidence Act defines evidence in the context of its purposes and uses, as well as methods:

> the collection, compilation, processing, or analysis of data for the purpose of describing or making estimates concerning the whole, or relevant groups or components within, the economy, society, or the natural environment…[and the] development of methods or resources that support these activities, such as measurement methods, models, statistical classifications, and sampling frames. [4]

Consistent with this functional and policy intent of the act, program practitioners, government officials, and policymakers need good evidence for three discrete but complementary purposes.

Three Discrete but Complementary Uses of Evidence

- Detect problems and inform where to focus attention and funding
- Find what works, what works better, and the situational differences influencing effectiveness
- Increase use of better practices, and improve or reduce use of less effective or harmful ones

1. Detect Problems and Inform Where to Focus Attention and Funding

Evidence on outcomes, risks, and costs helps federal, state, local, and tribal policymakers, as well as organizations and individuals, decide where and when to focus their attention to improve results. Evidence—for example, about the leading causes of death, demographic changes likely to affect future supply and demand of commodities or services, and sudden changes in social or environmental conditions—informs selection of long-term strategic goals and objectives as well as priorities among them.

Evidence also can inform short-term decisions to set annual goals or choose more tactical targets such as deciding delivery offices or locations, or sectors or populations on which to focus outreach or regulatory action. For example, in the context of the COVID-19 pandemic, evidence has helped policymakers understand where to focus efforts to improve public health and speed economic recovery. Evidence indicated that older people were at higher risk from the novel coronavirus, so many state and local officials chose to prioritize older residents to receive the vaccine first.[5] Evidence subsequently revealed disparities in the effective delivery of recovery treatments and prevention measures for people of color (Lopez, Hart, and Katz 2021). This, in turn, suggested the need to increase attention to finding effective ways to reduce disparities in health prevention and treatment practices.

2. Find Ways to Improve—What Works, What Works Better, and the Situational Differences Influencing Effectiveness

Evidence is also needed to find ways to improve. Evidence can help understand what works well currently or in the past and is worth trying to replicate in different places or situations in the future. In addition, evidence is needed to find ways to ensure that what worked well in the past will work even better in the future, and to find what works when no effective past practices have yet been found. Evidence is helpful not only for determining what interventions are more effective, but also what types are more efficient, equitable, and fair. In addition, evidence can be useful for finding more timely, affordable, and streamlined processes.

Multiple kinds of statistical analyses can help identify what works. For example, analyses to find positive outliers can reveal which programs, products, or providers outperform their peers. Once positive outliers are found, more evidence-gathering is needed to look for the likely reasons explaining their better performance.[6] Multivariate regression analyses can also be conducted to identify factors correlated with better outcomes, supporting the search for what worked well in the past that may be worth promoting more broadly in the future. Similarly, when correlations are found through regression analyses, analysts must work to discern which of the correlated factors, if any, can be influenced. This knowledge tees up theories of change that can be tested using well-designed trials, sometimes integrated into operations to determine if changing practices or products will produce better outcomes in other places. Policymakers and administrators also can use evidence reviews and syntheses of existing research to identify knowledge gaps that need filling to improve results.

Sometimes, programs or practices have not yet been found to make progress on important problems and opportunities, or their performance may be lagging. When this is the case, rather than automatically defund these programs, policymakers and administrators can initiate a performance-improvement strategy, continuing the program's funding and supporting deeper analysis and assessment to find ways to improve.

Again, experiences in the nation's response to COVID-19 are informative. The pandemic has increased the general public's appreciation of the need for multiple types of evidence to find ways to improve. Presumably because of the heightened media attention to data and trends, the public also has gained greater appreciation of the fact that as the body of relevant evidence grows, the findings may suggest a need for fairly rapid adjustments to policies and intervention strategies. For example, early in

the pandemic, US experts did not recommend mask-wearing for everyday use. After evidence grew showing that mask-wearing was effective at preventing the virus, experts began recommending wearing masks whenever possible.[7] There were also, though, situational differences in mask effectiveness—for example, homemade masks were found to be less effective than surgical masks and masks with more layers were found to be more effective than masks with one layer only.[8] Policy recommendations will continually shift as new evidence emerges.

In sum, multiple types of evidence can inform how policies, programs, and interventions are designed and implemented to maximize and continually improve effectiveness, cost-effectiveness, and fairness overall and in different situations.

3. Increase the Use of Better Practices and Reduce, or Improve, the Use of Less Effective or Harmful Ones

For evidence to be used and useful, it must be successfully communicated to administrators, frontline government workers, and delivery partners so they can easily find, readily access, and appropriately apply it. Analytic methods can help identify effective ways to share relevant evidence and encourage its appropriate use as well as ways to improve those evidence communication efforts. Government-sponsored research findings are most commonly communicated through curated evidence repositories, training and technical assistance material, outreach campaigns, supported evidence discussion networks and platforms, or other targeted means. Different users—such as policymakers, officials and administrators, program operators, frontline staff, the general public and advocates—may respond better to evidence communicated in different ways and through different communication channels. Thus, evidence is needed not only to determine what works and find ways to improve, but also to find ways to improve the effectiveness of communicating evidence results—in other words, how well relevant findings are reaching target audiences so they can access, understand, and appropriately apply the evidence. Similarly, evidence is needed to inform how to discourage use of ineffective or dangerous practices.

The response to the COVID-19 pandemic again provides examples of this communication challenge. Federal agencies, contractors, and researchers tested and assessed different marketing or public information strategies to identify successful approaches for increasing vaccination rates among those reluctant to get vaccinated.[9] Similarly, they can test and assess the effectiveness of efforts to reduce use of home virus remedies that do not work[10] and may even harm people.

What Makes Evidence Good?

To increase evidence quality, many federal agencies have established standards or principles that guide their approaches to conducting and using scientific research and evaluations. The principles relate to professional standards for developing evidence, collecting and analyzing information, and using evidence findings. Several agencies have formal evaluation or statistical policy principles, most typically based on five key principles (Nightingale and Scott 2018):

- **rigor:** using the highest-quality study designs, methodologies, analyses, and reports

- **relevance:** addressing issues, questions, and topics of high interest to the agency, program, stakeholders, Congress, and the current administration; and producing results that can be used to help inform improvement in programs, services, outcomes, and impacts

- **transparency:** making studies and reports available within agencies and to the public

- **independence:** ensuring studies and researchers are as objective and unbiased as possible

- **ethics:** following professional research and evaluation standards; protecting privacy and confidentiality of study participants and human subjects

By understanding the many types, uses, and qualities of good evidence, federal policymakers and program managers can improve their policies and programs and—ultimately—social, economic, environmental, and other outcomes.

Notes

[1] Foundations for Evidence-Based Policymaking Act of 2018, Pub. L. No. 115-435, 132 Stat. 5529 (2019), https://www.congress.gov/115/plaws/publ435/PLAW-115publ435.pdf.

[2] "Memorandum on Restoring Trust in Government Through Scientific Integrity and Evidence-Based Policymaking," The White House, January 27, 2021, https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/memorandum-on-restoring-trust-in-government-through-scientific-integrity-and-evidence-based-policymaking/.

[3] Shalanda D. Young, acting director of the Office of Management and Budget, "Evidence-Based Policymaking: Learning Agendas and Annual Evaluation Plans," memorandum for heads of executive departments and agencies, June 30, 2021, https://www.whitehouse.gov/wp-content/uploads/2021/06/M-21-27.pdf.

[4] 44 USC § 3561 referenced in The Foundations for Evidence-Based Policymaking Act.

[5] Abby Goodnough and Jan Hoffman, "The Elderly vs. Essential Workers: Who Should Get the Coronavirus Vaccine First?," *New York Times*, updated July 21, 2021, https://www.nytimes.com/2020/12/05/health/covid-vaccine-first.html.

[6] Anne Podolsky, "Positive Outliers: Understanding Extraordinary School Districts," Learning Policy Institute (blog), July 25, 2019, https://learningpolicyinstitute.org/blog/positive-outliers-understanding-extraordinary-school-districts.

[7] Marie Fazio, "How Mask Guidelines Have Evolved," *New York Times*, updated July 9, 2021, https://www.nytimes.com/2021/04/27/science/face-mask-guidelines-timeline.html.

[8] "EPA Researchers Test Effectiveness of Face Masks, Disinfection Methods against COVID-19," US Environmental Protection Agency, April 5, 2021, https://www.epa.gov/sciencematters/epa-researchers-test-effectiveness-face-masks-disinfection-methods-against-covid-19.

[9] "COVID-19 Vaccine Confidence Rapid Community Assessment Guide," US Centers for Disease Control and Prevention, February 2021, https://www.cdc.gov/vaccines/covid-19/vaccinate-with-confidence/rca-guide/downloads/CDC_RCA_Guide_2021_Tools_AppendixG_InterventionTables-508.pdf.

[10] Amy Maxmen, "Desperate for COVID Care, Undocumented Immigrants Resort to Unproven Drugs," *New York Times*, June 20, 2021, https://www.nytimes.com/2021/06/20/health/covid-drugs-peptide-vitamins.html.

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Acknowledgments

The views expressed are those of the authors and should not be attributed to the Urban Institute, its trustees, or its funders. Funders do not determine research findings or the insights and recommendations of Urban experts. Further information on the Urban Institute's funding principles is available at urban.org/fundingprinciples.