Responsible Conduct of Research

Glossary

Analysis

The careful study of research findings to look for trends, patterns or other evidence that will answer your research questions. It is important to note that in some fields an outcome of “no findings” is important and should be analyzed and reported.

Artificial intelligence (AI)

Simulation of human intelligence using machines designed to think and act like humans. Most questions about the responsible use of AI in research stem from the use of generative AI, i.e. the use of machines to generate text, data, images, and other new information.

Author

The creator or originator of a work, who accepts responsibility for its content and meaning

Basic research

Research that seeks fundamental knowledge without any anticipation of immediate benefits or risks. For example, planetary research expands our understanding of the solar system but has no immediate practical benefit.

Best practices

Practices that are widely and often formally adopted by professionals in a field of research as the proper and most reliable way to conduct research.

Commonly accepted practices

Practices that many or most researchers accept as necessary to be a successful researcher.

Confirmation bias

The natural human tendency to select data that support the conclusions you would like to reach.

Conflict of interest

A situation in which different interests could be or are at odds with one another.

Cost sharing

A requirement in research grants that one or more institutions benefiting from the grant contribute some of their own funds to the cost of the research.

Curb-stoning

The deliberate fabrication of data by fieldworkers, such as interviewers, to save time and effort. Researchers who rely on others to collect field data should be aware of the statistical tools available to detect curb-stoning.

Data

Information collected during research investigations, experiments, or studies. Data can include quantitative measurements, qualitative observations, and information in other formats, such as text, images, or audio**.** In many fields, data are simply referred to as “research information.”

Dual-use research

Research that could be used in beneficial or harmful ways, usually referred to as dual-use research of concern (DURC).

Exempt human participant research

Research that poses minimal risk to participants and meets specific criteria, allowing it to bypass full institutional review board (IRB) review while still ensuring ethical oversight.

Export controls

Legal measures taken to protect various national, economic, security, military, or health interests. Controls on the export of some materials, technologies, and information by national governments apply to research. These items can include physical objects (components, products, or physical resources) and/or intangible research (knowledge, data, intellectual property (IP), or intellectual assets).

Freedom of Information Act (FOIA)

A law that grants the public the right to access federal agency records, which could include information in federally funded grants. States also have freedom of information laws.

Ghost author

An author who made substantial contributions to the manuscript (such as a funder) but is not listed as an author. This practice is used to hide participation by authors with particular interests, such as industry and public action groups.

Government requirements

Legally enforceable rules, regulations, standards, policies, or obligations established by government authority that organizations and individuals must follow.

Honorary, gift, or guest author

An individual who is listed as an author but does not qualify for authorship.

Human participants or subjects

Individuals who participate in or who are the subjects studied in research projects. Historically, individuals were seen as the "subjects" of studies and referred to as "human subjects." This term is still used in the main legislation governing research with humans (the Common Rule). Today, the term "participant" is increasingly used to emphasize the active and voluntary role of those participating in a study.

Hype

Exaggeration of claims surrounding research findings beyond what evidence supports.

Identifiable information

Information that can be linked to specific individuals, such as names, contact details, or any characteristics that allow for the identification of participants in research.

Impact factor (journal)

A measure of a journal's importance based on estimates of how often its articles are cited by others.

Impact factor (personal)

A measurement of an individual researcher's influence based on the number of their publications and how frequently they are cited.

Independent digital time stamp

Evidence of the time and date when the digital information contained in a research record was created and last amended. This evidence is stored by an independent provider to prevent it from being tampered with.

Institutional review board (IRB)

A committee that reviews and approves research involving human participants to ensure ethical standards, participant safety, and compliance with the Common Rule, institutional policies, and other regulatory guidelines.

Intellectual property (IP)

Creations of the mind or intellect, such as inventions, literary and artistic works, and images.

Inventor

The person who discovers or originates an idea that, through research and development, becomes a patentable “invention.” Legal definitions of these terms vary from country to country. Before you assume that you have “invented” an idea that might be patentable, you should check with your intellectual property office/officer.

Mentor-mentee

A relationship between two individuals where one provides mentorship and guidance to the other. In an academic context, a common example is the relationship between a supervisor and their supervisee. If you are doing a research degree or are employed to work on a specific project, you may have a formal supervisory arrangement with a senior colleague (who would be your primary mentor). However, in many cases, supervision is more informal; you could, for example, have multiple mentors who support you with different aspects of your research or career.

Mentoring

An experienced researcher (mentor) guiding, advising, and supporting someone with less experience (mentee) during career development. Dissertation/thesis advisors mentor their students (mentees), postdoctoral advisors mentor postdoctoral students, and so on.

Mentorship

The term used to identify the component of a professional researcher’s career devoted to mentoring and the systems and programs that support mentoring.

Open access publication

Making research findings freely accessible online to the public, allowing anyone to read, download, and share them without financial, legal, or technical barriers.

P-value

A measurement used to understand the significance of results. It shows how likely the same results or outcomes would be under normal circumstances, i.e. if there had been no intervention—the "null hypothesis." A low p-value suggests strong evidence against the null hypothesis and supports the assumption that the results are the consequence of some intervention or treatment.

P-hacking

The practice of manipulating data analysis until statistically significant results are achieved, by selectively weighing and reporting data.

Papermill

A company or site that produces and sells academic papers, using artificial intelligence, plagiarized materials, and other devious devises.

Peer review

The evaluation of professional publications, grant applications, and credentials by professionals of similar status to verify that the publications, grant applications, and work meet professional standards. Peer reviews can be open (the names of both parties are revealed), single blind (only one party, usually the reviewer, knows the identity of the other), or double blind (neither party knows the identity of the other).

Personal data

Data that can be used to identify a living person.

Plagiarism

Using someone else's words or work without providing appropriate credit.

Definitions of plagiarism sometimes include the theft of ideas. However, ideas cannot be owned, and two people can come up with the same idea independent of each other. We have, therefore, not included ideas in our definition, although we recognize that some do consider using someone else's idea without giving credit to be plagiarism.

Pressure to publish

Used here to refer to institutional and professional expectations for rapid and frequent publication, as opposed to the personal factors that motivate a researcher to publish.

Protocol

A pre-approved plan, often involving a repeated element that needs standardization. For example, multiple research participants might be undergoing the same tests, or you might need to specify how a routine laboratory procedure, such as Western blotting, will be carried out.

Qualitative data

Findings recorded as words, images, or sounds (e.g. photographs of paintings, passages where an author discusses a particular topic, or archival records documenting past events).

Quality improvement studies

Studies that systematically evaluate and seek to enhance healthcare practices, processes, or outcomes, focusing on improving efficiency, effectiveness, and patient safety rather than generating generalizable knowledge.

Quantitative data

Findings recorded in numerical form (e.g. the weight or size of an object, or the number of individuals who answered “yes” or “no” on a survey).

Questionable research practices

Practices that may compromise the integrity, trustworthiness, or quality of research and that range in severity from poor scientific practices that might be unintentional to behaviors that border on misconduct.

Replication

The act of repeating a research study to determine whether its basic findings are reproducible in alternative circumstances and situations.

Research agreement

A document outlining the terms, responsibilities, and rights of parties involved in a research project, including funding, intellectual property, and publication rights.

Research governance

Activity concerned with ensuring that researchers, staff, and students adhere to laws, regulations, and both national and local policies and guidance when conducting research activities.

Research integrity

The adherence to professional practices, ethical behavior, and the principles of honesty and objectivity when conducting, managing, using the results of, and communicating about research and research activities. Inclusivity, transparency, and protection from inappropriate influence are hallmarks of research integrity. (Source*:* Adapted from *A Framework for Federal Scientific Integrity Policy and Practice,* substituting "research" for "scientific.")

Research impact

Research impact, also referred to as "broader impacts," is the effect research will have on society beyond just advancing knowledge. Will the advance in knowledge lead to improvements in healthcare, solutions to climate change, new technologies, improved education, or other societal benefits?

Research misconduct

Fabrication, falsification, or plagiarism (FFP) in proposing, performing, or reviewing research, or in reporting research results.

Research plan

A document that outlines the objectives, methodology, timeline, and resources for a study, guiding researchers in systematic investigation and the collection of information or data.

Research data management plan

A plan that details the procedures for collecting, storing, analyzing, and sharing research data, ensuring proper organization, security, and compliance with institutional and funding requirements.

Research management plan

A plan that outlines the strategies, resources, and timelines for organizing, conducting, and overseeing research activities, ensuring efficient execution and adherence to goals and regulations.

Research record

A secure, lasting, step-by-step account of work undertaken, including findings, observations, and notes that are detailed enough to allow other researchers to replicate your research and evaluate what you have done.

Respondent

The individual against whom an allegation of research misconduct is directed or who is the subject of a research misconduct proceeding. (Source: Department of Health and Human Services, Public Health Service Policies on Research Misconduct.)

Responsible conduct of research

Conducting research in a way that lives up to the duties and obligations researchers are expected to embrace. At times abbreviated as RCR.

Selection

The process of reviewing raw data and deciding which information should be used in or excluded from the interpretive process that follows.

Sponsor

A person or organization that provides financial or other support for a research project, including access to equipment, skills, and services, or public backing through news coverage and promotion.

Variable

A factor or characteristic that can be weighted and measured in a study, thereby affecting the outcome or relationship being investigated.

Whistleblower

A sporting analogy (based on a referee blowing a whistle when a misdemeanor occurs) which is used to describe someone who reports misconduct.

Acronyms

3Rs	Replacement. Reduction. Refinement.
AAALAC	American Association for Accreditation of Laboratory Animal Care
AI	Artificial Intelligence
ALLEA	All European Academies
APA	American Psychological Association
Caltech	California Institute of Technology
CDAs	Confidentiality Agreements
CIPA	Classified Information Procedures Act
COPE	Committee on Publication Ethics
CRediT	Contributor Role Taxonomy
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CT	Computed Tomography
CUI	Controlled Unclassified Information
DOAJ	Directory of Open Access Journals
DOD	Department of Defense
DOE	Department of Energy
DORA	Declaration on Research Assessment
DRP	Detrimental Research Practice
DUAs	Data Use Agreements
DURC	Dual-Use Research of Concern
EAR	Export Administration Regulations
EMCRs	Early to mid-career researchers
FFP	Falsification, Fabrication, and Plagiarism
FOIA	Freedom of Information Act
FTF	First to File
FTI	First to Invent
GCP	Good Clinical Practice
GMO	Genetically Modified Organism
GMOs	Genetically Modified Organisms
GMSC	Genetic Modification Safety Committee
HHS	Health and Human Services
HIPPA	Health Insurance Portability and Accountability Act
HRPP	Human Research Protection Program
IACUC	Institutional Animal Care and Use Committee
ICH	International Council for Harmonization of Technical Requirements of Pharmaceuticals for Human Use
IDPs	individual Development Plans

IP	Intellectual Property
IRB	Institutional Review Board
ITAR	International Traffic in Arms Regulations
LLMs	Large Language Models
MMR	Measles, Mumps, and Rubella
MTAs	Material Transfer Agreements
NARA	National Archives and Research Administration
NAS	National Academies of Science
NASA	National Aeronautical and Space Administration
NATO	North Atlantic Treaty Organisation
NDAs	Non-Disclosure Agreements
NEJM	New England Journal of Medicine
NIH	National Institute of Health
NRMN	National Research Mentoring Network
NSF	National Science Foundation
OASPA	Open Access Scholarly Publishing Association
OECD	Organization for Economic Co-operation and Development
OFAC	Office of Foreign Assets Control
OLAW	Office of Laboratory Animal Welfare
ORI	Office of Research Integrity
PHS	Public Health Service
PI	Principal Investigator
QRP	Questionable Research Practices
RCR	Responsible Conduct of Research
RECR	Responsible and Ethical Conduct of Research
SOPs	Standard Operating Procedures
SSRN	Social Science Research Network
STEM	Science, Technology, Engineering, and Mathematics
TCP	Technology Control Plan
UNESCO	United Nations Educational, Scientific and Cultural Organisation
USDA	United States Department of Agriculture
USML	United States Munitions List
OSTP	White House Office of Science Technology Policy
WIPO	World Intellectual Property Organisation