Online Ethics Center
FOR ENGINEERING AND SCIENCE

Data Management Subject Aid

Author(s)

Kelly Laas

Year

2016

Description

A short guide to some key resources and readings on the topic of data management.

Body

Scientific experiments and measurements are transformed into research data. The term “research data” applies to many different forms of scientific information, including raw numbers and field notes, machine tapes and notebooks, edited and categorized observations, interpretations and analyses, derived reagents and vectors, and tables, charts, slides, and photographs.

The accuracy of research data is extremely important as it is the basis for reporting discoveries and experimental results. The general standard of practice is to provide information that is sufficiently complete so that another scientist can repeat or extend the experiment. Given this, researchers have an obligation to keep clear, accurate, and secure records of their research data and of corresponding primary material.

Another widely-held standard is that of openness, or the sharing of data among researchers. Researchers are expected to share their data with others, including, when possible, the research materials and software that enables them to draw their conclusions. Data sharing is complicated by issues of confidentiality, intellectual property, and others, as well as technical issues such as the costs of documentation, duplication, and the transfer of data.

National Academy of Sciences, Committee on Science, Engineering, and Public Policy, Panel on Scientific Responsibility and the Conduct of Research. 1992. ***Responsible Science: Ensuring the Integrity of the Research Process.*** **Washington D.C.: National Academy Press. 47-49.**

Subject Overviews

"Data Management Practices," in ***ORI Introduction to RCR*****, Nicholas Steneck, 87-102. Office of Research Integrity, 2007.**
http://ori.hhs.gov/Chapter-6-Data-Management-Practices-Introduction

> This booklet introduces the reader to the nine RCR core instructional areas in four sections that follow research from inception to planning, conducting, reporting, and reviewing research. The publication features case studies, text-box inserts, discussion questions, and electronic and printed resources.

Margi, Joshi and Sharon S. Krag. 2010. Issues in Data Management. ***Science and Engineering Ethics.*** **16(4): 743-747.**

> Data management raises a number of issues, both regulatory and non-regulatory. Researchers should understand how data are defined by their particular institutions and regulatory authorities. Data are the bases of scientific communication and provide a strong defense against allegations of scientific misconduct. Authorization is often necessary before collection of data can commence. Proper handling, retention, and storage of data, especially that involving humans, are crucial for the researcher. Data ownership by the institution leads to a responsibility by the institution to educate all its researchers in responsible data management practices.

"The Treatment of Data," in ***On being a scientist : A Guide to Responsible Conduct in Research*** **National Academies . Committee on Science Engineering and Public Policy. 2009. 3rd ed. 8-11. Washington, D.C.: National Academies Press. http://www.nap.edu/read/12192/chapter/4**

The third edition of this publication is designed to supplement the informal lessons in ethics provided by research supervisors and mentors. The book describes the ethical foundations of scientific practices and some of the personal and professional issues that researchers encounter in their work. It applies to all forms of research -- whether in academic, industrial, or governmental settings-and to all scientific disciplines.

Policy or Guidance

National Academy of Sciences (U.S.), National Academy of Engineering., & Institute of Medicine (U.S.). 2012. *The Case for International Sharing of Scientific Data: A Focus on Developing Countries: Proceedings of a Symposium*. Washington, D.C. National Academies Press. https://www.nap.edu/catalog/17019/the-case-for-international-sharing-of-scientific-data-a-focus

The theme of this international symposium is the promotion of greater sharing of scientific data for the benefit of research and broader development, particularly in the developing world. The symposium has been co-organized by the NRC's Policy and Global Affairs Division—the Board on International Scientific Organizations (BISO) and the Board on Research Data and Information (BRDI). The Case for International Sharing of Scientific Data: A Focus on Developing Countries: Proceedings of a Symposium summarizes the symposium.

National Academy of Sciences (U.S.), National Academy of Engineering., & Institute of Medicine (U.S.). 2010. *Conducting Biosocial Surveys: Collecting, Storing, Accessing, and Protecting Biospecimens and Biodata*. Washington, D.C.: National Academy Press. https://www.nap.edu/catalog/12942/conducting-biosocial-surveys-collecting-storing-accessing-and-protecting-biospecimens-and

This report offers findings and recommendations concerning the best approaches in the Biosocial field. The topics covered include: informed consent, privacy issues and the best practice, but also additional legal, ethical, and social issues, as well as practical issues related to the storage, retrieval, and sharing of data.

National Academy of Sciences (U.S.), National Academy of Engineering., & Institute of Medicine (U.S.). 2009. *Ensuring the Integrity, Accessibility, and Stewardship of Research Data in the Digital Age.* Washington, D.C.: National Academy Press. https://www.nap.edu/catalog/12615/ensuring-the-integrity-accessibility-and-stewardship-of-research-data-in-the-digital-age

> As digital technologies are expanding the power and reach of research, they are also raising complex issues. These include complications in ensuring the validity of research data; standards that do not keep pace with the high rate of innovation; restrictions on data sharing that reduce the ability of researchers to verify results and build on previous research; and huge increases in the amount of data being generated, creating severe challenges in preserving that data for long-term use.

National Institutes of Health. 2007. “Data Sharing Policy.” In National Institutes of Health Grants and Funding. http://grants.nih.gov/grants/policy/data_sharing/index.htm

> The National Institutes of Health main policy on sharing data from research the agency funds. The agency sees this sharing as essential for expedited translation of research results into knowledge, products, and procedures to improve human health.

National Institutes of Health. 2016. “NIH Sharing Policies and Related Guidance on NIH-Funded Research Resources.” In National Institutes of Health Grants and Funding. http://grants.nih.gov/grants/sharing.htm

> A collection of policies from the National Institutes of Health that cover how research is collected and shared, including public access to data, lists of sharing repositories, and specific guidelines for genetic, biological, and other data collected through NIH funded research.

National Science Foundation. 2015.” Dissemination and Sharing of Research Results.” In National Science Foundation, Office of Budget, Finance and Award Management. http://www.nsf.gov/bfa/dias/policy/dmp.jsp

> Policy of the National Science Foundation on the dissemination and sharing of research results from NSF funded projects.

“Planning and Preparing for Research” in *Doing Global Science: A Guide to Responsible Conduct in the Global Research Enterprise*, 32-37. Princeton University Press, 2016. https://www.interacademies.org/publication/doing-global-science-guide-responsible-conduct-global-research-enterprise

> This concise introductory guide explains the values that should inform the responsible conduct of scientific research in today's global setting. It includes a section on data collection and analysis, and the sharing of data.

Rights

Use of Materials on the OEC

Resource Type

Bibliography

Parent Collection

OEC Subject Aids

Topics

Big Data
Controversies
Data Management

Discipline(s)

Research Ethics
Authoring Institution
Online Ethics Center