

Nault, R., Cave, M. C., Ludewig, G., Moseley, H. N. B., Pennell, K. G., & Zacharewski, T. (2023). A case for accelerating standards to achieve the FAIR principles of environmental health research experimental data. *Environmental Health Perspectives*, 131(6), 065001.

<https://doi.org/10.1289/EHP11484>

Definitions

- **FAIR Principles:** Guidelines to ensure data is Findable, Accessible, Interoperable, and Reusable.
- **(Meta)Data:** Data and the information about the data.
- **Environmental Health Sciences:** The study of how environmental factors affect human health.
- **Reproducibility:** The ability to repeat a study and get the same results.
- **In Vivo Experiments:** Experiments conducted in living organisms.

Key Findings

- Adoption of the FAIR principles is crucial for improving data sharing and research reproducibility.
- There are significant gaps between current data sharing practices and the FAIR principles.
- New tools and frameworks are needed to help researchers collect, manage, and share data more effectively.

Introduction

The study discusses the importance of improving data sharing in environmental health research. Researchers emphasize the need for adopting the FAIR principles to make data more accessible and usable. The goal is to enhance research quality and reproducibility by implementing better data management practices.

Main Content

Background

The FAIR principles are designed to improve how research data is shared and used. These principles are increasingly being adopted by funding agencies and research institutions to ensure high-quality, reproducible science. However, there is still a lot of work to be done to achieve widespread adoption in environmental health sciences.

Objectives

The main objective of the study is to highlight the current challenges in data sharing within the environmental health sciences and propose strategies to align with the FAIR principles. The study also aims to demonstrate the value of these strategies through a case study.

Methods

- **Data Collection:** The study examines existing efforts to improve data and metadata (meta)data collection and sharing.
- **Tools and Frameworks:** It introduces tools like the Investigation, Study, Assay (ISA) framework and the Center for Expanded Data Annotation and Retrieval (CEDAR) to aid in (meta)data management.
- **Case Study:** The study conducts a case study of in vivo data deposited in the Gene Expression Omnibus (GEO) to illustrate current practices and the benefits of the proposed tools.

Results

- **Current State:** The study found that most data sets lack the complete metadata required by the FAIR principles, making it difficult to reuse the data.
- **Improved Tools:** Using the proposed tools and frameworks improved the collection and sharing of (meta)data, making it easier to find, access, and use the data.
- **Standardization:** The study emphasizes the need for standardized reporting guidelines to ensure consistent data quality.

Conclusion

The study concludes that adopting the FAIR principles is essential for advancing environmental health research. By improving data management and sharing practices, researchers can enhance the reproducibility and reliability of their studies. The proposed tools and frameworks provide practical solutions for achieving these goals. Future efforts should focus on encouraging widespread adoption of these standards to maximize the impact of research data.

Word Count: 445

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