2023 “HRPP Innovations” Webinar Series

Human Research Protection Programs and the Open Science Movement

April 18, 2023
1:00 pm – 2:30 pm ET
Format for 2023

2023 AAHRPP Webinar Series

- **Attendee Hub**
  - Livestreamed Content
  - Live Q&A
  - Chat/Discussions

- **Webinar Sessions**
  - Three Webinars: April, July, November
  - One Attendee Hub

- **Community**
  - Continue Discussions after Webinars Conclude
  - Check Upcoming AAHRPP Events
  - Resources from Speakers

- **On-Demand Content**
  - Webinar Recordings on Hub
  - Available for the Whole Year
Chat Feature

To chat with your colleagues before and after the session, or if you have technical questions, use the “Chat” icon.
Questions

To ask questions about the topic for the presenters, please use the “Q&A” icon:
Join Us for the 2023 AAHRPP Annual Conference

Challenge and Change in Charm City
May 16-18, 2023 | Hyatt Regency Baltimore
Presenter Introductions
Sean Grant, DPhil, MSc
Research Associate Professor
University of Oregon
Benjamin Silverman, MD
Senior IRB Chair, Human Research Affairs
Mass General Brigham

2023 AAHRPP Webinar Series
Baseline Poll

• Before registering for this webinar, how aware were you of the open science movement or open science practices?
  • I am very familiar with the open science movement/practices
  • I was vaguely aware of the open science movement/practices
  • Never heard of the open science movement/practices before registering for this webinar
  • Unsure
Exploring the Intersection of Human Research Protections and Open Science Practices

Dr. Sean Grant
Research Associate Professor
HEDCO Institute for Evidence-Based Educational Practice
College of Education, University of Oregon
Acknowledgments

• Core Collaborator
  • Kathryn Bouskill, RAND Corporation

• Funding
  • Robert Wood Johnson Foundation (#74420)

• Honoraria
  • US Office of Planning, Research, and Evaluation
  • Berkeley Initiative for Transparency in the Social Sciences
### What are Open Science Practices?

<table>
<thead>
<tr>
<th>Design</th>
<th>Conduct</th>
<th>Dissemination</th>
<th>Archiving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration</td>
<td>Research Notebook</td>
<td>Transparent Reporting</td>
<td>Data Sharing</td>
</tr>
<tr>
<td>Protocol</td>
<td>Version Control</td>
<td>Preprint Sharing</td>
<td>Code Sharing</td>
</tr>
<tr>
<td>Analysis Plan</td>
<td>Dynamic Document</td>
<td>Open Access</td>
<td>Materials Sharing</td>
</tr>
</tbody>
</table>

Grant et al. (2022)
Open Science is Becoming “Normal”

OSTP Issues Guidance to Make Federally Funded Research Freely Available Without Delay

Today, the White House Office of Science and Technology Policy (OSTP) updated U.S. policy guidance to make the results of taxpayer-supported research immediately available to the American public at no cost. In a memorandum to federal departments and agencies, Dr. Alondra Nelson, the head of OSTP, delivered guidance for agencies to update their public access policies as soon as possible to make publications and research funded by taxpayers publicly accessible, without an embargo or cost. All agencies will fully implement updated policies, including ending the optional 12-month embargo, no later than December 31, 2025.
Analysis of OHRP Documents

Why institutional review boards should have a role in the open science movement

Sean Grant\textsuperscript{a,1} and Kathryn E. Bouskill\textsuperscript{b}

Open science involves the use of practices across the research life cycle that facilitate the transparency, reproducibility, and availability of scientific products and output. Prominent open science practices include registration of study protocols and preanalysis plans; materials, data, and code sharing; and publication of summary findings in open access outlets (1). To achieve openness as the default approach, initiatives are trying to use a systems approach to engage stakeholders—namely, scientific journals, funding agencies,

https://www.pnas.org/doi/10.1073/pnas.1916420116
Open Science is Relevant to IRBs

• IRBs can influence investigators’ ability to practice open science in their human subjects research
• IRBs will be impacted by move to “open” science
  • Growth in practices that influence level of review
• IRB review provides an opportunity to intervene early (and throughout) the research lifecycle
  • Potential to support open science practices by influencing researchers to consider them

Doernberg & Wendler (2016), Meyer (2018)
Survey and Interview Methods

• Approached 253 R1/R2 universities with active IRB
• Questions based on ethical principles/regulations
  • Relevance, policies, procedures, guidance, templates, expertise, and IRB oversight
• Followed by semi-structured interviews
  • Identify facilitators/barriers to enact behavior based on capability, motivation, and opportunity

Grant & Bouskill (2019), Michie (2014)
## Participant Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Survey</th>
<th>Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Size</td>
<td>132</td>
<td>33</td>
</tr>
<tr>
<td>IRB Chair</td>
<td>78%</td>
<td>64%</td>
</tr>
<tr>
<td>Certified Professional</td>
<td>17%</td>
<td>24%</td>
</tr>
<tr>
<td>Electronic System</td>
<td>84%</td>
<td>82%</td>
</tr>
<tr>
<td>Evaluate Clinical Trials</td>
<td>61%</td>
<td>58%</td>
</tr>
<tr>
<td>Accredited Program</td>
<td>53%</td>
<td>33%</td>
</tr>
</tbody>
</table>
Relevance of Open Science Practices: Declaration of Helsinki

• We would like to know the extent to which you agree or disagree with the following statements:
  
  • Every research study involving human subjects must be registered in a publicly accessible database before recruitment of the first subject.
  
  • Researchers have an ethical obligation to make publicly available the results of their research on human subjects.
Relevance of Open Science Practices: Belmont Report

• Investigators have an obligation to make sure that subjects adequately comprehend risk of breaches in confidentiality

• The products of publicly-funded research should be made publicly available in as open a manner as possible.
Relevance of Open Science Practices: Belmont Report

• When results of a research study are not publicly available...
  • Benefits to society (generalizable knowledge to be gained from research) are lost
  • IRB ability to accurately estimate the probability of harm or benefit of future studies is impaired
Relevance of Open Science Practices to Official Ethical Principles

- Comprehension of Information about Risks
- Publicly-Funded Research
- Anticipated Benefit to Society
- Publication/Dissemination of Results
- Estimating Probability of Harm or Benefits
- Research Registration

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Proposed, Verifying, and History of Use of Open Science Practices

- **Proposed use (45 CFR 46.109: IRB Review of Research):** explicitly ask investigators to describe whether they plan to use an open science practice

- **Verifying use (45 CFR 46.109: IRB Continuing Review of Research):** among IRBs that ask about an open science practice, explicitly verify that plans have been followed

- **History of using (45 CFR 45.115: IRB Records):** IRB considers an investigator's history of implementing open science practices in previous studies when reviewing a new study submission
Ask Investigators about Open Science Practices

- Data Sharing
- Results Sharing
- Study Registration
- Materials Sharing
- Code Sharing
- Protocol Sharing

Legend:
- Yes for all new submissions
- Only for some types of new submissions
- No
Verifying Use of Open Science Practices

- Study Registration
- Materials Sharing
- Protocol Sharing
- Results Sharing
- Data Sharing
- Code Sharing

- Yes for all new submissions
- Only for some types of new submissions
- No
History of Using Open Science Practices

- Data Sharing
- Study Registration
- Results Sharing
- Materials Sharing
- Protocol Sharing
- Code Sharing

Legend:
- Yes for all new submissions
- Only for some types of new submissions
- No

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Guidance and Templates on Specific Open Science Practices in Regulations

- **Exempt Research** (§46.104(d)(2)-(4)): how to record information so identity cannot readily be ascertained

- **Non-Exempt Research** (§46.111(a)(7)): how to share data with adequate provisions to protect privacy/confidentiality

- **Confidentiality of Records** (§46.116(b)(5)): informed consent language on extent to which confidentiality will be maintained
Guidance and Templates on Specific Open Science Practices in Regulations

- **Future Research Use (§46.116(b)(9)(i))**: informed consent language on future research use of de-identified data

- **Broad Consent (§46.116(d))**: example broad consent form as alternative to traditional informed consent
Guidance and Templates for Sharing Data

- Broad Consent
- Future Research Use
- Exempt Research
- Confidentiality of Records
- Non-Exempt Research

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IRB Members and Consultants with Expertise in Open Science Practices

• **Identifiability of Private Information and Biospecimen (§46.102(e)(7)(i)(ii))**: through data matching, re-identification, and analytic technologies/techniques that generate identifiable data

• **Community Attitudes toward Data Sharing (§46.107(a))**: “sensitivity to community attitudes” as an important qualification to promote respect for IRB advice and counsel in safeguarding subjects

• **Requirements for Registering and Reporting Clinical Trials (§46.107(a))**: ascertain the acceptability of proposed research in terms of other applicable regulations/laws
IRB Consultants for Open Science Practices

- Identifiability of Private Information and Biospecimen
- Requirements for Registering and Reporting Clinical Trials
- Community Attitudes toward Data Sharing

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Oversight, Accreditation, and Certification on Open Science

• **Office of Human Research Protections**: authoritative guidance for IRBs on open science practices

• **Association for the Accreditation of Human Research Protection Programs**: incorporate standards into accreditation on open science practices

• **Public Responsibility in Medicine and Research**: incorporate competencies on open science practices in the Certified IRB Professional program
IRB Expertise in Open Science Practices

Requirements for Registering and Reporting Clinical Trials

Community Attitudes toward Data Sharing

Identifiability of Private Information and Biospecimen
OHRP Guidance on Open Science Practices

- Data Sharing
- Results Sharing
- Materials Sharing
- Study Registration
- Code Sharing
- Protocol Sharing

Critical | Important but Not Critical | Not Important

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AAHRPP Standards on Open Science Practices

Data Sharing
Results Sharing
Study Registration
Code Sharing
Materials Sharing
Protocol Sharing

Critical | Important but Not Critical | Not Important

2023 AAHRPP Webinar Series
PRIM&R Competencies on Open Science Practices

- Results Sharing
- Data Sharing
- Study Registration
- Materials Sharing
- Code Sharing
- Protocol Sharing

Critical | Important but Not Critical | Not Important
# Implementation Considerations

<table>
<thead>
<tr>
<th>Theoretical Domain</th>
<th>Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation: Role and Identity</td>
<td>More likely to engage with open science practices that fit their role/identity (as perceived by self and others)</td>
</tr>
<tr>
<td>Opportunity: Environmental Context</td>
<td>More likely to engage with open science practices if recommended by key organizations (OHRP)</td>
</tr>
<tr>
<td>Opportunity: Social Influences</td>
<td>More likely to engage with open science practices if supported by professional peers (other IRBs, faculty at their institution)</td>
</tr>
<tr>
<td>Capability: Beliefs about Capabilities</td>
<td>Stronger beliefs about the capabilities of other professionals at their university to check adequacy of open scientific practices (but they could potentially coordinate this review)</td>
</tr>
</tbody>
</table>
Potential Future Directions

- OHRP to develop guidance on role of IRBs in open science
  - Recommendations (for & against) policies and procedures
- Universities to establish policy on role their IRB has (in the context of their institutional ecosystem)
  - Engage multiple stakeholders at university, particularly faculty and other research offices
- Design education and training enabled by the above
References

• Doernberg & Wendler (2016). Ensuring respect for human research participants: institutional review boards and sharing results from research. JAMA, 316(11), 1149-1150.

• Grant & Bouskill (2019). Opinion: Why institutional review boards should have a role in the open science movement. Proceedings of the National Academy of Sciences, 116(43), 21336-21338.


HRPPs and the Open Science Movement

Benjamin C. Silverman, M.D.
Senior IRB Chair, Mass General Brigham
The Awesome Potential of Open Science: Two Case Examples
Human Genome Project

• Bermuda Principles (1996-1997)
  • Primary genomic sequence should be in the public domain
  • Primary genomic sequence should be rapidly released
    • Sequences greater than 1 Kb automatically released on a daily basis
    • Finished annotated sequences released immediately to public databases
  • Coordination of sequencing efforts
    • Notification of intentions to sequence certain regions of the genome
    • Made available online
  • Patents should not be sought
  • Funding agencies urged to foster these policies
  • Encourage research and maximize benefits to society

Ahead of schedule and under budget

Successful use of the public domain

Open science is an enduring legacy of HGP

“They worked without resting and gave it away.” –Francis Collins

SARS-CoV-2 genome published online in public access database on January 10, 2020.

- Submitted to NCBI GenBank on January 5, 2020 and published January 12, 2020
- Published online in *Nature* on February 3, 2020
- Published in print in *Nature* on March 12, 2020
SARS-CoV-2 mRNA-1273 Vaccine Development

- Virus Sequence Released: Jan 10
- Phase 1 Begins: Mar 16
- Phase 2 Begins: May 29
- Phase 3 Begins: July 27
- EUA submission: Nov 30

Key dates:
- Jan 10: Virus Sequence Released
- Mar 16: Phase 1 Begins
- May 29: Phase 2 Begins
- July 27: Phase 3 Begins
- Nov 30: EUA submission

Event timeline:
- Interim analysis finds efficacy: Nov 17

Dates:
- Jun 65 days
- Jul 139 days
- Aug 198 days
- Sep 311 days
- Oct 325 days

Fauci, Harvard Medical School Grand Rounds, 3/2/2023

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The Awesome Potential of Open Science...
So, What’s the Big Deal?
The Challenge of Open Science

• How much and what data do you have to have to share to accomplish the benefits of open science?

• At what point does that sharing infringe on other ethical obligations we have to our patients and research participants?
Benefits of Open Science

- Transparency
- Reproducibility and Accountability
- Collaboration
- Community Engagement
Benefits of Open Science

• Transparency → Trial and hypothesis registration
• Reproducibility and Accountability → Access to research protocols and scientific data sufficient to validate and replicate research findings
• Collaboration → Timely and open access to scientific data and results
• Community Engagement → Timely and understandable (i.e., plain language) access to results

• Better Science!
The Risks of Open Science

Risks to Rights of Patients/Participants or Groups:

• Breach of confidentiality/privacy
• Right to know what’s done to your data and tissues
  • Especially if they are identifiable (including because human subjects research regulations still apply)
The Risks of Open Science

Risks to Scientific Integrity:

• Data problems
  • Unverified
  • Misuse
  • Tampering

• Intellectual property concerns
How Do We Achieve the Right Balance?

**Benefits**
- Transparency
- Reproducibility
- Accountability
- Collaboration
- Community Engagement

**Risks**
- Confidentiality/Privacy Risks
- Autonomy Risks
- Data Use Risks
Case Example: 2023 NIH Data Management & Sharing Policy
2023 NIH Data Management & Sharing Policy

• The final DMS Policy does not create a uniform requirement to share all scientific data (NOT-OD-21-013).

• Appropriate data sharing is likely to be varied and contextual (NOT-OD-21-013).

• NIH expects that in drafting Plans, researchers will maximize the appropriate sharing of scientific data, acknowledging certain factors (i.e., legal, ethical, or technical) that may affect the extent to which scientific data are preserved and shared (NOT-OD-21-013).

• NIH promotes the responsible sharing of scientific data consistent with protecting research participant privacy (NOT-OD-22-213).
What are the Ethical Limitations?

• Risk to privacy and confidentiality of participants

• Risk of harm to individual subjects or groups/populations

• Risk of violating other laws or regulations
How Can You Minimize Privacy Risks?

• Place limits on data sharing
  • When the data might compromise privacy or safety of participants
  • Sensitive data (e.g., stigmatizing, illegal behaviors, potential for group harm)
  • Limitations could be imposed by institutions, HRPPs, and/or IRBs

• Apply de-identification when possible (acknowledging its limits)

• Share through controlled access databases

• Establish data sharing and use agreements
  • DUA terms may also protect against data misuse
  • Ensure consistency of agreements with consent

• Apply privacy protections regardless of data type (e.g., NHSR)

• Appreciate other protections that may apply (federal, tribal, state, and local laws, regulations, and policies, for example, CoCs)
How Can You Minimize Individual or Group Risks?

• Ensure consent for the data sharing and future use has been obtained
  • With as much specificity as possible, include where and with whom data will be shared (e.g. controlled or open access repositories, collaborators or non-collaborators, non-profit or industry, etc), and any restrictions or limitations on sharing and future use (e.g., disease specific, type of analyses, etc).
  • IRBs have a required role in approving consents with this intended sharing
  • Institutions and HRPPs could be involved in implementation of data sharing policies and broad consent plans and reviewing agreements and sharing plans.

• Obtaining consent for future research use of data (and samples) upholds respect for persons, their values, and their autonomous choices, minimizes privacy risks, and promotes public confidence in medicine and research.
Source of Data and Participant Consent

**Discarded/Excess Clinical Specimens, or Any Derived Data, or Clinical Data**

- No Consent (Typically Not Human Subjects or Exempt Research)

**Data/Specimens Collected for Research**

- Consent Waived

- “Old” Research and No Record of Consent

**Consent but Not for Requested Use/Sharing**

- Consent is “Silent”

**Consent for Requested Use/Sharing**

- Consent Prohibits
Which Human Data May be Shared?

- Any limitations or restrictions described in the Informed Consent Document/Process must be honored
  - Type of sharing: Controlled access, uncontrolled/public, etc.
  - Data Use limitations: specific users, specific conditions/diseases
  - Destruction dates
- Any federal, state, local, or Tribal law, regulation, or policy that prohibits disclosure must be honored
- Any restrictions or limitations of current or anticipated agreements must be honored
Which Human Data May Not be Shared?

- Individual-level clinical/electronic medical record notes even if considered de-identified.
- Data with small cell sizes or data that can be used to infer information about or inadvertently identify an individual.
- Data that may be harmful or stigmatizing to an individual or to a particular group of people or a population.
- Any other individual-level “sensitive” data.
  - The NIH describes “sensitive” as “...including information regarding potentially stigmatizing traits, illegal behaviors, or other information that could be perceived as causing group harm or used for discriminatory purposes. Sensitive data may also include data from individuals, groups, or populations with unique attributes that increase the risk of re-identification.” (NOT-OD-22-213)
How Should Human Data Be Shared?

• Data must be anonymized or de-identified under HIPAA standards and requirements of federal human subjects regulations.

• Data may only be shared in controlled access repositories/conditions
  • EXCEPTION: Only data collected with explicit human research consent as approved by an IRB for sharing in public/open-access repositories may be shared in public/open access conditions.
  • Research subject to the GDS policy must also follow the funding-specific requirements for sharing and data use limitations (DULs).
How Can We Incentivize Open Science?

• IRBs/HRPPs tend to be conservative and prioritize protection of and risk minimization to participants.

• Researchers tend to be protective of their work and intellectual property.

• No one needs extra work.

• Regulatory changes will create requirements.

• Education and community engagement are essential.

• Consent is really the answer.
Take Home Points

• Open science has the awesome potential to lead to better science.
• HRPPs/IRBs play a critical role in maximizing the benefits and minimizing the risks of open science.
• HRPPs/IRBs should develop policies that both facilitate open science and protect participant autonomy and privacy.
  • Institutional policies on open science data sharing: What is required, encouraged, permissible, and restricted?
  • Procedures to ask researchers about data sharing and future use plans at the time of research initiation (and procedures for what to do if those plans change).
  • Templated consent form language to address different types of data sharing and future use.
• The best protection of autonomy and privacy in open science will require implementation of more transparent “permission” (or broad consent) for sharing and future use of clinical and research data and samples.
Acknowledgements

Martha Jones
Post-Presentation Poll

• Now that you have heard the discussion, do you think consideration of open science practices falls within an IRB’s responsibilities?
  • Yes
  • No
  • Unsure
Post-Presentation Poll

• Do you think IRBs should actively support open science practices?
  • Yes
  • No
  • Unsure
Questions?
Thank You!