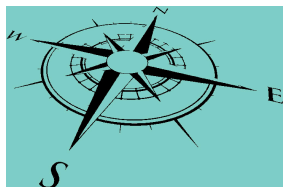


# Center for Open Science IMPACT REPORT 2020: Maximizing the impact of science together

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## Center for Open Science (COS)

### Description:

The Center for Open Science is a 501(c)(3) nonprofit organization. We work to catalyze grassroots community efforts to change research norms and help provide solutions, such as the OSF, an open-source, public goods infrastructure, to help stakeholders recalibrate reward systems.

### Stakeholder(s):

#### Brian Nosek

*Role:* Executive Director and Co-founder, Center for Open Science

#### Research Community

*Role:* Partnership

COS partners with stakeholders across the research community to advance the infrastructure, methods, norms, incentives, and policies shaping the future of research to achieve the greatest impact on improving credibility and accelerating discovery.

### Vision

Accelerated discovery, improved credibility

### Mission

To increase the openness, integrity, and reproducibility of research.

### Values

**Openness**

**Science**

**Reproducibility**

## 1. Infrastructure, Tools & Services

*Offer open science infrastructure, tools, and services*

### 1.1. Research

*Strengthen research*

Strengthening research at each stage of the research lifecycle — Research serves humanity most effectively when its outcomes are credible and reproducible. Credibility is maximized when rigor and transparency is applied during planning, conducting, reporting, and discovery of research... Sharing findings, data, code, and materials enables discovery for reuse and accessibility for review and extension. More than 260,000 researchers use OSF to collaborate and share their research, and about 4 million researchers discovered content on OSF for their own research in 2020 alone.

#### Performance Indicators

##### 1.1.1 Registrations

Description	Type	Start Date	End Date	Number
Unspecified	Target	2020-01-01	2020-12-31	
17K+ PLANNING - New registrations created on OSF	Actual	2020-01-01	2020-12-31	17,000

##### 1.1.2 Files

Description	Type	Start Date	End Date	Number
Unspecified	Target	2020-01-01	2020-12-31	
1M+ CONDUCTING - Number of new files shared publicly	Actual	2020-01-01	2020-12-31	1,000,000

##### 1.1.3 Papers

Description	Type	Start Date	End Date	Number
Unspecified	Target	2020-01-01	2020-12-31	
18K+ REPORTING - Papers shared via Preprint services	Actual	2020-01-01	2020-12-31	18,000

##### 1.1.4 Downloads

Description	Type	Start Date	End Date	Number
Unspecified	Target	2020-01-01	2020-12-31	
23M+ DISCOVERY - Number of files downloaded	Actual	2020-01-01	2020-12-31	23,000,000

### 1.2. Infrastructure & Solutions

*Provide open-source, public goods infrastructure and customizable solutions for groups to cultivate culture change in their own communities*

Infrastructure for culture change — Researchers and stakeholders around the world rely on trusted infrastructure and workflows to enable their efforts to conduct rigorous, transparent research. COS provides open-source,

public goods infrastructure and customizable solutions for groups to cultivate culture change in their own communities.

## Performance Indicators

### 1.2.1 Culture Change

Description	Type	Status	Start Date	End Date
Groups cultivate culture change in their own communities	Target		2020-01-01	2020-12-31
	Actual		2020-01-01	2020-12-31

## 1.3. Registries

*Empower research groups, funders, and journals to create research registries and support reproducible methods for their community of practice, awardees, or authors*

Branded Registries — This year COS launched Branded Registries, a new interface built on the OSF Registries infrastructure that empowers any research group, funder, or journal to create a research registry and support reproducible methods for their community of practice, awardees, or authors. Each branded registry provides customized preregistration templates and workflows, allowing scientific communities to facilitate rigor among their researchers with the infrastructure tailored to their field... Branded Registries, and COS's other infrastructure products, is one component of our integrated strategy for changing research cultures.

## Performance Indicators

### 1.3.1 Registries

Description	Type	Status	Start Date	End Date
Create research registries	Target		2020-01-01	2020-12-31
	Actual		2020-01-01	2020-12-31

### 1.3.2 Methods

Description	Type	Status	Start Date	End Date
Support reproducible methods	Target		2020-01-01	2020-12-31
	Actual		2020-01-01	2020-12-31

### 1.3.1. Transparency

*Elevate visibility of journal and funder transparency policies*

Make it required — TOP Factor elevates visibility of journal and funder transparency policies. Comparative data rewards progressive policymakers and encourages slower actors to join the reform movement.

#### Stakeholder(s):

**Journals**

**Funders**

## Performance Indicators

### 1.3.1.1 Rewards & Encouragement

Description	Type	Status	Start Date	End Date
Reward progressive policymakers and encourage slower actors to join the reform movement	Target		2020-01-01	2020-12-31
	Actual		2020-01-01	2020-12-31

### 1.3.2. Incentives

*Realign incentives with Rigor and Transparency initiatives*

Make it rewarding — Journals and funders collaborate to realign incentives with Rigor and Transparency initiatives using Registered Reports... Learn more about Rigor and Transparency initiatives for funders and publishers at [osf.io/ktsur](https://osf.io/ktsur), or visit [cos.io/rti](https://cos.io/rti) to request more information.

## Performance Indicators

### 1.3.2.1 Realignment

Description	Type	Status	Start Date	End Date
Unspecified	Target		2020-01-01	2020-12-31
	Actual		2020-01-01	2020-12-31

### 1.3.3. Norms & Rigor

*Enable communities to cultivate preregistration norms and improve rigor*

Make it normative — Custom branded registries enable communities to cultivate preregistration norms and improve rigor.

## Performance Indicators

### 1.3.3.1 Communities

Description	Type	Start Date	End Date	Number
Unspecified	Target	2020-01-01	2020-12-31	
	Actual	2020-01-01	2020-12-31	

### 1.3.4. Registration

*Streamline the registration process*

Make it easy — OSF Registries streamlines the registration process with easy-to-use workflows.

## Performance Indicators

### 1.3.4.1 Workflows

Description	Type	Ease of Use	Start Date	End Date
Provide easy-to-use workflows	Target		2020-01-01	2020-12-31
	Actual		2020-01-01	2020-12-31

### 1.3.5. Preregistration

*Enable preregistration*

Make it possible — OSF enables preregistration.

## Performance Indicators

### 1.3.5.1 Formats

Description	Type	Status	Start Date	End Date
Unspecified	Target		2020-01-01	2020-12-31
New registration formats this year broaden inclusion of research methodologies such as qualitative research, secondary data analysis, longitudinal investigations, and systematic reviews, and more.	Actual	Broader	2020-01-01	2020-12-31

## 2. Communities

### Enable open practices

#### Stakeholder(s)

##### Research Communities

*Role:* Enablement

Communities enabling open practices

##### NII Japan

*Role:* Adaptation & Scaling

The National Institute of Informatics (NII) consulted with COS to adapt OSF's open source code to scale and launch the Japanese research data management platform GakuNin RDM (GRDM) to adhere to regulatory and compliance requirements for the region. The data management and preservation infrastructure is built using OSF, enhanced by customizations for integration with domestic scholarly platforms and Japanese institutional repositories that enable open sharing, discovery, rigor, and innovation among Japanese and Malaysian researchers. NII engineers and RDM operators collaborated with the open source development team at COS to consult on a local deployment of OSF, customizations, and training to support shared goals of openness, transparency and reproducibility of research around the globe.

##### Yusuke Komiyama :

*National Institute of Informatics*

*Role:* Endorsement

"GRDM is continuously developing as an OSS for research promotion and research integrity based on Open Science Framework (OSF). From 2019 to 2020, 19 institutions have already adopted GRDM in the demonstration phase, with plans to start the production operation in 2021. NII RDC is also recommended for use in research data management in major competitive grants by the government and increases the number of institutions using the service."

##### Focused Ultrasound :

*The Focused Ultrasound Foundation launched FocUS Archive on OSF Preprints in 2017 to accelerate open research sharing in the field of ultrasound treatments and technology. But their commitment to accelerating scientific progress didn't stop there. In late 2020, they will launch the Focused Ultrasound Foundation Collection on OSF Collections to aggregate the data, materials, and outcomes of their grantees' work. The collection provides easy-to-use submission and discovery interfaces to foster sharing and reuse.*

##### Emily White :

*Focused Ultrasound*

*Role:* Endorsement

"The Focused Ultrasound Foundation embraces open science practices with our research community because we fundamentally believe implementation of those practices result in research products that have better rigor, reproducibility, and increase the threshold of quality research. Additionally, our use of OSF Preprints and OSF Collections not only help with the quality of the research, but accelerates the timeline this research is available to the larger community. Better discoverability. As a medi-

cal research funder, we're always trying to figure out how to get from bench to bedside both as fast and as safe as possible, and open science practices helps us do that. It's all about the patients."

##### Ghent University

*Role:* Support

Ghent University supports transparent and rigorous research among its institutional researchers with the OSF Institutions interface. Ghent researchers take advantage of OSF Institutions' streamlined data management structure, preregistration workflows, collaboration features, and more to generate and share high-impact research. In addition to supporting almost 200 Ghent-affiliated users, over 800 projects, and 200 registrations, the university has partnered with COS to integrate one of the most popular cloud storage providers with OSF, OneDrive for Business, used by institutions and researchers around the world. This storage service will be available as an OSF storage add-on in Q1 2021 to all OSF users. Shared, open infrastructure dramatically extends the impact of infrastructure investments.

##### Myriam Mertens :

*Ghent University*

*Role:* Endorsement

"Open Science is, and has been for many years, an important component of Ghent University's research strategy. It is also highly valued by a significant and ever growing segment of our research community. We became a member of OSF Institutions a couple of years ago to support our researchers in their efforts to share research workflows and outputs for validation and reuse purposes, and to help identify our own open science champions. Going forward, we want to continue to expand our OSF Institutions user base, in order to grow our organisation's open science community and further strengthen transparent, reproducible, and collaborative research practices across disciplines."

##### AfricArXiv

*Role:* Support

AfricArXiv began as a pan-African cross-disciplinary preprint platform in 2018, and furthered its commitment in 2020 by launching a roadmap with new opportunities to support open, rigorous, and reproducible research practices. The new project encompasses training training events, collaborative initiatives for the African research diaspora, and incentives for greater openness and transparency in pan-African scholarship.

##### Johanssen Obanda :

*AfricArXiv*

*Role:* Endorsement

"Through partnerships like the one established with COS, we hope to establish an independent, efficient, sustainable and decentralized research repository that serves as an

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*Stakeholders (continued)*

interoperable platform for contributions by African researchers, and for all scientists who work in an African context, with the goal to increase discoverability of African research.”

**EGAP***Role: Integration*

COS celebrated the integration of the Evidence in Governance and Politics (EGAP) registry with OSF Registries. The EGAP registry provides social scientists an interface to discover existing work, submit a registration of their own, or begin conducting rigorous research using the connected OSF infrastructure as a project workspace.

**Matthew Lisiecki :***EGAP**Role: Endorsement*

“Over the past several years, the EGAP Registry has been gaining momentum and more awareness by researchers studying subjects related to governance, institutions, politics, and accountability. Simultaneously, OSF offers a flexible registration infrastructure that can support any registry and leverage OSF’s other features for the research life cycle. By making the two systems work together, we aim to reduce the time researchers spend entering duplicate information while increasing the sharing of accurate and transparent information on research projects.”

**Open Scholarship Knowledge Base***Role: Knowledge Base*

Open science advocates and volunteers around the world and across disciplines came together to compile, curate, edit, and review open education resources that ultimately launched the Open Scholarship Knowledge Base (OSKB) in August 2020. The volunteer-led initiative, backed by COS, is a growing body of education and training materials covering the what, why, and how of open scholarship.

**STEM Education Resource Hub***Role: Resource Hub*

Education research volunteers coalesced in June 2020 to begin work on the STEM Education Resource Hub. The

**2.1. Leadership & Support**

*Back researchers with community leadership and support for reproducible practices*

**Stakeholder(s):****Researchers***Role: Adoption*

Researchers are more likely to adopt reproducible practices when they are backed by community leadership and support. Learn about the groups,

STEM Hub provides education researchers with connection to all COS services and grassroots organizing to nurture the education community toward open, reproducible research. The Hub will catalyze innovation in education research through community-led events and support for collaboration on research, training, and culture change.

**Erin Buchanan :***Harrisburg University of Science and Technology**Role: Endorsement*

“The Education group was formed to support students and teachers alike to find open access materials for their needs. Access to all types of materials is especially critical for countries that use internet blockades to limit information to their citizens. We welcome everyone to contribute and use the hub!”

**Many Labs 5***Role: Collaboration*

More than 170 researchers collaborated on Many Labs 5, the final “Many Labs” project that comprised 11 papers and the entire Fall issue of *Advances in Methods and Practices in Psychological Science*. Led by Charlie Ebersole, a postdoc at the University of Virginia, the study investigated whether conducting formal peer review by experts in advance could improve replicability of earlier findings that mostly failed to replicate in the Reproducibility Project: Psychology. The evidence countered critics’ claims that prior failures to replicate were due to low power studies that did not meet quality standards.

**COSGN***Role: Meta-Networking*

Over 120 open science grassroots communities came together online in 2020 to form the Community of Open Scholarship Grassroots Networks (COSGN) creating a meta-network of mostly volunteer networks with broad representation across regions, disciplines, and research scope. Join the community hub to collaborate and dialog with fellow open science grassroots peers working to disseminate research best practices.

institutions, and funders partnering with COS to equip their researchers with open infrastructure, methods, and training.

**Performance Indicators****2.1.1 Leadership & Support**

Description	Type	Status	Start Date	End Date
Provide community leadership and support to researchers	Target		2020-01-01	2020-12-31
	Actual		2020-01-01	2020-12-31

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### 3. Incentives

#### *Reengineer incentives to support openness and transparency*

We shift the research culture toward greater reproducibility by partnering with research stakeholders to realign the norms, incentives, and policies that shape researcher behavior.

#### 3.1. Journals

##### *Rate the degree of openness and transparency of journal policies*

TOP Factor — TOP Factor rates the degree of openness and transparency of journal policies to provide authors with information and to encourage progression toward more assertive transparency policies by journal editors. COS recognizes the journals working to implement policies promoting transparency and reproducibility and alter dysfunctional publishing incentives that reward novelty over rigor.

##### Stakeholder(s):

##### **Taylor & Francis**

###### *Role: Visibility*

COS acknowledges publishers like Taylor & Francis raising the visibility of open practices through efforts like open science badging, an initiative to incentivize and reward transparent behaviors such as data sharing, making materials publicly available, and preregistering research designs.

##### **Journals**

###### *Role: Representation*

Over 400 journals are now represented on TOP Factor since its launch this year, with more than 200 to be added soon.

#### Performance Indicators

##### 3.1.1 Listings

Description	Type	Start Date	End Date	Number
Unspecified	Target	2020-01-01	2020-12-31	
413 Journals listed at topfactor.org	Actual	2020-01-01	2020-12-31	413

### 3.1.2 Improvements

Description	Type	Start Date	End Date	Percentage
Unspecified	Target	2020-01-01	2020-12-31	
In a pilot test, being assessed via TOP Factor prompted 24% of journals listed to improve their score within 6 weeks.	Actual	2020-01-01	2020-12-31	24

### 3.2. Preparedness

*Assess the preparedness of research communities for culture change*

The OSS measures opinions, behaviors, and perceived incentives around open practices such as open access, preprints, preregistration, replication and sharing data, materials, and code. The OSS is applicable across disciplines, regions, and career stage, enabling stakeholders to receive comparative data about the state of their community versus peer institutions or disciplines.

#### Stakeholder(s):

**Bodo Stern** :  
HHMI

*Role:* Endorsement

“In 2019 the Center for Open Science (COS) conducted an open science survey of HHMI scientists on behalf of HHMI. This close collaboration was important to HHMI, because the survey results

influenced the design and communication of HHMI’s new open access policy. The COS survey gave HHMI scientists a voice in shaping this important policy and contributed to a remarkably positive reception when the policy was announced on October 1, 2020.”

#### Performance Indicators

##### 3.2.1 Survey

Description	Type	Status	Start Date	End Date
Unspecified	Target		2020-01-01	2020-12-31
COS unveiled the Open Scholarship Survey (OSS) to help funders, institutions, and other stakeholders assess the preparedness of their research communities for culture change.	Actual	Unveiled	2020-01-01	2020-12-31

### 3.3. Rigor & Transparency

*Pursue culture change toward rigor and transparency*

Research Transparency Initiatives

#### Stakeholder(s):

**Julie Schafer** :  
Flu Lab

*Role:* Endorsement

“Flu Lab believes that addressing a challenge as formidable as influenza requires greater availability of information and collaboration. As funders, increasing the publication of null and negative results and replication studies is an important part of our efforts to promote transparency and open science principles in the influenza research community. We are pleased to partner with

Center for Open Science, which shares our values and a willingness to experiment with new programs and approaches.”

#### Publishers

*Role:* Usage

Use COS Research Transparency Initiative (RTI) consulting services as they pursue culture change toward rigor and transparency.

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Stakeholders (continued)

**Funders**

*Role:* Usage

Use COS Research Transparency Initiative (RTI) consulting services as they pursue culture change toward rigor and transparency.

Use COS Research Transparency Initiative (RTI) consulting services as they pursue culture change toward rigor and transparency.

**NSF**

*Role:* Funding

And, with a recent award from NSF, COS is evaluating the effectiveness of these initiatives in spurring culture change.

**Research Groups**

*Role:* Usage

**Performance Indicators**

**3.3.1 Design & Administration**

Description	Type	Status	Start Date	End Date
	Target			
The RTI project assists stakeholders in designing and administering culture change initiatives, particularly partnerships between funders and journals to reduce publication bias, promote rigor and replication, and increase credibility.	Actual		2020-01-01	2020-12-31

**3.3.2 Effectiveness**

Description	Type	Status	Start Date	End Date
Evaluate the effectiveness of these initiatives in spurring culture change.	Target		2020-01-01	2020-12-31
	Actual		2020-01-01	2020-12-31

## 4. Research

*Conduct evaluations and interventions to improve research*

### Stakeholder(s)

#### Labs

*Role:* Evaluation  
Evaluate science and the scientific process

#### Research Groups

*Role:* Evaluation  
Evaluate science and the scientific process

#### Funders

*Role:* Evaluation  
Evaluate science and the scientific process

We collaborate with labs, funders, and research groups to evaluate science and the scientific process. Studying how research is done surfaces deficiencies and spurs methodological innovation.

### 4.1. Replicability

*Provide evidence that transparent and rigorous procedures are associated with high replicability*

High Replicability of Newly-Discovered Social-behavioral Findings is Achievable

#### Performance Indicators

##### 4.1.1 Replicability

Description	Type	Status	Start Date	End Date
Unspecified	Target		2020-01-01	2020-12-31
A prospective replication study of 16 novel experimental findings released as a preprint in September 2020 provides evidence that transparent and rigorous procedures are associated with high replicability.	Actual	High	2020-09-01	2020-09-30

### 4.2. Preprints

*Identify signals servers can implement to increase the credibility of preprints*

Credibility of preprints: an interdisciplinary survey of researchers — Preprints services can accelerate scholarly communication and improve accessibility, but do researchers find them credible enough to use?

## Performance Indicators

### 4.2.1 Signals

Description	Type	Status	Start Date	End Date
Unspecified	Target		2020-01-01	2020-12-31
A survey of 3,759 researchers across disciplines identified the signals preprint servers can implement—such as cues for available data, materials, and code—to help researchers better assess credibility and trust in preprints.	Actual	Identified	2020-01-01	2020-12-31

## 4.3. Metascience

*Mature metascience as a disciplinary community and produce new mechanisms for collaboration and innovation*

Metascience: the emerging field of research on the scientific process

### Stakeholder(s):

**Metascience Community**

*Role: Collaboration*

*Role: Innovation*

## Performance Indicators

### 4.3.1 Metascience

Description	Type	Status	Start Date	End Date
Unspecified	Target		2020-01-01	2020-12-31
Metascience continued to mature as a disciplinary community in 2020, and produced new mechanisms for collaboration and innovation, including the Metascience research collection and Metascience registry.	Actual	Maturing	2020-01-01	2020-12-31

## 5. Culture

*Enact change in the research culture*

### Stakeholder(s)

#### Researchers

*Role:* Promotion

All researchers and stakeholders play a part in maximizing scientific impact and changing research culture when they engage with and promote open and transparent behaviors, norms, and incentives across the research lifecycle.

#### Institutions

#### Policymakers

Stewards of science for a better world

#### Publishers

#### Funders

#### Donors

*Role:* Funding

COS could not accomplish its mission without the collective support of individual donors, philanthropic foundations, and research funders. Visit [cos.io/supporters](https://cos.io/supporters) to learn more about the financial partners that furthered COS's open science initiatives in 2020.

### 5.1. Strategies

*Foster the creation of strategies for greater reproducibility*

Shifting the research culture toward greater reproducibility requires a comprehensive and progressive strategy at every tier.

### Performance Indicators

#### 5.1.1 Strategies

Description	Type	Status	Start Date	End Date
Create research reproducibility strategies	Target		2020-01-01	2020-12-31
	Actual		2020-01-01	2020-12-31

## Administrative Information

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