

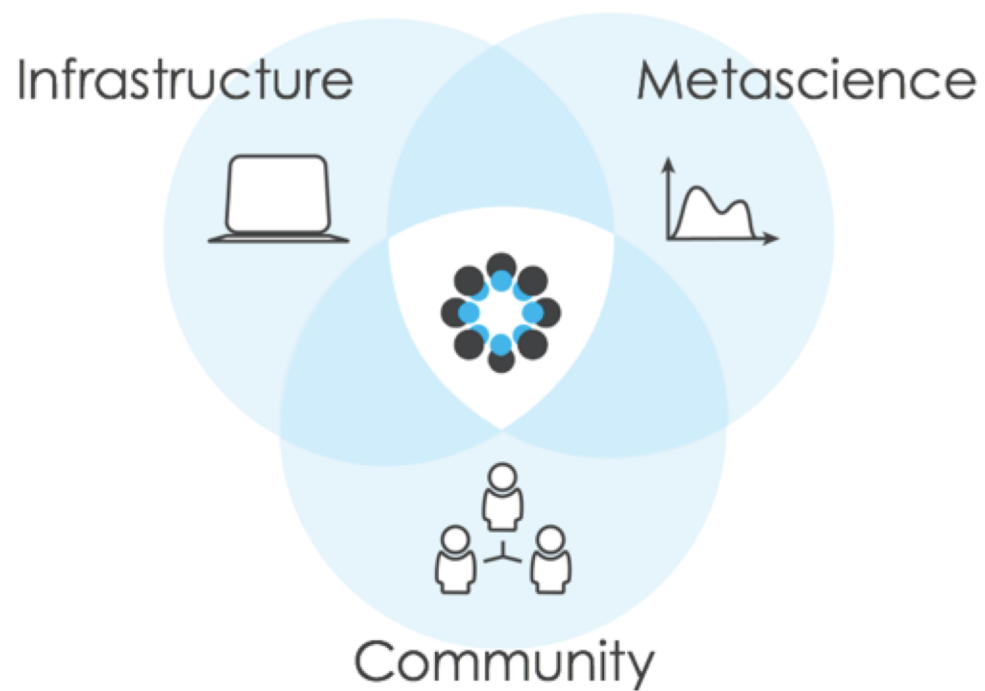


Promoting and Enabling Open Research Practices

**Forecasting Costs for Preserving, Archiving, and Promoting
Access to Biomedical Data: A Workshop
July 11-12, 2019**



Our mission is to increase openness, integrity, and reproducibility of research.





Metascience

Studies the state of reproducibility of research and evaluates interventions

The goals of COS's research are to:

- understand research reproducibility and efficiency challenges
- raise awareness, knowledge, and motivation to change research practices
- continuously evaluate and improve policy & technology solutions to meet the mission



Technology

Open-source technologies that make it possible and easy for researchers to implement policy-aligned behaviors across the research lifecycle

- **OSF.io**, a project management platform that enables collaboration, storing & sharing data and materials, and easily controlling public and private access to the research
- **OSF Preprints**, a publishing platform for preprints, postprints, and other papers
- **OSF Registries**, captures study design and analysis plan prior to data collection
- **OSF Collections**, submission and discovery interface for sharing data and studies
- **OSF Institutions**, a platform for universities and research institutions to foster collaboration, ensure open, persistent access to research outcomes, and promote visibility of research at the institutional level



Policy

Studies the state of reproducibility of research and evaluates interventions

The goals of COS's research are to:

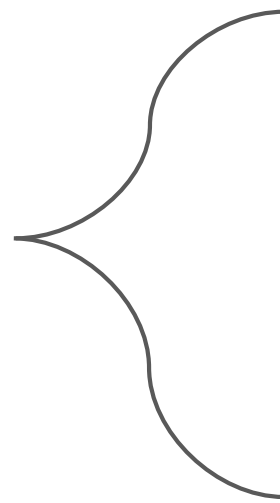
- understand research reproducibility and efficiency challenges
- raise awareness, knowledge, and motivation to change research practices
- continuously evaluate and improve policy & technology solutions to meet the mission

Policy: TOP Guidelines

Level I: Disclosed

Level II: Required

Level III: Verified



1. Data citation
2. Design transparency
3. Research materials transparency
4. Data transparency
5. Analytic methods (code) transparency
6. Preregistration of studies
7. Preregistration of analysis plans
8. Replication

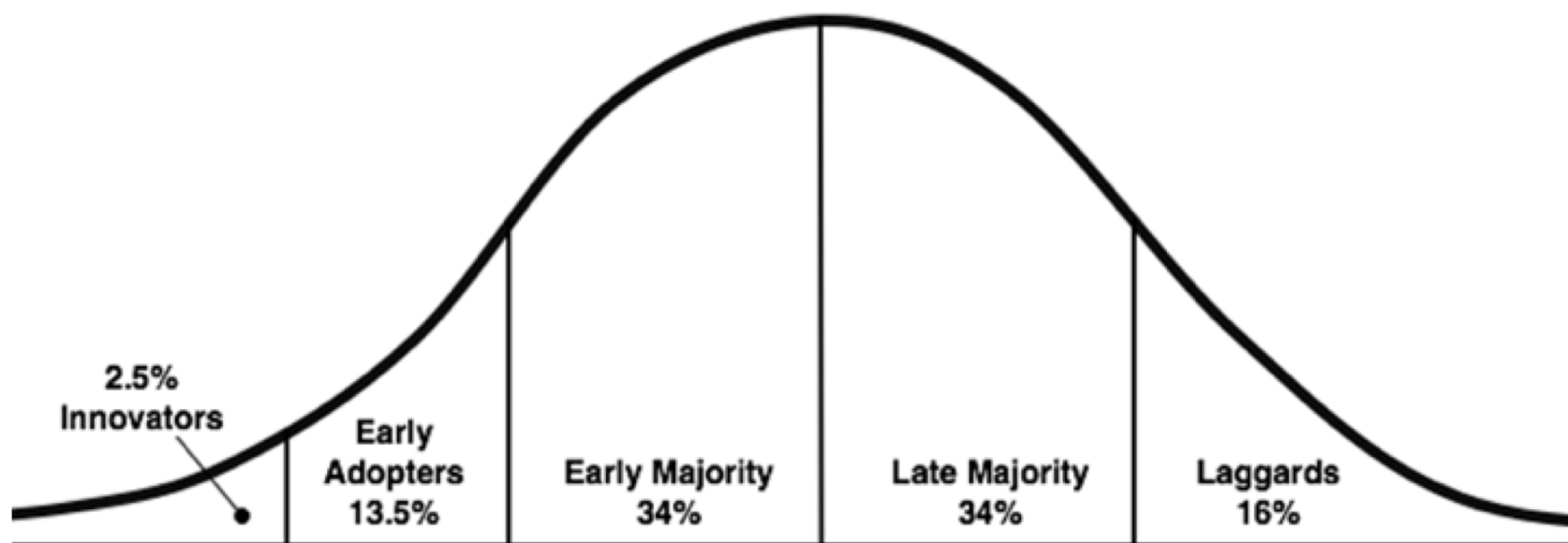
<https://cos.io/top/>



Open Science Solutions for Reproducibility Problems

	Prereg Studies	Prereg Analysis Plans	Open Data	Open Materials	Open Outcomes
Publication Bias	X				X
Questionable Research Practices (<i>rigor</i>)		X			X
Reproducibility (<i>same data, same methods</i>)			X		
Robustness (<i>same data, different methods</i>)			X		
Replication (<i>new data, similar methods</i>)				X	
Reuse for replication or extension				X	
Reuse for novel analysis or aggregating evidence			X		

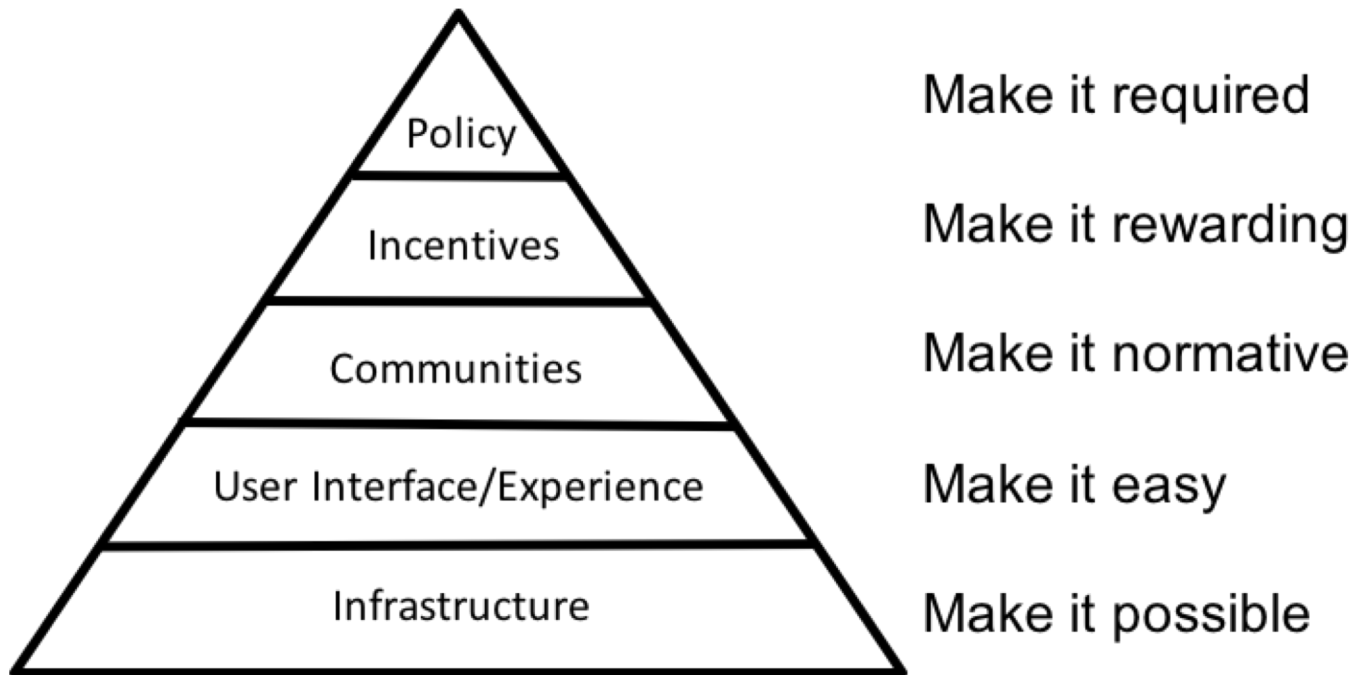
Changing a Research Culture



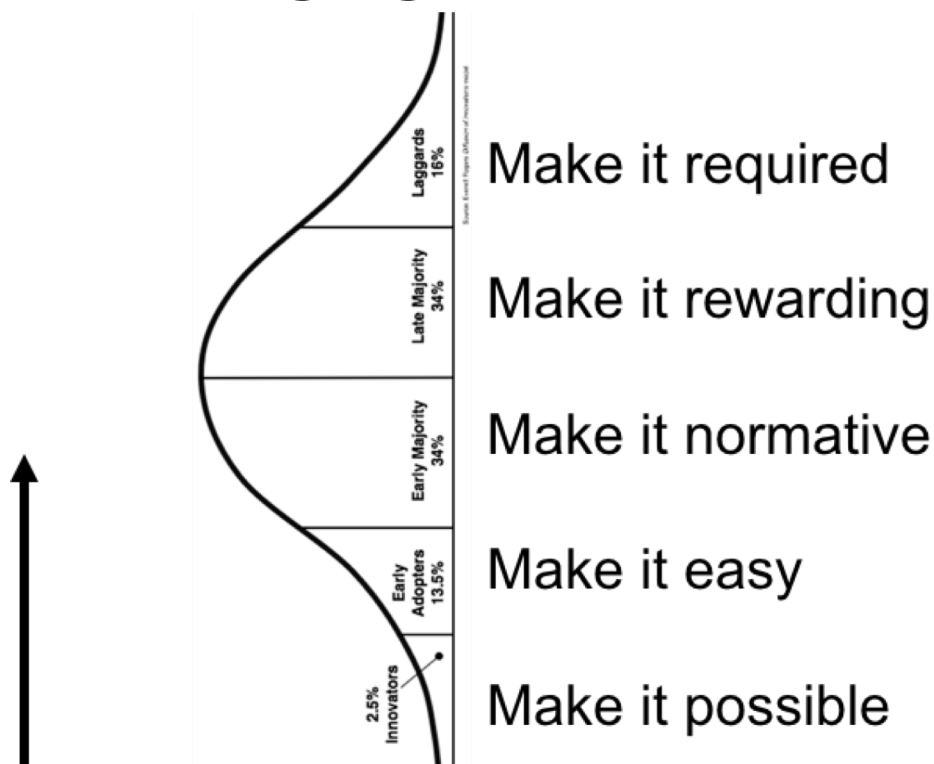
Source: Everett Rogers, Diffusion of Innovations model

Diffusion of Innovations; Rogers, 1963

Changing a Research Culture



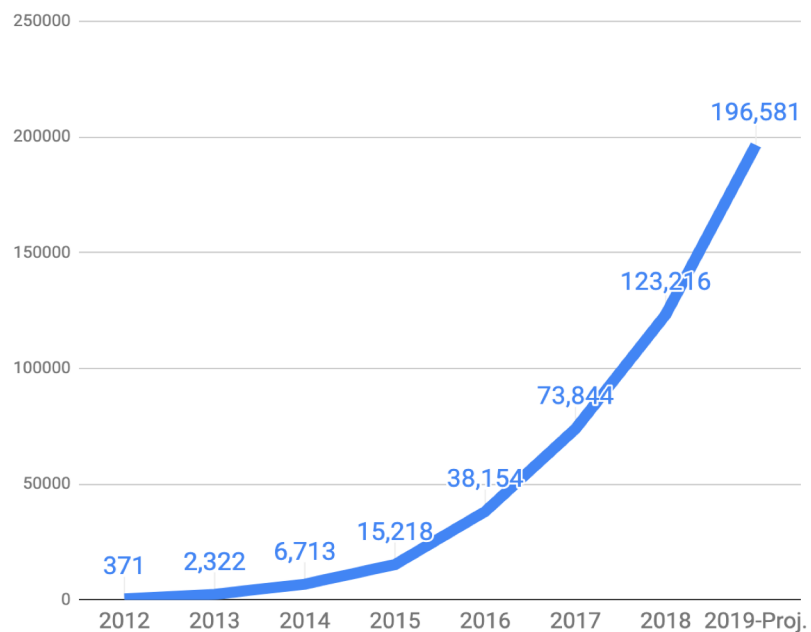
Changing a Research Culture



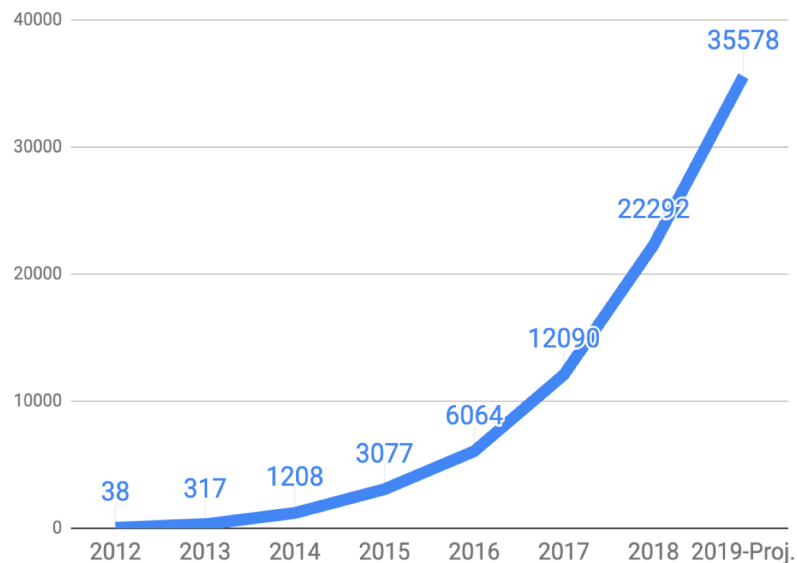


Growth of OSF

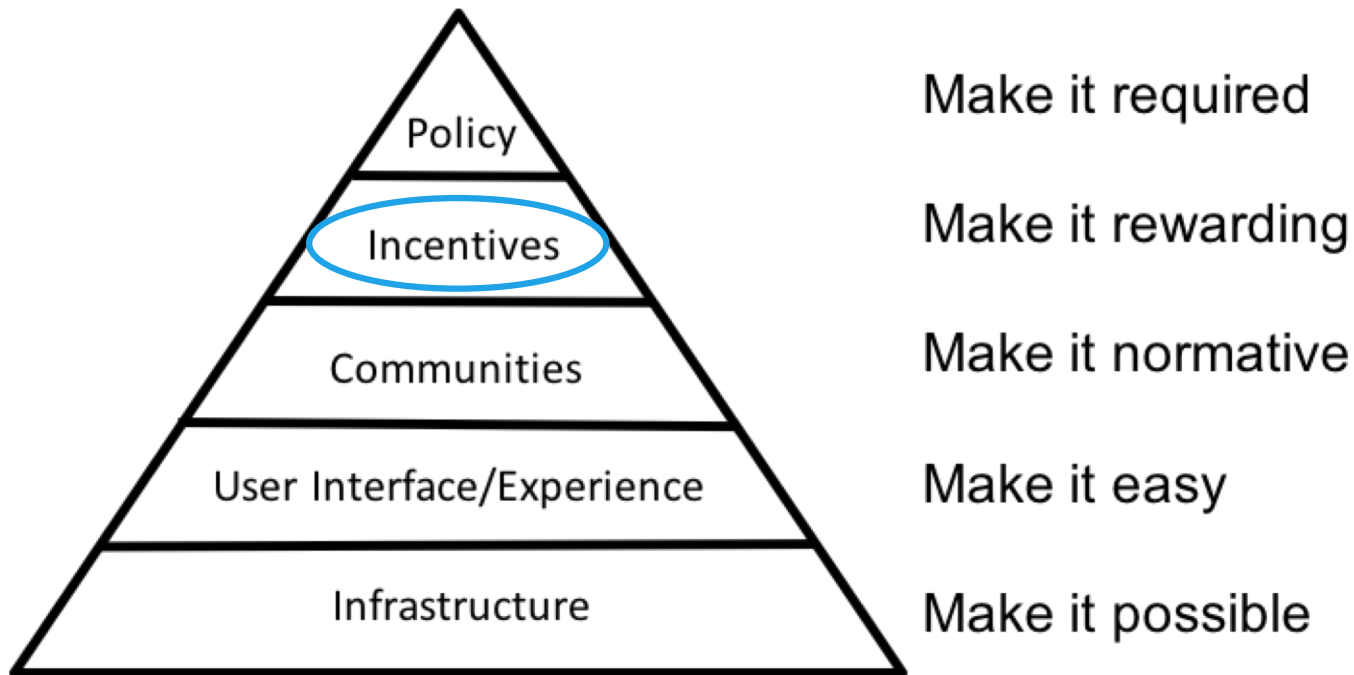
Number of Registered OSF Users



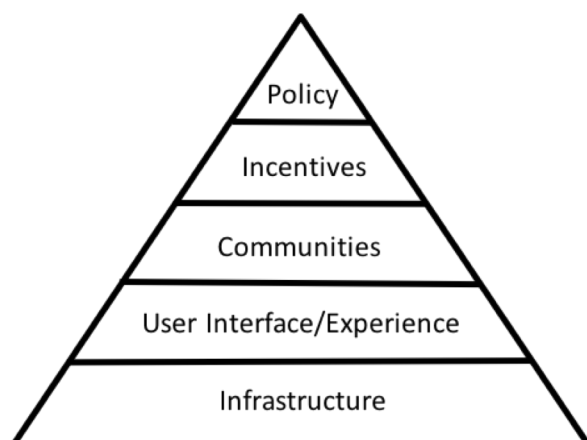
Number of OSF Study Registrations



Changing a Research Culture



Incentives & Mechanism



Make it required

Make it rewarding

Make it normative

Make it easy

Make it possible

1) List the desired action in the grant call as a desired action and scored by reviewers with a structured rubric

2) Recognize desired actions through a process that their peers would recognize and respect (anything that could be listed on a CV, such as awards for the action)

3) Support and encourage/require use of open repositories and open registries.

Signals: Making Behaviors Visible Promotes Adoption



Kidwell et al., 2016

Incentivizing Rigorous Study Design: Registered Reports



If **YES**, then study is granted “in principle acceptance” (IPA), a promise to publish regardless of outcome.



Long Term Planning

- Ensuring persistence of data, code and materials, starting with partnerships with other open infrastructure solutions
- Advocating for funding and publishing policies that support best practices for individual researchers -- make it normative/rewarding/required