PathOS
Open Science Impact Pathways

Unveiling Open Science Impact: Findings and Insights from the PathOS Project

PathOS is a Horizon Europe project aiming to identify collect evidence of Open Science effects across academia, society, and the economy, to enhance understanding and drive informed policy-making, map the Causal Pathways for Open Science, design and estimate OS Impact Indicators for chosen case studies through a data-driven, AI-assisted approach, and formulate a Cost-Benefit Analysis framework tailored to Open Science practices and implement it in selected Open Science practices.

Evidence of Open Science Impact

An extensive review of 500 + papers was undertaken, to establish what evidence exists in the literature regarding the academic, societal, and economic impacts of Open Science.

Main findings:

Academic impact: Evidence suggests an OA citation advantage; exclusion of authors from less-resourced regions and institutions due to APCs; and that "predatory publishing" threatens the quality of the research literature. Open/FAIR Data promote data reuse and increase citations for related papers, but their impact on fostering computational reproducibility is less significant than expected.

Societal impact: The majority of studies relevant to societal impact concern Citizen Science, with some focused on OA, and only a few addressing other aspects. Key areas of impact found are education and awareness, climate and environment, and social engagement. Our findings demonstrate a critical need for additional evidence and suggest practical and policy implications.

Economic impact: Evidence of cost savings (faster access to knowledge and avoiding duplication) as a direct economic impact; Medical and biotech sectors show the greatest evidence of benefits.

Open Science Pathways

Based on the the impact pathway concept described in PathOS Open Science Intervention Logic and the scoping review, Key Impact Pathways (from activities to the creation of outputs, outcomes, and impacts) are being developed in the context of Open Science.
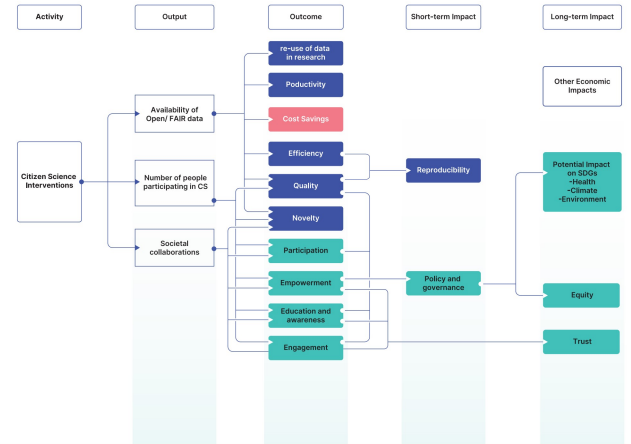
Handbook of Open Science Indicators

The Open Science Indicators Handbook collects meaningful indicators for Open Science under the academic, societal, economic and reproducibility categories. It intends to function as a "cookbook" for ready implementation, and each indicator is constituted by its description, how it can be measured, suggested data sources, correlations, and the most important references on the subject.

6 CASE STUDIES
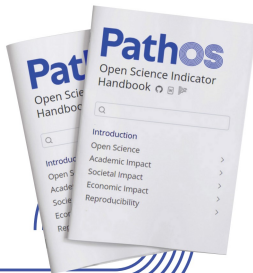
- Accelerating collaborations within academia & industry
- Research data and knowledge / use in non-academia
- Open Science Practices during the COVID-19 pandemic
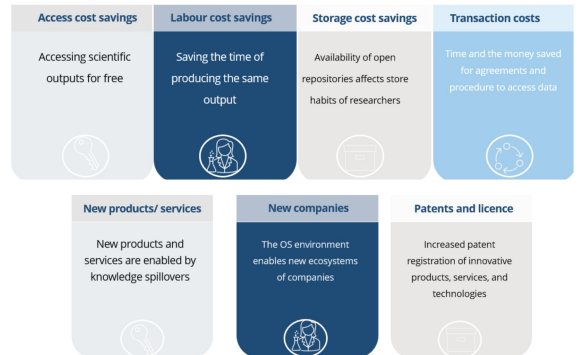- Emerging Topics Fostered by Open Science
- Cross cutting effects due to Open Research data from National Repository
- Innovation from open Research resources

Cost-Benefit Analysis

A cost-benefit analysis framework for Open Science is under development, ensuring consistency in measuring the impacts of Open Science by considering not only benefits but also costs and, moreover, comparing them with a scenario when OS is not available.

Access cost savings — Accessing scientific outputs for free

Labour cost savings — Saving the time of producing the same output

Storage cost savings — Availability of open repositories affects store habits of researchers

Transaction costs — Time and the money saved for agreements and procedure to access data

New products/ services — New products and services are enabled by knowledge spillovers

New companies — The OS environment enables new ecosystems of companies

Patents and licence — Increased patent registration of innovative products, services, and technologies

Stay tuned for our results

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