

Why Open Science Matters?

“Open science as an integral tool in the fight against COVID-19 is indisputable: the importance of access to scientific articles and data to help identify promising vaccines and therapeutics was recognized by publishers and researchers alike early in the pandemic.”

Michael M. Crow, Greg Tananbaum
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This year the world has shown us how important it is that everyone works together in the most effective way – and in that sense, the global pandemic only makes the case for ‘open’ stronger. Within one month of the first reported case, the virus was rapidly sequenced and openly posted to GenBank, the NIH genetic sequence database. Scores of researchers racing to learn more about COVID-19 shared their early findings as openly accessible preprints. These findings were tested and refined in real-time discussions that were tracked publicly and transparently. Papers that could not withstand replication and reproducibility efforts were quickly and publicly debunked, allowing the scientific community to pursue more promising research avenues. Society and commercial publishers made subscription-controlled coronavirus articles available to all.

From a societal point of view, the COVID-19 case study showed that the daily workings of science have practical ramifications in all our lives. Scientific norms affect not just researchers working in labs, but also policy makers, doctors, patients, families, and the general public. It showed that open science is the form of research dissemination and global collaboration that best reduces vexing limits to knowledge.

Then, if rapidly and openly sharing research data and papers is critical to understanding and combating coronavirus, doesn't the same hold true for cancer? Heart disease? Climate change? The scientific community — moving with great speed and clarity of purpose — has clearly signaled that open science is the most efficient way to tackle issues that have significant and direct effects on the lives of the general public. The unambiguous conclusion is that open is better for science.

Open Science is also better for the economy. A McKinsey estimate from 2013 puts the potential economic value of open data alone in the trillions of dollars annually. And a more recent 2020 study on the economic impact of open data published by the European Data Portal forecasts up to 1.9 million employees in Europe working in open data by 2025.

By leaning into open science practices, we can fuel innovation, job creation and economic growth. For example, around the turn of the century, the massive and successful Human Genome Project placed research results in the public domain. This commitment to open science generated nearly \$800 billion dollars in economic benefits between 1988 and 2010, a return on investment of \$141 for each dollar of the federal government's investment in the project. More than 310,000 jobs in the U.S. economy were created, directly and indirectly, totaling almost four million job-years of employment as a result of this scientific undertaking.

Open science matters so much because R&D is tremendously important – as the past year has shown like no other – global R&D spending has reached almost \$ 1.7 trillion.

Publishing is only a relatively small element of the R&D process in terms of spend - it costs less than 1% of R&D spending, but it has a very big role to play, helping to ensure that the other 99% is spent more efficiently and effectively to accelerate progress.

Openness is such a key tool for progress and this includes enhancing diversity and inclusion in the research process itself: transparency will improve accountability.

