

Federal research funding has positive 'ripple effects'

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Federal funding for biomedical research has a "ripple effect" of stimulating new studies even beyond the original purposes of a grant and may provide unexpected benefits, a new study suggests.

Researchers used a unique dataset to get a never-before-seen view of how [science funding](#) is spent and the results it produces.

The findings, published today in the journal *Science Advances*, showed that [funding](#) of research by the National Institutes of Health mostly goes to hiring people who work on the projects funded by grants.

But these people—which includes staff and trainees like graduate students—go on to do more than just work on the grants for which they were hired, said Enrico Berkes, co-author of the study and postdoctoral researcher in economics at The Ohio State University.

"We see a great increase in productivity in publications directly linked to a grant but also in new studies that go beyond it," Berkes said. "There is this ripple effect where people supported by the grant also produce other quality work."

And the biomedical researchers who are the focus of this study produced more [clinical research](#) as the result of receiving more funding—studies directly related to patient care and health, said study co-author Bruce Weinberg, professor of economics at Ohio State.

"Funding is actually producing the kind of research that would lead to improvements in clinical outcomes for patients," Weinberg said.

The key to this study is the [UMETRICS](#) dataset available through the Institute for Research on Innovation and Science. It provides detailed information concerning payments on sponsored research projects at 72 universities.

This allowed the researchers to use payments to identify all people working on research projects funded by NIH—from faculty members to trainees to staff.

Berkes, Weinberg and colleagues then used the [PubMed](#) database to find all research publications produced by the scientists in the UMETRICS database. They examined NIH grants between 1985 and 2020.

"We were able to link people to research projects by following the money," Weinberg said. "This allowed us to answer a question that wasn't possible before—how money spent on research impacts people."

Results showed that 68% of grant funding went to spending on employees, which included faculty members, postdoctoral researchers, graduate and undergraduate students, research staff and other staff.

Increases in funding led labs to become more professionalized by hiring more staff and career researchers, findings showed. In fact, research and other staff showed a higher percentage of growth in employment than faculty members when funding increased.

As funding increased and research teams got larger, they produced more scientific papers—and the quality of research did not decline.

"One hypothesis would be that as teams grow larger, they would become more bureaucratic, and it would become more difficult to produce quality science. But we found that labs kept productivity up, likely because they become more professionalized," Berkes said.

Findings showed that the largest increase in papers comes from studies not directly related to the grant. These are often papers that are not co-authored by the principal investigator, the researcher who is responsible for getting and managing the funding.

One way to understand the ripple effects of funding for medical research is to see how many research papers the people involved with the grants produce.

Unsurprisingly, [faculty members](#) have the largest increase in new [scientific papers](#) as the result of additional funding. But in relative terms, the trainees—including graduate students and postdoctoral researchers—have a larger-percentage increase in papers they produce.

"We can see how research funding is jump-starting the careers of trainees who take what they learn while working on these funded projects, and the collaborators they met on the [grant](#), and start investigating other important issues," Weinberg said.

Funding for [biomedical research](#) tends to increase both the number of clinical papers directly tied to [patient care](#), and other types of [medical research](#), results showed.

These findings may provide the best view yet of how federal grants awarded for research are spent, Berkes said.

"Funders tend to focus, understandably, on the impact of their money on the specific issue they funded," Berkes said.

"But they should be aware of how their funding moves through a wide range of people and produces benefits they may have not expected."

Other authors on the study were Reza Sattari, a former postdoctoral researcher, and Jung Bae, a Ph.D. graduate, both from Ohio State.

More information: Reza Sattari et al, The Ripple Effects of Funding on Researchers and Output, *Science Advances* (2022). [DOI: 10.1126/sciadv.abb7348](#). www.science.org/doi/10.1126/sciadv.abb7348

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