NIH Center for Scientific Review

peer review notes

January 2018

In this Issue

Assuring the Integrity of Peer Review

"NIH has recently determined that there has been a breach in the integrity of the panel review process of a batch of applications," said Dr. Mike Lauer, Director of the NIH Office of Extramural Research.

"NIH takes the integrity of peer review seriously," he continued. "When its integrity is breached, it affects everyone."

"We regret that the dozens of affected applicants who did nothing wrong will face substantial delays in getting their applications reviewed and processed. We appreciate that the panel reviewers spent a great deal of time and effort reviewing dozens of applications, traveling, and participating in meetings. NIH must assure a fair process for everyone and will not stand by when the integrity of our peer review process is compromised."

"We also are grateful to the tens of thousands of reviewers and applicants who do play by the rules and who take as seriously as we do the critical importance of the integrity of our processes," he continued. "This case is a reminder for all of us that we must be ever vigilant."

Learn more by visiting the Open Mike blog and reading the recent notice to the community: Maintaining Integrity in NIH Peer Review: Responsibilities and Consequences.

Heads Up on New and Emerging Policies

Future Rigor and Transparency Policy Changes

NIH's Advisory Committee to the Director (ACD) was charged by Congress to help advance the rigor of NIH research. To this end, the ACD issued preliminary recommendations on advancing the rigor and transparency of NIH research in 2017. They include highlighting the rigor elements in the application (and possibly review criteria) by using headings and an unscored checklist. Other recommendations are to include rigor in training grants and to consider including rigor in the spectrum of ethics training. The final recommendations are being ironed out and must be submitted to NIH by June. NIH must then report to Congress by December 2018. Learn more by visiting the ACD web site.

NIH to Seek Your Input on a New Policy to Promote Data Sharing

Where's the Data? This spring, NIH will seek public comments on a draft policy to ensure that scientific data resulting from NIH-supported research are well managed and, to the fullest extent possible, made publicly available for secondary research purposes. Please watch for this request for information (RFI) and provide input that could be helpful in shaping a policy on this topic.

Sharing scientific data is a priority at NIH because it advances our mission by—

- Facilitating the validation of research results
- Allowing the analyses to be strengthened by combining datasets
- Providing access to hard-to-replicate data
- Informing future research
- Increasing the return on investment of scientific research
- Accelerating the translation of research results into knowledge, products, and procedures to improve public health
- Catalyzing businesses
- Improving transparency and accountability of publicly funded research

What Happened When NSF Had Applicants Do the Reviews?

In 2011, the National Science Foundation (NSF) launched a substantial effort to identify alternative approaches to the merit review of proposals. This effort was motivated by a significant increase in the number of proposal submissions, a cut in allowable reviewer travel expenses, and limited space for panel meetings. Recruiting reviewers also was becoming more difficult and time consuming, particularly with a requirement to adhere to conflict-of-interest policies.

"If you can't use the people who submit proposals to do review and if all the qualified reviewers submit proposals, who do you get to do review?" asked Dr. George Hazelrigg, the former Deputy Director of the NSF Division of Civil, Mechanical and Manufacturing Innovation.

Hazelrigg had long considered ways of using the applicants to review submitted proposals. Avoiding the conflict-of-interest this creates was the key stumbling block. But then, consulting with mathematician Dr. Donald Saari, retired Director of the Institute for Mathematical Behavioral Sciences, Hazelrigg found an approach based on mathematics of mechanism design or reverse game theory that imposes an "incentive" mechanism, which essentially removes a reviewer's incentive to bias their reviews in order to promote their own proposal.

How Did NSF Keep It Fair?

In a 2013 pilot, each applicant who wanted to be in the competition had to review seven of the incoming applications as ad hoc (mail) reviewers. "In addition to their written review and score, we asked them to rank order the proposals," said Hazelrigg. "If their rank ordering agrees with the group rank ordering, they get "bonus" points, which could shift their order in the ranking." NSF then used the resulting ranking as the "advice" of the reviewers in making award decisions.

How Well Did It Work?

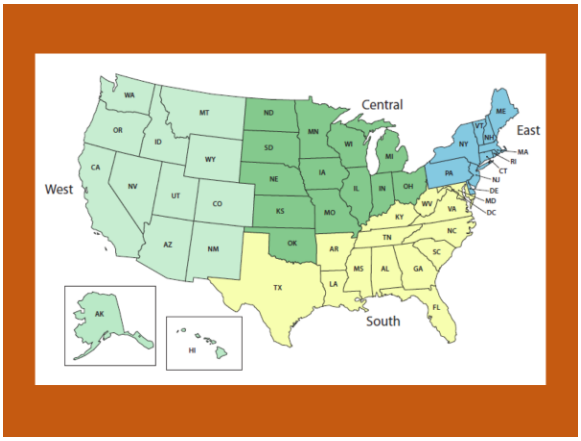
Despite a prediction that many applicants would not submit for this kind of review, NSF received about 60 percent more applications than the historical rate. Several applicants told NSF they thought the process would be fairer than the regular NSF panel review.

Interestingly, the reviews submitted in the pilot contained about 40 percent more words than reviews submitted for panel reviews, and an ad hoc program director evaluation found the quality of the reviews to be comparable to regular reviews. Despite the extra applications, the process significantly reduced the time needed to recruit reviewers, reduced staff workloads, and eliminated the need for reviewer travel and meeting room space. Hazelrigg also believes the process increased the quality of the applications. "Because applicants must perform significant reviewer duties, they have skin in the game," said Hazelrigg. "And they are not inclined to submit multiple proposals or resubmit minimally revised proposals that were previously declined."

What Do You Think?

This peer review method certainly appears to offer many benefits: applicants get more feedback and the burdens on reviewers and staff are lighter. But what do you think?

Do US Scientists from East and West Dominate NIH Grant and Peer Review Processes?



We often hear someone say applicants and reviewers from the East and West regions of the U.S. dominate the NIH research grant system. So we decided to examine our 2016 records and share what we learn.

What Are the East and West Regional Distributions?

As detailed in the attached table, we followed more than 45,000 Research Project Grant Applications (RPGs, mostly R01s and R21s). About half of them were from the East and West regions, with the other half from the Central and South regions. The Central and West regions submitted a lower proportion of the applications, each about 20%, while the East and South regions submitted about 30%.

We likewise analyzed more than 8,000 small business applications submitted in 2016. Here an increase was seen in the East and West regions, accounting for nearly 60% of the applications. However, the proportions were different, with East, South, and West regions accounting for about 30% each and the Central region at about 15%.

Are East and West Regional Reviewers Overrepresented on Study Sections?

When we looked at the RPG application reviewers -- more than 27,000 temporary and more than 7,000 regular (committed to 3x a year) -- we found nearly the same regional proportions as we found with RPG applicants: slightly less than half were from the East and West. For individual regions, reviewers from the East were a bit lower in proportion than applications, and conversely, reviewers from the South were a bit higher in proportion than applications. Thus, for RPGs, regional proportions of reviewers are close to those for applications, and evidence of East/West regional domination is absent.

Region	RPG Applications	RPG Awards	Ad Hoc Reviewers	Reg Panel Member Reviewers
Central	21.0%	20.8%	22.0%	22.6%
East	28.7%	31.5%	27.3%	26.8%
South	29.6%	26.3%	31.1%	27.9%
West	20.6%	21.4%	19.6%	22.7%
Puerto Rico and Virgin Islands	0.1%	0.0%	0.1%	0.1%
Grand Total	100.0%	100.0%	100.0%	100.0%

For small business reviewers, the situation was different. While the Central region with about 15% of the applications provided about 20% of the reviewers, the South region with about 30% of the applications provided nearly 35% of the reviewers. Thus, for small businesses, peer review proportions are somewhat unbalanced at the expense of those from the Central and South regions. However, again, this would not seem to favor domination by the East and West regions, quite the opposite.

Region	SBIR/STTR Applications	SBIR/STTR Awards	Ad Hoc Reviewers
Central	14.9%	14.7%	20.5%
East	26.2%	25.7%	25.4%
South	27.4%	25.6%	33.1%
West	31.3%	33.9%	21.0%
Puerto Rico and Virgin Islands	0.1%	0.2%	0.0%
Grand Total	100.0%	100.0%	100.0%

Do the Proportions Indicate any Misrepresented Areas?

Looking at individual states, we saw small variations, especially when the numbers and percentages are small. The largest lack of proportionality appears to be in the small business area in California from which about 20% of the applications arise, and also about 20% of the awards, but only 12% of the reviewers.

There are small variations in award rates which, given the very large sample sizes, may have $p < 0.05$, but the effects are very small and they cannot be due to recruiting reviewers from other areas. For both RPGs and small business reviews, more reviewers are recruited from the South than from any other region.

Conclusion

Overall, the proportions of applications, awards, and reviewers from the various US regions and states are rather closely in agreement. It is important to note that this is only partially by design, as the primary factor in selecting reviewers is expertise, not geography. Other factors come into play as well, including conflicts, diversity, and of course availability.

Navigating NIH Peer Review Videos for SBIR/STTR and AREA/R15 Applicants

CSR's has posted videos from our fall 2017 Navigating NIH Peer Review briefings for applicants seeking Academic Research Enhancement Award (AREA/R15) and Small Business Innovative Research (SBIR) or Small Business Technology Transfer (STTR) grants.

Each briefing includes presentations by a CSR official and the NIH official who oversees the respective program. A Q&A session follows.

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