



Who would you share your funding with?

I want to see whether the wisdom of crowds does a better job than conventional grant review at supporting research, says Johan Bollen.

Lawmakers in Chicago, Illinois, are readying a bill to test universal basic income. The idea is to give a fixed stipend to families without requiring reams of paperwork to assess eligibility. Advocates think that this streamlined system will allocate resources more fairly and with less bureaucratic bloat.

I propose that something similar could be used to fund science. In such a system, all qualified scientists would get some guaranteed funding — no grants required. But there should be one added step: everyone must anonymously allocate a fraction of their funds to other researchers of their own choosing.

The goal of this system would be to let scientists devote more of their time to research. The European University Association in 2016 estimated that the equivalent of at least one-quarter of Europe's Horizon 2020 funding programme goes to preparing grant applications (see go.nature.com/2vx3mjx). A 2013 study estimated that Australian scientists collectively spent more than five centuries of time preparing 3,727 proposals in 2012 (D. L. Herbert, A. G. Barnett and N. Graves *Nature* **495**, 314; 2013). Reviews might improve the quality of projects that are actually funded, but at what cost?

The scientific community is exploring ways of improving grant review, such as new evaluation systems or, as in New Zealand's Health Research Council, a modified lottery for promising proposals deemed both transformative and viable. But none of these substantially shrinks the bureaucratic burden. With current funding rates, researchers will continue to spend more time applying for grants with less-certain outcomes. That means less time doing science.

It is time to try something radical. I have spent the past five years trying to work out a crowd-based system, together with several colleagues. We call it Self-Organizing Funding Allocation (SOFA). Earlier this year, the Netherlands Organisation for Scientific Research held a workshop to plan a pilot test with SOFA, after the Dutch Parliament directed it to explore alternative modes of funding. Experts at the workshop agreed that the pilot project must be large enough — and last long enough — to make evaluation possible. We hope to publish evidence for, and a pathway to implement, this system within the next two years.

In SOFA, every participant starts with the same allocation of funding every year but must allot a portion to other scientists. Reasons to select someone could range from, 'That was a great paper' to 'I think they will release useful data.' Those who get the most give the most, because scientists give a percentage of everything received under SOFA. To avoid currying favour, this process will be anonymous.

Those who receive no donations still have their baseline. The 'baseline' and 'donation' cycles repeat every year. The distribution of

funding will reflect community consensus as to who deserves it.

SOFA retains the assumption at the heart of grant review that scientists know best who does good science, but it extends the process to all scientists instead of small review panels, and ensures a stable source of funding for early-career researchers. Funders can still develop grant programmes to encourage certain areas of research, such as neglected diseases or promising, risky new topics.

My team at Indiana University Bloomington ran a simulation assuming that all scientists funded by the US National Institutes of Health and the US National Science Foundation would donate to those they cited (J. Bollen *et al. EMBO Rep.* **15**, 131–133; 2014). This analysis of more than 100,000 investigators, 37 million papers and 770 million references yielded a hypothetical funding distribution surprisingly similar to that produced by grant review — without anyone submitting or reading a single application.

Of course, people don't always behave as predicted, as shown by the Brexit vote and the US 2016 presidential election. And freeing funding from proposals risks unleashing more sexism, racism and ableism than we already have.

We plan to build in precautions. We can limit collusions and kickback schemes — the financial equivalent of citation cartels — by mandating a minimum number of recipients and restricting people from designating frequent collaborators, or colleagues at the same institution. Counteracting gender, age and prestige biases that plague conventional peer review might even be easier in SOFA because they are measurable. Parameters

can be tuned to distribute funds according to desired criteria, for example, limiting repeated allocations to single institutions or individuals, and guaranteeing donations to under-represented groups.

Funders will need to define who gets to participate; perhaps everyone on a research track who is at an accredited institution and receiving a minimum salary. Otherwise, universities might be tempted to mint more professors and research associates. Also, without review panels, universities will need to be proactive to ensure that experiments fall within ethical guidelines and that scientists follow rules and fulfil obligations.

I understand scepticism that SOFA might not fund the highest-quality research: that friendship or flash might get in the way. But writing grant applications has already got in the way of doing research, and we owe it to science to find out whether this will work. The conventional proposal-based grant system might never have got off the ground had its adoption required the same level of proof we now seek. ■

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