Genome Biology

COMMENT

Sequestration: inadvertently killing biomedical research to score political points

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The US Congress just allowed the 'sequester' to happen, which means they cut the national budget for biomedical research by 8.2%. What happened to most people? Nothing. As many pundits have already written, the sky didn't fall, and the economy didn't collapse. 'We must cut spending!' they say, 'and look: nothing happened.'

So the budget cuts must be okay. We'll just trim some wasteful spending from all that research.

Congress, here's what 'nothing' looks like: in 5, maybe 10 years from now, someone you care about gets sick, maybe from cancer. The only treatments are painful and not very effective, so the doctors decide the best option is to do nothing. Or maybe, 10 years from now, you have your first grandchild, but she is born with a life-threatening genetic disease. No treatment is known, so the doctors tell you and your children that nothing can be done.

That's what 'nothing' looks like. If we take only a short-term perspective, cutting the NIH and NSF research budgets won't seem to change anything outside of the scientific community. So the pundits are right: the sky won't fall, and the economy won't collapse. And in the long term, we'll have nothing.

So what will happen?

Well, most university research in the US is funded by 3- to 5-year grants from the federal government. Even at 3 years, it is difficult for scientists to plan: it takes about a year to get a grant, which means that when you get a new 3-year grant you only have 2 years to generate results before you have to apply for another one. And when you get a grant, it often takes time before you can find someone qualified to do the work (someone who you may have to train).

Due to uncertainty about sequestration, the NIH funded almost nothing new in the period from September until March, waiting to find out if the sequester would really happen. Literally thousands of biomedical researchers across the country have scrambled to keep funding their labs, waiting for decisions from NIH. As the cuts take effect, many of these labs will be forced to freeze hiring, cut back on experiments and reduce their scientific output.

The uncertainty is particularly devastating to young scientists. New PhD graduates continued to apply for jobs, but the jobs just haven't been there. 'Wait a while,' some of us said. 'We might have funding in the spring.' Some of the best young scientists won't wait: some have already gone to industry, and some might leave science entirely, discouraged over the sad state of fiscal uncertainty that now seems to be permanent. When highly skilled scientists leave the field, we've lost something that we will never get back.

Meanwhile the cuts from sequestration paint an increasingly grim picture for new investigators just starting their independent careers. These scientists have already poured years into training to build up enough expertise, experience and ideas to build entirely new scientific groups. But this is the most precarious time for a young scientist as they are asked to obtain and maintain funding on their own for the first time. Already, due to the sequester, the NSF announced that over 1,000 new grants will not be awarded. At the same time, the NIH may fund as few as 6% of the grants that are submitted in 2013 (http://www.einstein.yu.edu/administration/grant-support/nih-paylines.aspx) and ongoing grants may be reduced (http://nexus.od.nih.gov/all/2013/03/04/nih-operations-under-the-sequester/). The result is that it may go from being really hard to nearly impossible to get grants. If these young scientists can't support their work, we won't just lose the experiments they were going to perform this year. We may lose an entire generation of young scientists, leading to reduced American productivity in science that could last for decades (http://www.theatlantic.com/politics/archive/2013/03/the-sequester-is-going-to-devastate-us-science-research-for-decades/273925/).

The worst part: they don't really mean it!

One of the more frustrating elements of the sequester fight is that no one in Congress seems to be in favor of

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pulling the rug out from under biomedical research. But due to their own inability to agree on larger budget issues, they are doing it anyway. And it's not just the sequester: the latest cuts come on top of a multi-year freeze in NIH funding, in which annual budgets have been flat or declining in real terms.

Science doesn't operate on a short-term basis. Cures for major diseases take years, often decades, to develop. And within the field, we can see tremendous progress on many fronts. Our understanding of cancer, heart disease, infectious diseases, aging, genetic diseases and a host of other conditions is moving ahead in leaps and bounds. This is the time to invest more, not less.

Although these cuts are devastating to NIH research, in the context of the US budget, they won't affect a thing. The entire NIH budget (http://www.nih.gov/about/budget.htm), supporting research on hundreds of diseases, is about $31 billion. The total US budget last year was $3.7 trillion. Thus an 8.2% cut from NIH saves just 0.07% of the federal budget. Or to put it another way: the Pentagon program to build the F-35 Joint Strike Fighter, which won't be ready until at least 2019, is already estimated to cost $400 billion (http://www.gao.gov/assets/660/652948.pdf), equal to the entire NIH budget for 13 years. And that's just one plane.

What's more, NIH funding is a terrific investment. A nonpartisan study in 2000 (http://www.faseb.org/portals/0/pdfs/opa/2008/nih_research_benefits.pdf) found that publicly funded research yields a return of 25% to 40% per year. Where else can you get that kind of return on anything? But because this is a long-term investment, private businesses won't fund it, although they too benefit from the stream of discoveries and new technologies supported by public research funds.

We recently bailed out Wall Street because it is 'too big to fail.' Our biomedical research enterprise is not too big to fail – financially, that is. But how sick do we have to get before we decide we shouldn't have cut our investment in biomedical research?

Congress can do many things to show that they care about curing disease. If they really do care, they should first restore NIH's budget for this year. Then they should take action to insulate biomedical research from the endless, internecine battles between the parties. A good first step would be to approve multi-year funding plans for NIH and NSF, just as these agencies award multi-year grants to scientists. The default action should leave these multi-year plans in place. So the 'do nothing' option each year wouldn't cut the legs out from under active research projects, but instead would ensure at least level funding from year to year.

By the time scientists reach the point where they can lead productive research programs, we've already invested heavily in their training. Let's not kick them out on the street because someone in Congress wants to score political points. The health of the nation deserves better.

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Published: 27 March 2013

doi:10.1186/gb-2013-14-3-109
Cite this article as: Leek JT, Salzberg SL: **Sequestration: inadvertently killing biomedical research to score political points.** *Genome Biology* 2013, **14**:109.