

Marching for science as budget cuts threaten US research

Academics push back against President Trump's proposed budget cuts, which give a sobering insight into the future of US research. Susan Jaffe, *The Lancet's* Washington correspondent, reports.

President Donald Trump is famous for his early morning Tweets and off-the-cuff remarks that can sometimes be puzzling. But what he thinks about biomedical research and basic science is quite clear in his first proposed budget for running the federal government.

Trump's *America First: A Budget Blueprint to Make America Great Again* outlines a \$1.1 trillion spending plan that would take effect when the new fiscal year begins in October. The president wants to move \$54 billion from domestic agencies to fortify the US military. To pay for the transfer, he is proposing funding cuts for the US Environmental Protection Agency (EPA; 31%) and the National Institutes of Health (NIH; 18%). The Department of Energy would get a 6% cut, including \$900 million cut from its Office of Science that supports research at national laboratories and universities and the elimination of its Advance Research Projects Agency, which promotes energy research. The National Aeronautic and Space Administration would lose about \$100 million. There is no mention of the National Science Foundation but it could also face cuts when the Trump administration unveils more details next month.

Even though this budget must still be approved by Congress—which is sure to make changes—the president's intentions are reinforced by the people he has selected to run certain federal agencies. EPA administrator Scott Pruitt, for example, continues to doubt whether human activity contributes to climate change and has hired top officials for the agency who are equally sceptical. Trump's pick to head the Department of Health and Human Services (HHS), physician and former Georgia congressman Tom Price,

remains a strong opponent of the Affordable Care Act and has defended budget cuts for the NIH, an agency within HHS he oversees.

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Even proposed NIH cuts can have a real effect that worries the agency's supporters, and spurred many to join last week's March for Science, rallies which happened in more than 600 cities around the world. The proposal is an unambiguous statement of intent, said Harold Varmus, who directed the NIH in the 1990s and headed the National Cancer Institute at NIH for 5 years until 2015. It sets out the administration's priorities and how it expects to govern.

To squeeze \$5.8 billion—or about 18%—out of the agency's \$30.3 billion budget, the Trump administration would reorganise NIH's 27 institutes and centres and “rebalance federal contributions to research funding” according to the budget blueprint. Trump's budget would close the Fogarty International Center, established by President Lyndon Johnson in 1968, which promotes research programmes with about 5000 scientists in more than 100 countries. It would also fold the Agency for Health Quality Research to the NIH to “reduce or eliminate the duplication and redundancies”, Price told at a congressional hearing last month. The agency has a \$334 million budget and does research to improve the health-care delivery system.

The administration's budget cuts target redundant or wasteful spending to get “a bigger bang for our buck”,

said Price at the hearing. For example, he said that the NIH could operate on a tighter budget by cutting the roughly 30% of grant money that pays for indirect research costs. These expenses can include rent, utilities, administrative staff, and equipment. “That money goes for something other than the research that's being done”, Price said. Varmus said Price's suggestion was especially disturbing coming from the person who is responsible for overseeing the NIH. “You can't do research in the dark”, he said. “You can't do research—at least my kind of research—without a building and without electricity and water and administrative expenses”.

Mike McCune, a professor of medicine at the University of California, San Francisco, has received multiple NIH grants for his HIV/AIDS research. If those grants did not cover indirect costs, he would probably have had to lay off some of the people who work in his lab. Years ago, his students “used to see a bright future in academic research but today, that's not the case”, he said. “That's probably to me the most insidious and dangerous part of these proposals.”



On the ground: the March for Science in Washington DC, USA, on April 22, 2017

Budget negotiations

The administration's budget proposal also affects negotiations between the White House and Congress, which must reach a consensus on a final budget. The \$25.9 billion proposed for the NIH sets a very low starting point for negotiation, said Varmus, now a professor of medicine at the Meyer Cancer Center of Weill Cornell Medicine in New York City. "That worries me a lot because negotiations should begin in my view with a request for moderate increases", he said. "The cost of doing research has gone up, especially in cancer research and the change in the practice of oncology in the past decade has been unbelievable. Why cut back now?"

Work on the budget that would take effect on Oct 1, is already running late because, among other reasons, Congress is still trying to finish last year's budget. A short-term budget agreement last year expires at the end of this week. Without another short-term budget for May through September, the federal government would shut down. As this article went to press, the president was asking Congress to approve increases in military spending and money to begin work on a controversial wall on the Mexican border. He was also asking for an additional spending cut of \$1.2 billion for the NIH—roughly 4%.

"From my experience in government, it is unprecedented for a further cut to be discussed in the middle of the fiscal year", said Varmus. Reducing thousands of grants mid-year creates big problems. "You don't want to cut off funding for existing labs and you don't want to restrict the number of new investigators who can get started this year", he said.

A White House official assured *The Lancet* that "the administration supports the pursuit of science, free and open debate, and scientific advancement that will improve the lives of all Americans". An example of its latest efforts to pursue these goals is the decision to host a student

science fair at the White House later this year, the official said, an annual competition begun during the Obama Administration.

In his inaugural address last January, the president acknowledged, "We stand at the birth of a new millennium, ready to unlock the mysteries of space, to free the Earth from the miseries of disease, and to harness the energies, industries, and technologies of tomorrow". Yet support for such goals should not be measured only by how much the Trump Administration spends to achieve them, another official has said.

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Shortly after the budget blueprint was unveiled last month, White House spokesman Sean Spicer was asked why the president was recommending NIH cuts when he also supported medical research. "Only in Washington do you literally judge the success of something by how much money you throw at the problem, not actually whether it's solving the problem or coming up with anything", Spicer replied.

Defending the NIH

The congressional response has been less than enthusiastic. "Right now we're seeing zero support in Congress for that 18% cut", said Jennifer Zeitzer, legislative relations director at the Federation of American Societies for Experimental Biology, which represents 30 professional scientists' associations.

Oklahoma Republican Tom Cole, who chairs a House of Representatives committee that reviews the NIH budget, and Missouri Senator Roy Blunt who heads a similar Senate committee, have reportedly said they will back legislation providing \$2 billion more for the NIH next year. "Still, the president's budget

sends a signal to Capitol Hill that this administration thinks the NIH is overfunded", said Zeitzer. A new president who thinks the NIH doesn't need additional funding, and in fact wants to cut funding, "is incredibly demoralising for the research community", she said.

Yet it has also spurred a new wave of activism "out of the labs"—to quote a popular sign at last week's March for Science—"and into the streets". Shaine Morris, a paediatric cardiologist and NIH grant recipient at the Baylor College of Medicine, Houston, TX, travelled to Washington, DC, to attend the march. "We have improved cardiac disease [treatment] in children a lot, but there is a lot further to go", she said. "There are a lot of kids who are still dying, a lot of kids who have problems we can't predict and...we need to figure out a way to help them."

Washington marchers passed by EPA headquarters, where Wendy Thomi, an environmental scientist, specialises in hazardous waste clean up. She attended the march because "my life is dedicated to science...I love the agency and I think it is doing really important work".

Sheila Briggs, Thomi's 22-year-old niece, will receive an undergraduate degree in chemical engineering from the University of Idaho in May. "As a young person I think we need to stand up for what we want to do and keep persevering even if the government is not going to be there to support us."

But other march participants would have been glad to stay at home. Kent Kirschenbaum, a professor of chemistry at New York University (NYU) who also works at NYU's Cancer Center, helped conduct a teach-in before the Washington, DC, march. Kirschenbaum did not carry a sign but if he did, it would read, "I'd rather be curing cancer", he said. "I'd rather be in my lab, engaging with my students."

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