Trump's second administration's impact on US science

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Donald J. Trump was sworn in for a second term as president of the United States on January 20, 2025, and soon after, his administration began changing the established system of government-funded scientific research and development. Although the range of the administration's interventions has been broad, reductions in funding appear to be the common denominator for most of them. The administration has justified its actions as part of the larger program of rooting out "fraud, waste, and abuse" in the government.[1] The administration's critics, not least the researchers whom the funding cuts would affect, have spoken about the administration waging a "war on science."[2]

The battle of withering words shows that the administration's actions are controversial. There are vehement disagreements about their wisdom and their consequences among American politicians and the American public. Since the changes have been and will continue to be contested, legally and politically, many may not be permanent, even if their impact has already been felt. The future of the system still remains undecided. So far, this has been a political fight, not an orderly reform.

This essay's goal is to go a little behind the headline slogans surrounding this fight and present the events and the future possibilities in some detail and with some context. Its focus will be on the impacts on research in biomedicine, in the physical sciences and astronomy, and in atmospheric science.

This report is meant as a sketch for orientation purposes, not as an authoritative survey. The scale and diversity of U.S. R&D are almost beyond imagining; the government tools and policies involved in its regulation and support are manifold; the accounting devices used are intricate; the

[1] For example: "Fact Sheet: President Donald J. Trump Stops Wasteful Grantmaking," *The White House*, August 7, 2025, https://www.whitehouse.gov/fact-sheets/2025/08/fact-sheet-president-donald-j-trump-stops-wasteful-grantmaking/ , accessed 8/19/2025.
[2] Benjamin Mueller, "Trump Administration Has Begun a War on Science, Researchers Say," March 31, 2025, NYT, https://www.nytimes.com/2025/03/31/science/trump-science-nas-letter.html accessed 7/31/2025; "Science and Democracy under Siege," Union of Concerned Scientists, https://www.ucs.org/resources/science-and-democracy-under-siege#:~:text=At%20the%20Union%20of%20Concerned,us%20and%20stymie%20valuable%20innovation. Accessed 7/31/2025.

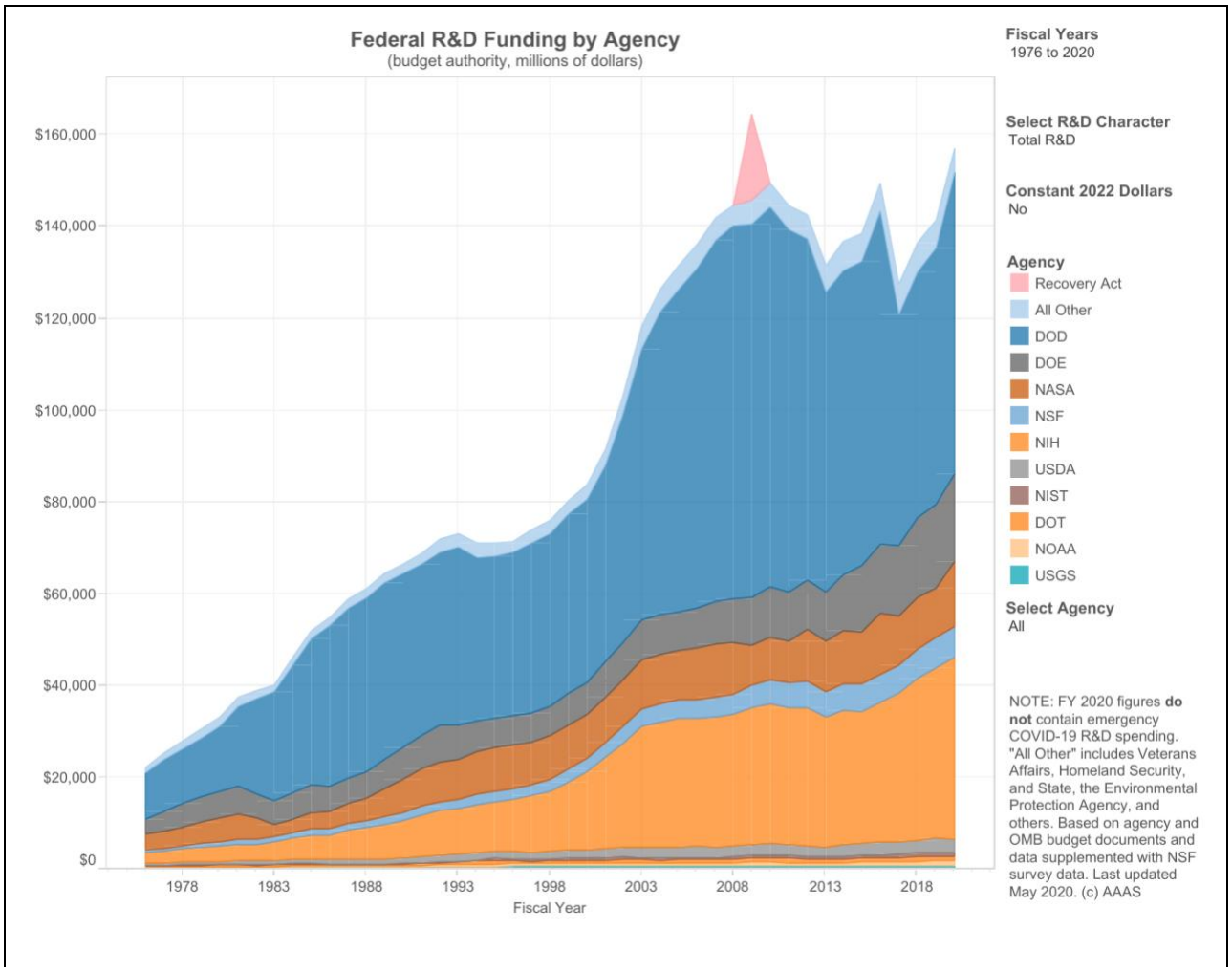
actions and reactions have been taking place across a broad front. The pace of events has been so unrelenting that the latest information cited in this piece can soon become obsolete.

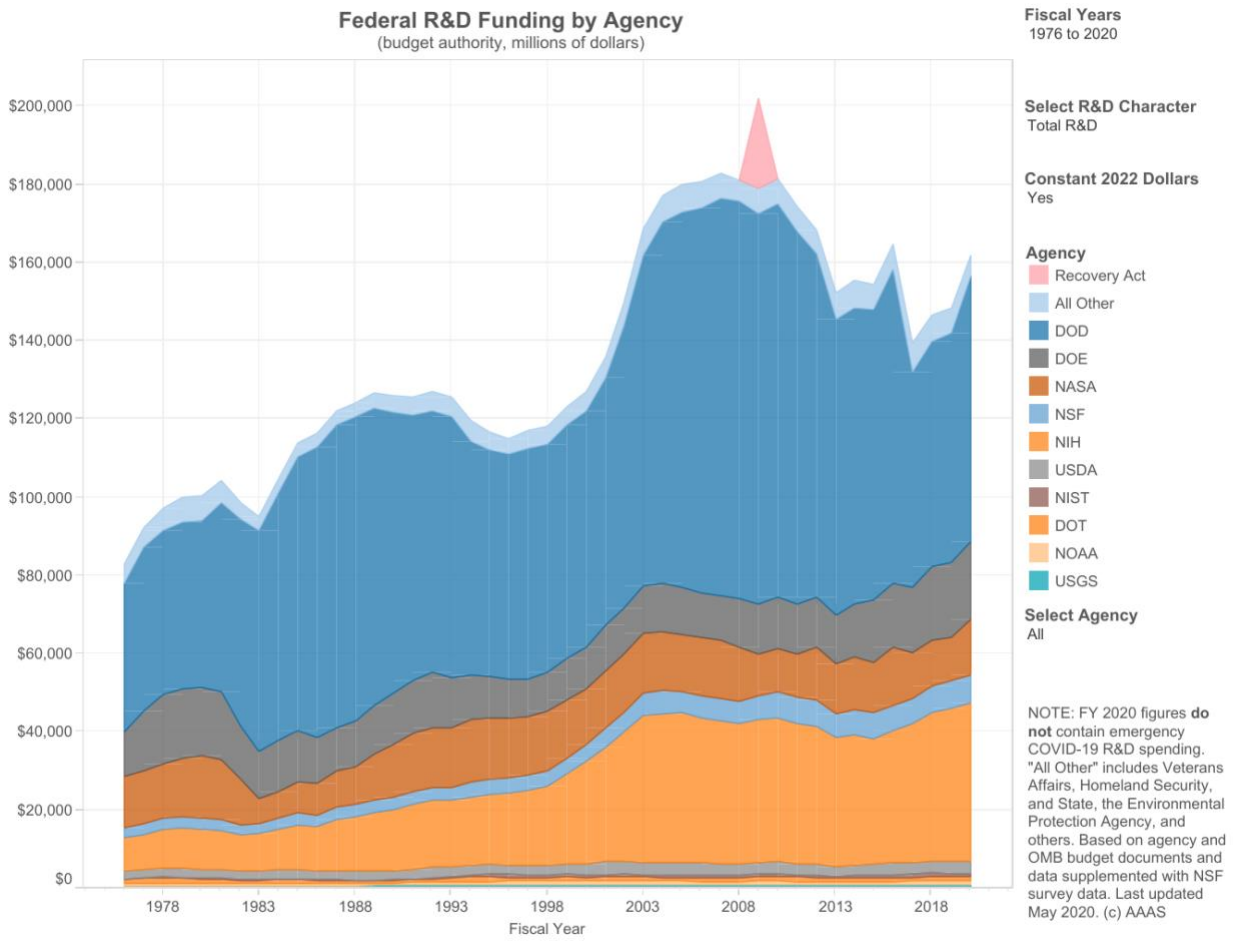
Challenging the status quo

One of the remarkable things is that the Trump administration has been targeting the R&D sector at all. The government policies on R&D support have been quite stable for decades, backed by an apparent consensus about the system's essential health and usefulness. The long-term trend is one of the U.S. government's increasing its financial support for R&D.[3] Government R&D funding usually sees year-on-year increases in nominal dollars, and even when the dollar figures are adjusted for inflation, occasional annual decreases have usually kept within single percentage digits. Most fluctuations in the government's R&D spending over the past few decades were due to fluctuations in defense R&D outlays, driven probably by the fluctuating (because politically sensitive) national security priorities and the R&D lifecycles of funding-intensive items such as multibillion weapon systems. The trend has been steadier in non-defense R&D spending, the funding climbing slowly but surely. It deserves to be pointed out that the *share* of R&D funding in overall government funding has *not* been rising (the growth of overall government spending has been exceeding its R&D spending), leading some commentators to point out that by that metric the government's commitment to R&D has been stagnant or declining.[4] But the fact remains that the system of federal R&D funding has not experienced drastic cuts, especially in nominal dollars, for many decades.

[3] For historical trends in R&D funding by the US government, see https://www.aaas.org/programs/r-d-budget-and-policy/federal-rd-budget-dashboard and https://www.aaas.org/programs/r-d-budget-and-policy/historical-rd-data

[4] Under https://www.aaas.org/programs/r-d-budget-and-policy/historical-rd-data, see datasheet "R&D as a Percent of the Total Federal Budget, 1962-2020," https://www.aaas.org/programs/r-d-budget-and-policy/historical-trends-federal-rd#:~:text=the%20Total%20Federal-,Budget,-%2C%201962%2D2020 , accessed 07/31/2025.





U.S. Government funding for R&D 1976-2020, in nominal dollars (top), and constant (2022) dollars (bottom). Source: https://www.aaas.org/programs/r-d-budget-and-policy/federal-rd-budget-dashboard (accessed July 31, 2025)

The arguments in favor of generous government support for R&D are familiar: U.S. leadership in science creates international prestige and attracts international talent; there is a direct pipeline from strong basic research via strong applied research to the development of cutting-edge technologies and the attendant economic and military advantages; superior science, technology, and medicine allow the United States to dispense benign assistance around the world; every dollar invested in R&D brings multifold return on the investment. In short, funding U.S. science at a high level makes it the envy of the world, promotes and maintains U.S. superiority, creates wealth, and benefits everyone.

In its declarations, the Trump administration agrees that U.S. leadership in science and technology is a good thing but challenges the idea that the system established to achieve it is healthy and efficient. The administration has proposed and pursued radical changes to the system: it has terminated many existing research and training grants; it has proposed significant cuts to grants it has not terminated; it has blocked all grants to certain leading universities such as Harvard; it has begun to or plans to close down government research facilities and terminate science-based public services; it has reduced staff levels at the government's scientific agencies.

In the coming fiscal year, it proposes to cut federal funding for all R&D by 22% and basic research in particular by 34%.[5]

Eliminating fraud, waste, and abuse is a general mantra the administration uses to explain its policies. But fighting fraud, waste, and abuse is surely everyone's goal; it does not explain why this particular administration pursues the particular cuts it does. It is necessary to understand a more complex vision behind the cuts to make sense of them, to understand how the administration defines "fraud, waste, and abuse."

The administration has not been articulating its broader vision extensively, but the vision is clearly based on challenging the status quo, which means rejecting old answers to fundamental questions and proposing new answers. Captured at least approximately, those new answers might go as follows: How much money should the people's government devote to funding research and development? The administration says, "much less than we, the people, have been." What has been the public benefit derived from past funding? The administration says, "from much of it, much less than has been claimed and believed." Who should decide what research is pursued? The administration says, "not scientists, but elected agents of the people and practically motivated corporations." Why? The administration says, "scientists are intellectually and ideologically corrupt; they pursue ideological hobbies, prop up false dogmas, foment ivory-tower hysterias, or just follow idle curiosity and self-interest. They are not to be much trusted." What type of research should be funded? "The kind that is useful to society, the kind that either meets people's practical needs, or the kind that redounds to the nation's power and glory." What bodies should perform it? "Less of it should be done by universities and the government, and more of it by private corporations kept honest by the market: let them take on the risks and the burdens, reap the rewards, and benefit society at the same time, as they are wont to." Which individuals shall perform it? "Our people, not foreigners whose loyalty to our national interests cannot be assumed; and our people shall compete for the privilege on merit alone."

Trump's R&D policy up to now (FY2025) and in the future (FY2026)

In the United States, the amount of government funding for R&D is mostly defined at the level of the US discretionary budget. US discretionary budgets are negotiated anew and passed into law every year by the Congress.[6]

The current fiscal year, FY2025, runs from October 1, 2024, to September 30, 2025. R&D funding during that period would normally be determined by the 2025 discretionary budget. There is a wrinkle, however. It happens with some regularity that during a given year, budget negotiations are not completed because of unreconciled political differences, and a new discretionary budget is not approved; in such cases, the Congress usually extends the budget

[5] 2026 cuts: see https://www.nytimes.com/2025/07/10/science/trump-science-budget-cuts.html ; https://www.aaas.org/news/fy-2026-rd-appropriations-dashboard .

[6] Discretionary budgets differ from so-called mandatory spending, which represents a majority of the U.S. government's financial outlays—on health care, old-age pensions, military expenses, and others—but does not have to be renegotiated annually. In 2024, mandatory spending accounted for 61% of the $6.8 trillion the federal government spent in total, discretionary spending for 26%, and interest payments on the national debt 13%. (Source: https://usafacts.org/answers/how-much-does-the-us-federal-government-spend/country/united-states/, accessed 7/31/2025.) Other laws may also "appropriate" (i.e. legally claim and authorize) funding for R&D, which then supplements the discretionary annual R&D budgets, for example the CHIPS and Science Act (CaSA) of 2022.

from the previous fiscal year. That is the case for FY2025: the 2025 budget was never adopted, and so the government currently operates on the basis of funding that was approved for FY2024 and then extended for another year.

The amounts and allocations that the government should be spending on R&D in FY2025 are therefore those specified in the 2024 discretionary budget, where they total **$194.6 billion**. The key word, however, is "should." Trump's team started cutting R&D funding immediately, even though the R&D budget had been inherited from the previous administration, and, by custom, should have been allowed to mostly run its course through the end of the fiscal year in September 2025. That budget was thrown out of the window; the new administration took the unprecedented step of reducing or cancelling existing Congress-funded research grants *en masse*. Many of those grant cuts were subsequently blocked or reversed by the courts, but not all of them; and even those that were eventually reversed were in place for weeks or months and had an impact. These cuts and disruptions, as well as the staff cuts at governmental science agencies and blanket actions taken against some universities represent the short-term effect of the administration's policies. A large part of this report is dedicated to such cuts. They have all happened, real people and projects have been affected, the stories have a human face. At the same time, they offer insight into the administration's priorities.

But it is equally important to consider a longer-term perspective. The changes made so far are still only edits of the existing funding system set forth in the previous budget. The Trump administration now looks ahead, to the next budget, which it can shape. In May 2025, it submitted a budget proposal for financial year 2026.[7] The President's 2026 budget proposal goes far beyond the cuts made so far. It is a radical departure from recent R&D budgets, proposing a 22% overall reduction in R&D spending, as mentioned earlier.

A United States president does not decide what the budget will be. The U.S. Constitution gives the power to determine how government revenue is raised and how it is spent to the Congress (the Congress has "the power of the purse"). The budget is negotiated between the administration and the Congress, and among representatives and senators within the Congress, and the Congress must ultimately approve it as law. The negotiations take weeks and months.[8] No one has a crystal ball; what the final R&D budget for FY2026 will look like remains to be seen. Many commentators say that the 22% R&D cuts proposed by the administration are unlikely to be implemented in the final budget.[9] To pass into law, a discretionary budget needs to win a supermajority (60 or more votes out of 100) in the U.S. Senate where the President's Republican Party does not have a supermajority. The budget would have to appeal to at least some Democratic senators, not to mention nearly all Republican senators, which suggests there will be a compromise. Alternatively, a bill may not be passed at all, just as it failed to pass for FY2025,

[7] The President's FY 2026 Discretionary Budget Request, https://www.whitehouse.gov/omb/information-resources/budget/the-presidents-fy-2026-discretionary-budget-request/ , accessed 5/29/2025.
[8] https://www.aaas.org/news/fy-2026-rd-appropriations-dashboard is a dashboard created by the American Society for the Advancement of Science (AAAS) tracking the latest data on 2026 R&D budget negotiations.
[9] The Senate's Appropriations Committee has already countered with its own discretionary budget proposal which rejects R&D cuts. Aris Foley, "Senate panel advances more than $1 trillion in government funding for 2026," The Hill, 07/31/25, https://thehill.com/business/budget/5430430-senate-appropriations-defense-lhhs-funding/ , accessed 8/19/2025; Jocelyn Kaiser, "With boost to NIH budget, Senate panel rejects Trump's plan to slash agency," Science, 31 Jul 2025, https://www.science.org/content/article/boost-nih-budget-senate-panel-rejects-trump-s-plan-slash-agency , accessed 8/19/2025.

and the FY2024 budget will be extended for yet another year. However, the president's team and its supporters in the Congress have so far given little indication they accept compromise or feel bound by past budgetary decisions; and the possibility that the R&D funding will in fact be reduced to the levels specified in the president's proposal must be taken seriously.

Background: the government is not the main R&D funder but funds most of the basic research

First, we need to understand the role that the U.S. federal government plays in the overall R&D funding. Useful summaries of the state of R&D in the United States are published by the National Science Board (NSB); the most recent came out in 2024 and analyzed data up to 2022.[10]

From the NSB report, it is clear that the US government is not the main funder of R&D in the country, lagging far behind private business on aggregate. In 2022, the total cost of R&D in the United States was estimated at $885.5 billion. Of those funds, the federal government provided 18% ($159.8 billion) while the business sector funded 76% ($672.9 billion)—more than 4 times as much.[11] The sources of the remaining 6% included higher education institutions, at about 2.9% ($25.5 billion), nonprofit organizations (such as philanthropic foundations), at about 2.4% ($21.4 billion), and non-federal governments, at 0.7% ($5.9 billion).

While the government's share of R&D funding comes a distant second to the share taken up by the private sector, it is still a major player, especially in certain areas. The three main R&D areas are traditionally defined as basic research, applied research, and experimental development, and the government's importance varies across them. In 2022, the federal government was the biggest funder of basic research in the US, accounting for 40% of the funding, edging the business sector's 37% contribution ($129.4 billion was spent on basic research in total). In contrast, the federal government's contribution was relatively smallest in experimental development ($596.2 billion spent in total), where business-dispensed funds accounted for a whopping 88%. Yet that is not to say that the government has been funding basic research preferentially; in fact, in 2022, it divided funds among the three areas quite equally: $62 billion for experimental development, $51 billion for basic research, and $46 billion for applied research. It is its relative contributions that vary more widely, since the experimental development sector used up much greater funds than either basic or applied research.[12]

Other sources provide even more recent information. For example, President Biden's budget proposal for FY2025 cited figures on R&D spending up to 2024. There was actually a remarkable 22% increase in overall spending from 2022 to 2024, driven mostly by dramatically

[10] *The State of US Science and Engineering 2024*, March 2024, NSB-2024-3, https://ncses.nsf.gov/pubs/nsb20243 . The report is downloadable at https://ncses.nsf.gov/pubs/nsb20243/downloads . Also *Research and Development: U.S. Trends and International Comparisons*, May 21, 2024, NSB-2024-6, https://ncses.nsf.gov/pubs/nsb20246 and http://ncses.nsf.gov/pubs/nsb20246/downloads . All accessed 8/4/2025.
[11] *Research and Development: U.S. Trends and International Comparisons*, p. 7.
[12] 2022: experimental development used up $596 billion, applied research $160 billion, and basic research $129 billion. *Research and Development: U.S. Trends and International Comparisons*, pp. 17-20. While a majority of R&D has been performed in the business sector for many decades (>60% for every year going back to the 1950s), the federal government was the biggest overall funder of R&D until the early 1980s; in other words, the federal government used to provide much or even most of the funding for business-based R&D. Pp. 13 and 14 ibid.

increased government funding for experimental development. The total government R&D funding reached the $194.6 billion noted above, of which $95 billion went to experimental development, $48 billion to applied research, and $46 to basic research.[13] One might see the Trump administration's proposal to cut the government R&D budget in 2026 as an attempt to reverse those most recent increases and restore the prior levels of funding, but, on closer look, that is not the case: the Trump proposal cuts mostly basic and applied research.

Distributing the funds, agency by agency, research area by research area

The money appropriated for R&D funding is disbursed by several government agencies. For FY2024, the biggest conduit of government R&D funding was the Department of Defense (DOD), which funds a variety of defense-related projects that span the range from basic research on the physical chemistry of metal corrosion to the development of new ballistic missile systems. Even though much of DOD's R&D budget goes to the development of weapons systems, it is also a major sponsor of engineering, computer science, and materials science research performed in the country. Biomedical research is mostly funded through the National Institutes of Health (NIH), an agency within the Department of Health and Human Services (HSS). In 2024, the total amount of awards disbursed by the NIH was second only to DOD awards. The Department of Veterans Affairs (DVA), NSF, and DOD also fund some biomedical research. The Department of Energy funds nuclear science and engineering, as well as energy R&D concerning both fossil and renewable energy sources. The National Science Foundation (NSF), an independent government agency, disburses mostly funds for nonbiomedical sciences and engineering, as well as some funds for biology research. The well-known National Aeronautics and Space Administration (NASA), an independent agency, funds both space and earth science R&D. The National Oceanic and Atmospheric Administration (NOAA) within the Department of Commerce (DOC) funds marine and atmospheric research. The National Institute of Standards and Technology (NIST) within the same department funds measurement science and technology. The U.S. Department of Agriculture (USDA) funds R&D projects related to agricultural science and technology, including food safety. The U.S. Geological Survey (USGS) within the Department of the Interior (DOI) funds earth science research, including the study of mineral and water resources. The Environmental Protection Agency (EPA), an independent agency, funds research and technology relevant to environmental pollution and its control. A few other offices (the Department of Transportation, the Department of Homeland Security, the Department of Education, Smithsonian Institution) also disburse R&D funds.

The table below summarizes estimates for R&D expenses allocated through federal departments and agencies in the financial year 2024.[14]

Department/Agency	FY2024 estimated ($ million)
Department of Defense	90,632

[13] *Federal Research and Development (R&D) Funding: FY2025* (the President's FY2025 R&D proposal), December 9, 2024, Congressional Research Service, R48307, https://www.congress.gov/crs-product/R48307, Table 2, p. 6, accessed 8/4/2025. Comparing 2022 with 2024, we see the following shifts in nominal dollars (in billions, 2022→2024): total R&D 159.8→194.6, basic 51→46, applied 46→48, experimental 62→95.

[14] *Federal Research and Development (R&D) Funding: FY2025* (the President's budget proposal), December 9, 2024, Table 1, page 5. Note that the figures in the table are for R&D expenses only; the total NIH or NSF budgets, for example, were larger.

Department of Health and Human Services (NIH)	47,591
Department of Energy	22,237
National Aeronautics and Space Administration	11,797
National Science Foundation	7,800
Department of Agriculture	3,379
Department of Commerce (NOAA, NIST)	3,930
Department of Veterans Affairs	1,799
Department of Transportation	1,462
Department of the Interior (USGS)	1,258
Department of Homeland Security	634
Environmental Protection Agency	568
Department of Education	446
Smithsonian Institution	347
Other	684
Total	194,564

The rest of this report will provide a closer look at what has been happening at a few select agencies. Most of the analysis will be devoted to NIH, and briefer overviews and commentary will be provided for NSF, NEAA, NASA, and DOD.

The Trump administration and the National Institutes of Health

The National Institutes of Health are an agency within the Department of Health and Human Services (HHS). Research supported by NIH consumes a large share of the government's R&D outlays, behind only DOD-funded R&D. In fiscal year 2024 (whose funding levels, as noted above, extended to FY 2025 as well), the NIH's discretionary budget was $48.6 billion,[15] of which $47.6 million was dedicated to R&D, 24% of the overall federal R&D funding (see the table above). NIH distributes the federal funds further downstream through specialized subagencies to research "performers": NIH's own facilities such as the National Cancer Institute, higher education institutions (universities and medical schools), and non-university external research facilities (such as Memorial Sloan Kettering Cancer Center).

NIH supports primarily biomedical research, which suggests it focuses on applied science, but much of the research concerns basic biological mechanisms whose understanding may not lead to immediate practical application (i.e., "basic research"). By the some taken, basic research supported by NIH is likely essential to developing many practical applications in the future. Most of the NIH grants go toward basic and applied research, about equally to each.[16] Other

[15] pp. 28-29, *Labor, Health and Human Services, and Education: FY2024 Appropriations*, Congressional Research Service, updated November 4, 2024, https://www.congress.gov/crs-product/R47936 . In FY2025 President's Budget Proposal, that figure is slightly different, $48.8 billion, but perhaps because it includes some mandatory bits. See *Federal Research and Development (R&D) Funding: FY2025* (the President's budget proposal), December 9, 2024, Table 9, pp. 21-22.

[16] *Federal Research and Development (R&D) Funding: FY2025* (the President's budget proposal), December 9, 2024, Table 3, p.7. The table shows funds for HSS as a whole, but NIH accounts for a great majority of HSS

government agencies fund biomedical research as well, though to a lesser extent: DVA, DOD, and NSF.

NIH is one of the jewels in the crown of US science, symbolizing US's scientific world leadership (though, in fairness, US science is world-leading in most fields). It has already experienced cuts, and, if the administration has its way, will be cut severely going forward. Within the NIH cuts, I will focus in detail on cuts to HIV/AIDS-related research which so far has been a particularly frequent target of grant award cancellations.

A problem with calculating the cuts

It would be nice to be able to conclude something along the lines of "the administration has reduced R&D funds for 2025 available through NIH by such and such percentage." But calculating the funding cuts directed by the administration is difficult.

The picture is fragmented at best, for a variety of reasons. The NIH directive to reduce reimbursements for "indirect costs" used an ambiguous formula for calculating those costs, and its implementation was blocked by the courts after about two months. Information on targeted grant cancellations has not been consistently updated in government databases, the value of the usually multi-year grants has not been annualized, and many of the cancellations have been successfully challenged and blocked in court or reversed by the agency. Blanket cancellations or blocks to research grants to Columbia and Harvard universities were used by the administration as a pressure tactic to achieve policy concessions from the universities; if and when the administration reaches an agreement with the universities, most if not all the grants will likely be reinstated (even though the temporary grant stops have had real effects). To calculate the total impact of these varied and partial and unstable interventions would require a painstaking analysis; in its absence, it seems reasonable to estimate the overall cuts to NIH funding in FY2025 at less than 5% of the approved budget.

There is another mechanism in play that has reduced the amount of available funding. NIH has been approving *new* grants at a slower pace than it did last year (despite working with the same budget), and the renewals of multi-year grants for another year have been delayed in many cases. According to some reports, $6 billion less has been awarded in 2025 to new and renewed grants as of July compared to the last year.[17] The administration explains the delays as a result of a more stringent review process; staff cuts at NIH must have played a role as well. It is unclear whether this should be regarded as a real "cut," but it has real effects. It adds another 12% to NIH funding arrears for 2025.

But the president's budget proposal for FY2026 speaks with a much clearer language: 41% reduction in NIH R&D funding compared to FY2025, a massive cut far exceeding the cuts realized this year. Yet that 41% figure is clear only on paper so far. The budget for 2026 has not

outlays. For FY2024, $23.2 billion was requested for HSS-funded basic research, $27.2 billion for HSS-funded applied research.

[17] https://jeremymberg.github.io/jeremyberg.github.io/?fbclid=IwY2xjawKYSmpleHRuA2FlbQIxMABicmlkETFoUTZ1YTlaUW5pdGY1bXZsAR7Jr52cNG1JplvCHi7insTjHcmN_W3Du6t5vX9Dawx2ZFy-JklBJ7YFdaFkUw_aem_EzWRNEzMs4BIlgAwhrGpXg , accessed 8/4/2025

been approved, and the structure of whatever cuts it ends up mandating—and of whatever cuts will actually be implemented—is still unknown.

Note that all these arguments are also relevant to calculating funding cuts at the other governmental agencies.

NIH indirect cost reduction

Cutting the government's funding of "indirect costs" did not generate a lot of news stories that would grab public attention, but it was—at least potentially—the most severe of the NIH funding cuts implemented in 2025, affecting every single grant. The roots of this policy change can be found in Project 2025, a comprehensive policy document prepared by the conservative think tank Heritage Foundation in preparation for Donald Trump's second presidency. President Trump has not officially embraced Project 2025, but it seems clear that it inspires many of his administration's policies. Russell Vought, President Trump's current director of the Office of Management and Budget (OMB), was one of Project 2025 co-authors.[18]

Project 2025 identified the indirect costs (the costs not specific to a particular research project, like rents, utilities, administration, or maintenance of laboratory animals) charged by institutions such as universities to government grant awards as a target ripe for funding cuts. The document characterized the indirect cost rate charged by universities as excessive, with the excess funds diverted by universities to pay for expenses unrelated to research: a clear form of waste, fraud, and abuse. The Trump administration took aim at the NIH funding of indirect costs soon after it came into power. In a 2/7/25 post on X, the president's then-advisor Elon Musk, charged with fast-tracking the government spending reform, complained: "Can you believe that universities with tens of billions in endowments were siphoning off 60% of research award money for "overhead"? What a ripoff!" The same day, the NIH officially announced that the maximum rate for indirect costs would now be set at 15%, and that the NIH would no longer cover indirect costs exceeding that rate, even in already approved grants. According to the NIH directive, indirect costs paid from NIH grants comprised 26% of the total costs in 2023, and 27-28% of total costs for FYs 2009-2021, although actual amounts varied greatly from one project and institution to another. [19] The announcement explained that NIH's duty is "to ensure that as many funds as possible go towards direct scientific research costs rather than administrative overhead." There was, however, no indication that NIH would reallocate the indirect cost savings toward more research. The new policy became effective on 2/10.

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[18] Link to the Project 2025 document: https://static.heritage.org/project2025/2025_MandateForLeadership_FULL.pdf . The proposal to cap indirect research costs charged by universities can be found on page 355.

[19] Cited in the statement issued by the NIH Office on 2/7/25, "Supplemental Guidance to the 2024 NIH Grants Policy Statement: Indirect Cost Rates." Notice NOT-OD-25-068, https://grants.nih.gov/grants/guide/notice-files/NOT-OD-25-068.html (accessed 3/26/25). The statement gives the figures for 2023 in the following passage: "NIH's mission is to "seek fundamental knowledge about the nature and behavior of living systems" in order to enhance health, lengthen life, and reduce illness and disability. In furtherance of this mission, NIH spent more than $35 Billion in Fiscal Year 2023 on almost 50,000 competitive grants to more than 300,000 researchers at more than 2,500 universities, medical schools, and other research institutions across all 50 states and the District of Columbia. Of this funding, approximately $26 billion went to direct costs for research, while $9 billion was allocated to overhead through NIH's indirect cost rate."

However, the announcement also created confusion. The NIH notice conveyed the impression that the government wished to reduce the indirect costs from 26-28% of *total* grant costs on average to 15% at most. But that outcome would not be achieved by setting the "indirect cost rate" at 15%, because indirect costs are customarily not calculated as the proportion of *total* costs but as the proportion of *adjusted direct* costs, a much smaller starting figure. At Princeton University, to take one example, setting the indirect cost rate at 15% would in fact reduce the share of indirect costs in grants to 8% of total grant money (from the current 27% at that university).[20] In other words, the policy directive seemed to go far beyond its stated goals. The overall savings that would be realized by indirect cost capping were presented by Musk as $4 billion a year, about 8% of NIH's discretionary budget ($48.6 billion for FY2024, see above).

The directive was vehemently protested by the university research community, which argued that the indirect expenses charged to grants were real costs of research and could not be easily assumed by the universities themselves.[21] The reduced grants would not be able to support research as planned, and universities would also be forced to economize elsewhere (in their non-science departments, for example) even to keep their research facilities running. Universities challenged the indirect cost capping directive in federal courts, and on April 4, 2025, a federal judge blocked the directive, arguing that it the administration did not follow proper procedures in instituting it. The directive was therefore in force for just two months.[22]

The administration has made it clear, however, that it intends to incorporate the 15% capping policy for all federally funded research (not just at NIH but at other agencies as well) in the 2026 R&D budget. The administration's plan has had a powerful ripple effect on universities across the United States: university after university has started announcing budget cuts and reductions in staff, citing the loss of funds through indirect cost capping as one of the important contributing factors. Yet there has also been another initiative, an attempt at finding a compromise: a group of universities has proposed an alternative policy of calculating indirect costs that would provide more guarantees that the money charged to indirect costs is used for research activities.[23]

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[20] Liz Fuller-Wright, "The partnership that drives America's leadership in medical discovery: How it works and what's at stake," *Office of Communications, Princeton University,* Feb. 18, 2025, https://www.princeton.edu/news/2025/02/18/partnership-drives-americas-leadership-medical-discovery-how-it-works-and-whats?utm_campaign=communications&utm_content=1740000314&utm_medium=social&utm_source=linkedin , accessed 8/4/2025. The calculations are mine, based on the figures in the source. NIH's own guidance issued later acknowledged that the 15% maximum rate was to be calculated as a share of adjusted direct costs: "NIH Indirect Costs Policy for Research Grants: Recent Developments," 3/3/2025, https://www.congress.gov/crs-product/IN12516 , accessed 8/19/2025.

[21] Christina Jewett and Sheryl Gay Stolberg, "Trump Administration Cuts Put Medical Progress at Risk, Researchers Say," *NYT*, 2/7/2025, https://www.nytimes.com/2025/02/07/us/politics/medical-research-funding-cuts-university-budgets.html , accessed 8/4/2025.

[22] "Tracking the Trump administration's moves to cap indirect research funding," June 24, 2025, *Higher Ed Dive*, https://www.highereddive.com/news/tracking-the-trump-administrations-moves-to-cap-indirect-research-funding/751123/ , accessed 7/11/2025.

[23] "The Financial Accountability in Research (FAIR) Model," *Association of American Universities*, July 11, 2025, https://www.aau.edu/key-issues/financial-accountability-research-fair-model , acc 8/4/25; Clare Zhang, "Higher Ed Groups Bring Indirect Cost Proposal to White House," July 17, 2025, *The American Institute of Physics*, https://www.aip.org/fyi/higher-ed-groups-bring-indirect-cost-proposal-to-white-house , accessed 8/4/25

Direct terminations of NIH grants

The administration has terminated many existing NIH grants directly, in their entirety. The picture is somewhat complex: while some terminated grants have been targeted based on their topic, others have been terminated only because the researchers worked at Columbia and Harvard universities against which the administration has taken a blanket punitive action. It's best to separate the grants targeted by topic from those that were targeted by institution.

Information on grants terminated by NIH and NSF is being collected by the independent Grant Witness project.[24] Grant Witness has drawn on the government's own databases and on self-reporting by the affected researchers. Grant Witness's database and reports are a tremendous resource; still, the format of the information makes it difficult to gauge the overall size of the cuts.

We can easily get the information on the *number* of terminated projects. According to the Grant Witness's NIH report of 7/30/25, the number of NIH grants that had been terminated until then was 3,028. Subtracting a fairly large number that were later reinstated, the number of grants that had remained terminated was 1,942. There were 76,656 active NIH grants in total as of July 30. That would make the share of all grants that had been terminated about 4% of the total by number, and of those that had remained terminated 2.5% of the total.[25] Among the terminated/not reinstated grants, there were 773 grants associated with Harvard or Columbia, 40% of all such grants.[26] Without the grants affiliated with Harvard or Columbia, the terminated/not reinstated grants represented about 1.5% of all NIH grants. 1.5% or 2.5% do not sound like drastically large numbers.

However, grants vary greatly in size. There are grants worth tens of thousands of dollars, and others worth tens of millions. It would be useful to know the combined *value* of the grant terminations. The problem is that estimating the value of the terminated grants as a share of NIH's annual budget is difficult. In the Grant Witness NIH database, the "total value" of the terminated and not reinstated grants was listed as $4.5 billion as of August 4, and media reports have often used that type of figure to capture how severe these cuts have been. However, the "total" values provided by Grant Witness are *not annual*; they are the sum of all the funds approved for a project during its lifetime, which often extends over many years (a common duration of an NIH grant is 5 years, but some important and large grants are active for decades).

The administration's priorities

In years past, only a handful of grants were terminated by NIH each year, usually for serious breaches such as misconduct. The administration moving to terminate thousands of grants is without precedent. How did the administration decide which grants ended up on the chopping block? What reasons has it given? Most of its termination letters say that the grant "no longer effectuates the agency's priorities." When additional explanations are given, they often stay quite general; many researchers, after comparing notes, have discovered they received identical letters. This has been criticized, understandably, as high-handed. The process that NIH uses to single out

[24] https://grant-witness.us/ (the project was originally called Grant Watch)
[25] 3028/(1942+ 76656) = 3028/78598; and 1943/78598
[26] https://grant-witness.us/ accessed 8/4/25; 153 Columbia, 620 Harvard.

projects for termination has also remained opaque; there are reports that it often did not go beyond mechanically scanning project abstracts for certain keywords that have been called "triggering," keywords that represent priorities and research directions that the administration disapproves of; and that grants were reviewed for only minutes before being terminated.[27]

The administration defends its "no-fuss" termination practice as dictated by urgency and efficiency. It may not explain its priorities fully in the termination letters, but it has articulated them on numerous occasions. Many of those priorities depart radically from the past and in the administration's view demand urgent action. The priorities that seem to account for most NIH terminations include: categorical rejection of "DEI"; categorical rejection of "gender ideology"; a reduction of support for projects benefiting countries outside the US; and a reduction of support for research related to infectious disease (notably, though not only, COVID) and vaccines. Rejection of "DEI" and "gender ideology" and cutting back on foreign aid represent priorities of Trump's administration as a whole; the reduction of support for research on infections and vaccines is specific to HHS's current leadership, particularly Secretary Robert F. Kennedy Jr.

President Trump's administration wholesale rejection of "illegal DEI" (diversity, equity, and inclusion) and "gender ideology" is outlined in three presidential executive orders issued on January 20 and 21.[28] In two "DEI" executive orders, Trump expressed his administration's strong disapproval of government policies that specifically support populations defined by race, ethnicity, gender, sexual orientation, sex, or religion. There is a very important historical context here. Trump's orders expressly revoke policies that date back to 1965 and the administration of Lyndon Johnson. Johnson's policies (executive order 11246 and related regulations), in force for 60 years, supported the implementation of the Civil Rights Act of 1964 which ended legal racial segregation and discrimination in the United States.[29] Johnson's policies were based on the view that active government support is necessary to prevent or reduce discrimination against members of certain groups. The support has been typically framed as assistance necessary for overcoming "disparities" (unequal outcomes) between the group in question and a reference population (typically non-minority), thus achieving "equity," i.e., a just distribution of outcomes. The

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[27] Only minutes: Bysara Reardon, "Judge orders NIH to restore hundreds of grants cut under Trump," June 16, 2025, *Science*. https://www.science.org/content/article/judge-orders-nih-restore-hundreds-grants-cut-under-trump , accessed 7/11/25. Triggering keywords: Karen Yourish, Annie Daniel, Saurabh Datar, Isaac White and Lazaro Gamio, "These Words Are Disappearing in the New Trump Administration," *NYT*, March 7, 2025. https://www.nytimes.com/interactive/2025/03/07/us/trump-federal-agencies-websites-words-dei.html?unlocked_article_code=1.2E4.53XY.1m0NVQ_fg5Ls&smid=url-share , accessed 8/4/2025; Bruce Y. Lee, "These 197 Terms May Trigger Reviews Of Your NIH, NSF Grant Proposals," *Forbes*, March 16. 2025. https://www.forbes.com/sites/brucelee/2025/03/15/these-197-terms-may-trigger-reviews-of-your-nih-nsf-grant-proposals/ , accessed 8/4/2025.

[28] The anti-DEI orders include EO14151 https://www.whitehouse.gov/presidential-actions/2025/01/ending-radical-and-wasteful-government-dei-programs-and-preferencing/ and EO14173 https://www.whitehouse.gov/presidential-actions/2025/01/ending-illegal-discrimination-and-restoring-merit-based-opportunity/; the anti-"gender ideology" order is EO14168, https://www.whitehouse.gov/presidential-actions/2025/01/defending-women-from-gender-ideology-extremism-and-restoring-biological-truth-to-the-federal-government/

[29] The original version of EO11264 can be found at https://www.eeoc.gov/history/executive-order-no-11246. The most recent text (amended) can be found at https://web.archive.org/web/20110928005709/http://www.dol.gov/ofccp/regs/statutes/eo11246.htm . Both accessed 5/22/2025. The original 1965 order did not expressly reference group membership based on sex, gender, and sex orientation. Sex was added in the amended version.

outcomes could range from hiring practices and workforce representation to educational achievements, public health outcomes, and "environmental justice." The Trump administration takes the opposite view, namely that selecting people for support based on their group membership (which it equates with the concept of DEI) is itself discriminatory and illegal, violating the Civil Rights Act. This is a conflict between two radically opposed views of "discrimination" and of the meaning of the Civil Rights Act. The legal conflict is currently headed for the U.S. Supreme Court.

President's Trump executive order aimed against "gender ideology" states that only biologically defined, immutable sex (either female or male) will be recognized by the government as the basis for group identification, and that only biological sex will distinguish men and women for legal and policy purposes. Using the "ever-shifting concept of gender" which allows for "the false claim that males can identify as and thus become women and vice versa" amounts to pernicious "gender ideology" which may not be supported by Federal funds, including grant funds.

The reduction of international assistance, indeed of any outlays or international considerations that do not directly benefit US citizens, was a broad theme of Trump's presidential campaign captured by the slogan "America First." It had contributed to his being elected. It underpins a whole host of policies the administration has undertaken, from its antiimmigration and antiimmigrant measures to diminished support for multilateral international agreements and pacts to the dismantling and defunding of USAID, the country's program of international aid established in 1961. In the context of NIH granting practices, there has been a policy change directly related to this priority: researchers can no longer "subaward" portions of their grants exceeding $30,000 to international partners without the agency's review and approval, which NIH has signaled will be difficult to get. According to a leaked internal NIH memo, "If you can't clearly justify why you are doing something overseas, as in it can't possibly be done anywhere else and it benefits the American people, then the project should be closed down."[30]

Robert F. Kennedy Jr. has long advocated dissenting views on important public health issues. Many vaccines, according to him, are both less safe and less effective than has been presented by the medical establishment. He has also long believed that the main obstacle to better public health in the United States is a regime of collusion among the pharmaceutical industry, biomedical researchers, and the state. This regime, according to RFK Jr., in essence promotes an epidemic of chronic disease which in turn props up lucrative manufacture of expensive medications. He wants to tackle what he considers as the root causes of the epidemic—environmental pollution, dangerous effects of nutrition, overmedication, and unhealthy lifestyles.[31] As the new Secretary of Health and Human Services, RFK Jr.'s has translated these beliefs into policy, and his longstanding priorities are behind President Trump's executive order on "Establishing the President's Make America Healthy Again Commission" (MAHA, echoing MAGA). The order calls for a radical refocusing of national health research toward addressing

[30] Richard L. Hudson, "Trump halts new NIH grants to international health-research partners," *The Science|Business Network,* 05 May 2025, https://sciencebusiness.net/news/clinical-trials/trump-halts-new-nih-grants-international-health-research-partners , accessed 7/16/25.
[31] Brandy Zarozny, "RFK Jr. comes 'home' to his anti-vaccine group, commits to 'a break' for U.S. infectious disease research," *NBC News*, Nov. 3, 2023, https://www.nbcnews.com/politics/politics-news/rfk-jr-comes-home-anti-vaccine-group-commits-break-us-infectious-disea-rcna123551, accessed 6/10/2025

chronic disease and mental health, whose treatment currently represents "ninety percent of the Nation's $4.5 trillion in annual healthcare expenditures…" It continues:

> To fully address the growing health crisis in America, we must re-direct our national focus, in the public and private sectors, toward understanding and drastically lowering chronic disease rates and ending childhood chronic disease. This includes fresh thinking on nutrition, physical activity, healthy lifestyles, over-reliance on medication and treatments, the effects of new technological habits, environmental impacts, and food and drug quality and safety… We must ensure our healthcare system promotes health rather than just managing disease.

Accordingly, "the National Institutes of Health and other health-related research funded by the Federal Government should prioritize gold-standard research on the root causes of why Americans are getting sick."[32] The corollaries to this program are a decrease in support for research of infectious diseases, and a reevaluation of vaccine research. In 2023—when he still harbored presidential ambitions—RFK Jr. said that if elected president, his plan was "to give infectious disease a break for about eight years."[33] Although not a president, he is now in position to pursue this funding shift. (The president's budget proposal for HSS for FY2026 restates the MAHA priorities, even as it cuts 41% of NIH's budget.)

Cuts to HIV/AIDS research and care

One research topic that leaps out as common to many terminated grants is HIV/AIDS research. There are other topics that seem to have been targeted as well, such as COVID-19, cancer, or neurogenerative diseases. But for the purposes of this report, taking a closer look at HIV/AIDS research in particular provides an informative illustration of how the administration's priorities have collided with existing research.

According to Grant Witness, the number of (at least temporarily) canceled HIV-related grants, as of 8/19/2025, was a sizeable fraction of all active HIV-related grants—about 13% (498 of about 3800), although for reasons already explained above (grants vary greatly in size), it is unclear what proportion of HIV research *by value* had been terminated. The annual value of all HIV-related NIH grants has stood in the neighborhood of $3.3 billion in recent fiscal years.[34]

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[32] "Establishing the President's Make America Healthy Commission," *The White House*, February 13, 2025, https://www.whitehouse.gov/presidential-actions/2025/02/establishing-the-presidents-make-america-healthy-again-commission/ , accessed 8/4/2025.

[33] Brandy Zarozny, "RFK Jr. comes 'home' to his anti-vaccine group," see above.

[34] $3.294 billion is the figure for HIV research for FY2023 given here: https://www.hiv.gov/blog/nih-publishes-fy-2025-hiv-aids-professional-judgment-budget#:~:text=The%20FY%202025%20NIH%20HIV,investment%20opportunities%20across%20four%20areas: , accessed 5/14/2025. FY2023 is a reasonable stand-in for FY2025, as the overall NIH funding figures for FYs 2023 and 2024 (and thus also 2025) are very similar ($49 billion and $48.6 billion, respectively)—see "Labor, Health and Human Services, and Education: FY2024 Appropriations," Congressional Research Service, updated November 4, 2024, pp. 28-33.

The letters that have accompanied many terminations signal that the main reasons for terminations have to do with "DEI" and "gender ideology."[35] Researchers usually received one of two form letters, whose key parts read as follows:

> ("The anti-DEI letter") This award no longer effectuates agency priorities. Research programs based primarily on artificial and non-scientific categories, including amorphous equity objectives, are antithetical to the scientific inquiry, do nothing to expand our knowledge of living systems, provide low returns on investment, and ultimately do not enhance health, lengthen life, or reduce illness. Worse, so-called diversity, equity, and inclusion ("DEI") studies are often used to support unlawful discrimination on the basis of race and other protected characteristics, which harms the health of Americans. Therefore, it is the policy of NIH not to prioritize such research programs.[36]
>
> ("The anti-gender letter") This award no longer effectuates agency priorities. Research programs based on gender identity are often unscientific, have little identifiable return on investment, and do nothing to enhance the health of many Americans. Many such studies ignore, rather than seriously examine, biological realities. It is the policy of NIH not to prioritize these research programs.[37]

How have the administration's "anti-DEI" and "anti-gender" priorities come to clash with the HIV/AIDS research? The roots of the clash seem to be in HIV/AIDS epidemiology and the current phase of the HIV/AIDS research.

Broadly speaking, the HIV/AIDS research today focuses not only on finding new medications and prophylactics (notably an HIV vaccine and an HIV cure, neither yet available), but also on managing the spread of HIV through already existing prophylactics and medications. With appropriate prophylactics—condoms and, newly, PrEPs, or pre-exposure prophylactic drugs—the spread of HIV can be curtailed. With appropriate medications (such as antiretroviral drugs), the course of HIV infection in patients can be managed, the virus can be suppressed inside the body, and the risk of transmission can be minimized. Appropriate HIV testing and awareness of one's HIV status is another crucial part of the equation. It follows that the main current strategies for subduing the HIV/AIDS epidemic in the U.S. include spreading awareness, encouraging prevention and precaution, and enhancing access.

There is an interesting backstory. In 2019, during his first administration, Donald Trump announced a plan to "eliminate the HIV epidemic in the United States" by 2030. At the time, his administration thought it reasonable to distribute resources for HIV/AIDS research and care according to known geographic disparities, with most funds directed to southern states of the US

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[35] The fact that HIV is an infectious disease seems a less prominent reason for termination. In fact, HIV/AIDS is both infectious and chronic, so it is unclear exactly how or whether the declared shift in health research priorities from infectious to chronic diseases matters here.

[36] The verbatim text of this termination letter is referenced in Cheryl Clark, "Trump's War Against HIV Research and Care," *Med Page Today*, March 31, 2025, https://www.medpagetoday.com/infectiousdisease/hivaids/114895 , accessed 5/13/25.

[37] Mary Kekatos, "NIH terminating active research grants related to LGBTQ+, DEI studies," March 7, 2025, *ABC News*, https://abcnews.go.com/Health/nih-terminating-active-research-grants-related-lgbtq-dei/story?id=119553232 , accessed 6/10/25.

with increased prevalences of HIV and AIDS especially among their Black populations.[38] The strategy bore fruit—according to one source, new infections declined by 21% in the Southern United States from 2017 to 2022, and nationwide by 12% from an estimated 36,200 in 2018 to an estimated 31,800 in 2022.[39]

That said, the epidemic has not been contained yet. As of 2022, there were an estimated 1.2 million people living with HIV in the United States, with more than 30,000 new infections every year. It was estimated that there were about 160,000 people with undiagnosed HIV. Most of the newly infected people, 67%, were "men who have sex with men," or MSMs, a term encompassing both gay and bisexual men. 19% of new infections were among women (by birth). A significant number of newly diagnosed HIV cases were transgender women (2% of the total). A majority of the new infections were among people who belonged to racial or ethnic minorities (37% Black, 33% Hispanic); and 20% of the new infections were among young people (13-24 years of age).[40] Intravenal drug use is a known vector of the viral transmission, but extravenal use has also been correlated with a higher risk of spreading HIV as it may cause riskier sexual behavior.

The epidemiological picture itself thus throws up a number of "disparities." Reflecting this epidemiological reality, much of the research has been aimed at improving access and awareness among the at-risk groups: gay and bisexual men, racial and ethnic minorities, drug users, young people, transgender people. Researchers work hard to make sure that anyone who might be at risk—more often than not a member of a minority group—gets tested, uses prophylactics, and gets treatment if they are infected. In the words of Philip Chan, a professor at Brown University, who lost funding for projects concerned with administering PrEPs to male sex workers and African American msms: "When we talk about maximizing resources and impact, you want to focus on the populations that are affected most. This is based on data and science. This is not promoting DEI."[41]

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[38] President Trump's Address Before a Joint Session of the Congress on the State of the Union, February 5, 2019, transcript, https://www.govinfo.gov/content/pkg/DCPD-201900063/html/DCPD-201900063.htm , accessed 8/4/2025; "Trump administration launches campaign to end HIV-AIDS in the U.S. by 2030," *PBS News*, February 6, 2019, https://www.pbs.org/newshour/health/trump-administration-launches-campaign-to-end-hiv-aids-in-the-u-s-by-2030 , accessed 8/4/2025.

[39] Most figures concerning "new cases" in the paragraph represent (estimated) new *infections* (diagnosed or not); the figure concerning transgender women refers to new HIV *diagnoses* (with an undetermined time of infection). Sources: CDC's HIV Surveillance Report, vol. 29, no. 1, "Estimated HIV Incidence and Prevalence in the United States, 2018–2022," https://stacks.cdc.gov/view/cdc/156513 , accessed 6/11/2025. Vol. 29, no. 2, "Monitoring Selected National HIV Prevention and Care Objectives by Using HIV Surveillance Data. United States and 6 Territories and Freely Associated States, 2022," https://stacks.cdc.gov/view/cdc/156511 , accessed 6/11/2025, gives the figure of 36,470 new HIV diagnoses (as distinct from new infections) for 2022. New diagnoses did not decline between 2018 and 2022: 37,100→37,600.

[40] See the sources above. There are some minor disparities between the numbers representing new infections on one hand (estimates that include both diagnosed and undiagnosed cases) and new diagnoses on the other (those can be counted directly). See also "The HIV/AIDS Epidemic in the United States: The Basics" by *KFF*, updated 10/9/2024, https://www.kff.org/hivaids/fact-sheet/the-hiv-aids-epidemic-in-the-united-states-the-basics/#:~:text=Still%2C%20in%202022%2C%20nearly%205%2C000,sex%20with%20men%20(67%25) , accessed 6/11/2025.

[41] Fenit Nirappil, "Deep cuts to HIV research could halt decades of progress, scientists say," April 4, Washington Post, https://www.washingtonpost.com/health/2025/04/04/hiv-trump-cuts-prep/ , accessed 5/13/2025; Dr. Chan's

Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN)

One of the highest-profile grant cancelations concerned the Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN), a project that has been running since 2001. The most recently approved phase of the project was budgeted for about 7 years (January 2023-November 2029) and was led jointly by Florida State University and the private research services company Westat.[42] Over roughly the last 3 years, the approved budget has added up to $60.6 million ($36 million to Florida State, $24.6 million to Westat). On March 21, 2025, the project leads received a letter from the HSS/NIH that its grant was being terminated more than 5 years ahead of its scheduled completion in 2029.[43] (Extrapolating from the money that had been approved for its first 3 years, about 20 million a year, it would receive an additional $80 million through 2029.) HSS's letter to the principal investigators was the "anti-DEI" kind ("Research programs based primarily on artificial and non-scientific categories, including amorphous equity objectives, are antithetical to the scientific inquiry," etc.). Evidently the administration took issue with the "DEI" dimensions of the ATN project.

Nothing will illustrate better what the conflict concerning "effectuating priorities" is about than taking a closer look at how the researchers themselves have described this project in their proposals, while simultaneously holding the administration's categorical opposition to "DEI" and "gender ideology" in mind.

ATN's purpose is described in its overall grant abstract. It is simple and convincing epidemiologically: people under the age of 25 are least likely to know their HIV status, least likely to take prophylactics (PrEP) when needed, and least likely to take medication when HIV positive. In short, young people are where interventions are sorely needed; ATN investigated the most effective ways in which such interventions might happen. [44]

ATN had a broad mandate to explore and identify a variety of new approaches for intervention, but 6 concrete subprojects were already specified in the grant: expanding HIV screening, identifying the preferred prophylactic for msms, combining HIV prophylactics and contraception for young women, reducing drug use that might drive risky sexual behaviors, and a complex intervention strategy aimed specifically at "transgender and gender diverse (TGD)… youth of color." At least two of the subprojects—the one aimed at transgender youth (LEAP) and the one

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projects can be found via NIH RePORTER, https://reporter.nih.gov/search/nedlHYSuj0G8H8Sb6-EROQ/projects?fy=2025;2024&sort_field=name&sort_order=asc , accessed 7/29/2025.

[42] Although one of its two principal investigators, Dr. Hosek, is at the University of Illinois. The grant numbers are UM2HD111102-03 (FSU) and UM2HD111076-03 (Westat). The most recent Westat grant ran from September 2022.

[43] The obligations for the current budget year were $11.6 million for FSU and $7.6 million for Westat, according to NIH RePORTER, accessed May 21, 2025. Usaspending.gov (accessed May 21, 2025), provides information on the total project funds to date that have been "obligated" and those that have been "outlayed." The obligated funds, at least in this case, indicate only the amount up to the current budget period, but not beyond it (i.e., not until 2029). The obligated funds exceed the outlayed ones, indicating that while the money has been approved for this budget year, a significant part of it has not yet been used by the researchers. This being a long-term project, its funding might well have been extended past 2029.

[44] "Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN) Scientific Leadership Center," Project Number 5UM2HD111102-03, Abstract, https://reporter.nih.gov/project-details/10993597, accessed 5/21/2025.

aimed at young women (MPT Study)—were described in terms that likely flagged them as objectionable for the administration.

RP (Research Project) 4 "LEAP" (funded at 8% of the total FSU grant) was described in the grant proposal abstract as follows:

> The HIV prevention and care continua emphasize the need to reduce HIV transmission risk via regular HIV testing, consistent condom use, and linkages to HIV prevention and care, such as pre-exposure prophylaxis (PrEP) among HIV- negative individuals and antiretroviral therapy (ART) and viral suppression among people living with HIV. However, there are inequities at each step of these continua among TGD youth of color. TGD youth of color experience intersectional oppression that results in unmet gender affirmation, legal, and economic needs, which have been linked to inequities in HIV prevention and continua outcomes. Building on formative work, this project seeks to test the effectiveness of the LEAP intervention, a HIV status-neutral intervention designed to address social determinants of health to reduce sexual risk behaviors, increase HIV prevention uptake (PrEP use), and treatment outcomes (viral suppression). LEAP will harness the resources, geographic diversity, and multidisciplinary expertise of the Adolescent Trials Network for HIV/AIDS Interventions (ATN) to provide gender-affirming individualized HIV prevention and treatment peer support, address health-harming legal needs, and improve educational and employment outcomes for translation into real-world practice.[45]

"Inequities", "intersectional oppression", "unmet gender affirmation"; the administration's grant reviewers likely took issue with each of these concepts.

RP5 "MTP Study" (3% of the total) aimed to combine contraceptives and HIV prophylactics in Multipurpose Prevention Technology Products (MTP). It presented "pregnancy prevention" as one of its desirable health outcomes, which may have provoked ideological resistance from the conservative "pro-life" administration; similarly, describing the goal as providing MTP to "adolescents assigned female at birth… across genders" would also have been flagged.[46]

The NIH reviewers may also have been displeased with some of the publications that came out of the project. For example, the ATN grant supported a 2024 research study (Borre *et al.*) which critiqued an approach to HIV prevention adopted by conservative state authorities in Tennessee.[47] In 2023, Tennessee replaced about $6 million in federal funds for HIV prevention with state funding while shifting prevention priorities from CDC-indicated priority groups (groups identified as high risk by the federal Centers for Disease Control) such as MSM, transgender women, heterosexual Black women, and intravenous drug users to new priority groups: first responders, pregnant women, and victims of sex trafficking.[48] The Borre study

[45] 5UM2HD111102-03, subproject 6975, accessed 5/21/2025. LEAP stands for Listen-Empathize-Agree-Partner.
[46] 5UM2HD111102-03, subproject 6976, accessed 5/21/2025. The MTP in question would combine the HIV prophylactic cabotegravir (CAB) with the contraceptive levonorgestrel (LNG).
[47] Borre, Ethan D *et al.*, "Projecting the Potential Clinical and Economic Impact of HIV Prevention Resource Reallocation in Tennessee," *Clinical Infectious Diseases* 2024;79(6):1458–67.
[48] The article uses the term "pregnant people" rather than "pregnant women," but I doubt the former was used by the Tennessee officials behind the policy. The article authors probably followed the HSS or AMA guidelines at the time.

concluded that this reallocation of funds from the CDC-defined groups to the Tennessee-defined ones would result in increases in HIV transmissions, deaths, and costs; it pointed out, for example, that both HIV incidence and risks of HIV transmission among first responders are much lower than among the CDC groups (estimating, for example, 1672 HIV-positive transgender women in Tennessee, most undiagnosed, compared to 83 HIV-positive first responders, most diagnosed) or that the incidence of undiagnosed HIV among pregnant women is extremely low (1 a year in Tennessee). Essentially, the Borre study implied that the Tennessee approach was ineffective because it was driven by ideological views of who should be prioritized for receiving public health services (public servants facing dangers to protect the public, crime victims, mothers) and who should not (drug users, transgender people, the promiscuous). Whether or not the study by Borre *et al.* played a role in the ATN grant cancelation, it provides another vivid illustration of the underlying ideological clash between "equity" as understood by the administration and "equity" as understood by many in the HIV research community.

Yet, in a twist, the ATN grant did not remain canceled. Its stakeholders joined a legal challenge against NIH, and on June 16, 2025, a federal judge in Massachusetts blocked the 800 grant cancelations joined in the case, including ATN, and ordered NIH to restore the awards, arguing that the cancelations were arbitrary and that NIH failed to prove that the canceled projects supported unlawful discrimination (as the NIH argued in the termination letters). In fact, the judge called the cancelations themselves discriminatory, declaring "I've sat on this bench now for 40 years and I've never seen government racial discrimination like this." The administration has appealed the judge's ruling to the Supreme Court on July 24, 2025.[49]

Other HIV/AIDS cuts

Many other HIV/AIDS grants have been targeted for termination. Centers for AIDS Research (CFARs) are a country-wide network of mostly university-affiliated centers coordinating AIDS research. Two of the 20 CFARs saw their grants terminated in March 2025: the CFAR at Emory University in Atlanta, and another at Northwestern University (called Third Coast CFAR). Most CFARs described their research projects in terms that included categories associated with diversity, equity, and inclusion. It is unclear what drew the grant-cutters to the specific two CFARs that have been terminated. Redundancy would not seem like a good reason to cut these centers: each was the only CFAR serving a major metropolitan center, Atlanta and Chicago, respectively.

Perhaps what mattered was how prominently the DEI terms were incorporated into the description of the centers' missions and priorities. The proposal abstract from Emory CFAR states, for example:

> Given the high burden of HIV in our geographical region, coupled with clear inequities in access to healthcare in the communities we serve, the Emory CFAR is committed to

[49] Bysara Reardon, "Judge orders NIH to restore hundreds of grants cut under Trump," June 16, 2025, *Science*. https://www.science.org/content/article/judge-orders-nih-restore-hundreds-grants-cut-under-trump , accessed 7/11/25; Abbie VanSickle, "Trump Administration Asks Supreme Court to Allow N.I.H. to Cut D.E.I.-Related Grants," July 24, 2025, *NYT*. https://www.nytimes.com/2025/07/24/us/politics/trump-supreme-court-nih-dei-grants.html , accessed 7/25/25.

> working toward equity in all aspects of research, faculty development, and community engagement.

And the one from the Third Coast:

> TC CFAR recognizes it is also important to creating [sic] career pathways for Underrepresented Minorities (URM) in the behavioral, health services, social, and/or translational sciences in order for them to develop successful and impactful careers in research on minority health and health disparities specifically focused on HIV.

In other CFAR project summaries, such references are perhaps less prominent there than they are with Emory and the Third Coast. The Harvard CFAR abstract mentions the following as the third of its four priorities: "Promote Diversity, Equity and Inclusion (DEI) throughout all aspects of the CFAR and expand Community Engaged Research." The abstract submitted by San Diego CFAR contains no references to equity or disparities. But it is hard to be certain; some CFARs, like the one at the University of Washington, have kept their funding while using DEI language as prominently as the two CFARS that have lost it. But just as with other grants, there has been a development: as of August 2025, it seems that the Emory and the Third Coast CFAR grants may have been reinstated, while the grants for the Harvard CFAR and the Texas CFAR at Baylor University may have been terminated in the meantime.[50]

The Wits HIV Research Group Clinical Trial Unit (CTU), based at the University of the Witwatersrand, Johannesburg, South Africa, has lost its funding as well. The Unit focused on trialing drugs and methods of HIV treatment and prevention, and it received $1.86 million from NIH in 2024. [51] The loss of funding at the Wits would be consistent with the administration's America First stance. However, other HIV-related projects whose research subjects—and beneficiaries—live abroad have stayed in place: The East Africa Consortium for HPV and Cervical Cancer in Women living with HIV/AIDS, Einstein/Rwanda/DRC Consortium for Research in HIV/HPV/Malignancies, and other large programs for trialing preventative and therapeutic measures who conduct trials in Africa such as HIV Vaccines Clinical Trials Network, and AIDS Malignancy Consortium.

Disruptions to other (non-research) HIV-related US support have made an impact in South Africa and elsewhere, prominently the disruptions to PEPFAR, or the President's Emergency Plan for AIDS Relief established during George W. Bush's administration in 2003. PEPFAR's annual budget is nearly $5 billion, but its funds were initially frozen, together with other "foreign aid," by the incoming Trump administration in January 2025, and then permitted to go out but on a more limited basis, supporting HIV testing and treatment but not HIV prophylaxis or prevention, except in pregnant and breastfeeding women. The staff administering PEPFAR services abroad, which had been funded through USAID and CDC, lost that funding as well, and

[50] Per Grant Witness, August 5, 2025.

[51] https://reporter.nih.gov/search/183MvPM3BEqMhvyuF67PgA/project-details/10745718 (accessed 6/12/2025). The loss to Wits is compounded by the fact that it has also relied on funding through USAID which has also been withdrawn. Aisling de Lange, "Wits scrambles to lessen fallout from Trump's funding cuts," *GroundUp*, May 21, 2025, https://groundup.org.za/article/wits-scrambles-to-lessen-fall-out-from-trumps-funding-cuts/ , accessed 5/23/25.

staff layoffs followed. Many PEPFAR's services were disrupted and diminished, and the future of the program—which has been credited with saving 28 million lives to date—is unclear.[52]

In the first few months after the administration took over, it seemed that HIV-related grant terminations were limited to the research projects that put concerns with "equity" front and center, or those that could be construed as primarily benefiting foreigners rather than U.S. citizens. But more recently the administration started terminating large HIV vaccine development and trial projects as well. On May 30, the Consortium for HIV/AIDS Vaccine Development (CHAVD), run by Duke University and the Scripps Institute, received a letter that its grant was being terminated. CHAVD has been operational since 2005 and has been approved for $350 million in obligated grants over its lifetime ($258 million for its latest 7-year award). Its yearly funding stood at about $42 million—an award at the high financial end of the award spectrum. In connection with this grant termination, the administration has signaled that it is cutting "duplicative" HIV grants, a plainly cost-cutting measure, implying that too much research effort and funding is being invested into HIV research. ("Duplicative" cannot be taken in the literal sense of different teams duplicating each other's work but rather different teams working toward the same goal, a working vaccine.)

The financing for another large vaccine project, trials for a prospective mRNA HIV vaccine developed by Moderna, is being paused, apparently as part of the same effort to prune "duplicative efforts." It is a reasonable bet that RFK Jr.'s longstanding criticism of mRNA vaccines is also playing a role in this particular case, as might his general vaccine skepticism more broadly.

In one statement cited in the press, some administration officials said that the current approaches to countering HIV are sufficient, implying that research into additional anti-HIV tools (vaccines, cures, prophylactics) is unnecessary. But there are reports of internal dissent and perhaps debate at the NIH: an unnamed NIH official is reported as saying that a vaccine remains "the only way of ending the HIV epidemic."[53]

Other funding lost at NIH or HSS

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[52] "The Trump Administration's Foreign Aid Review: Status of PEPFAR" by *KFF*, published May 5, 2025, accessed 5/14/25, https://www.kff.org/global-health-policy/fact-sheet/the-trump-administrations-foreign-aid-review-status-of-pepfar/#:~:text=PEPFAR%20has%20been%20reauthorized%20by,long%20as%20Congress%20appropriates%20funding. The latest reporting indicates PEPFAR's mission may radically change away from providing AIDS relief in Africa and elswehere: Stephanie Nolen, "U.S. Quietly Drafts Plan to End Program That Saved Millions From AIDS," NY Times, July 23, 2025, https://www.nytimes.com/2025/07/23/health/pepfar-shutdown.html , accessed 8/5/2025.

[53] Dr. Céline Gounder, "Trump administration ending multiple HIV vaccine studies," *CBS News,* 5/30/2025, https://www.msn.com/en-us/news/us/trump-administration-ending-funding-for-hiv-vaccine-research/ar-AA1FOous?ocid=BingNewsVerp , accessed 6/12/25; Apoorva Mandavilli, "Trump Administration Ends Program Critical to Search for an H.I.V. Vaccine," *NY Times*, 5/30/2025, https://www.nytimes.com/2025/05/30/health/trump-hiv-cuts.html , accessed 6/9/25. Details about the CHAVD awards can be found on the government's databases NIH RePORTER and USA spending: The Scripps part of CHAVD, award ID 5UM1AI144462-06, https://reporter.nih.gov/search/ZTeT37nRVkezbTMiJkxAGQ/project-details/10894260 ; https://www.usaspending.gov/award/ASST_NON_UM1AI144462_7529 . The Duke part of CHAVD, award ID 5UM1AI144371-06 https://reporter.nih.gov/search/ZTeT37nRVkezbTMiJkxAGQ/project-details/10877768n ; https://www.usaspending.gov/award/ASST_NON_UM1AI144371_7529

On August 5 2025, HSS announced a cancellation of $500 million worth of financial support for the development of mRNA vaccines that was to be delivered through the Biomedical Advanced Research and Development Authority (BARDA), an HSS division separate from the NIH. RFK Jr. himself explained that "BARDA is terminating 22 mRNA vaccine development investments because the data show these vaccines fail to protect effectively against upper respiratory infections like COVID and flu." It would be difficult to find a better illustration of how far RFK Jr.'s views are removed from the majority expert opinion, which credits mRNA vaccines with saving millions of lives during the covid pandemic.[54]

Many other grants that have been terminated by NIH are training grants rather than research grants. Training grants support students and researchers at the start of their careers, and they are essential to those individuals personally as well as to the research projects they work on. Without the training grants, principal investigators would be unable to include them in their research teams.

Training grants are often structured as support for people believed to face extra obstacles in pursuing research careers on account of social prejudice or limited resources. Groups thought to need this support are often those that are underrepresented in the ranks of researchers: women, ethnic and racial minorities, and people from low-income families. This practice has clashed with the administration's "anti-DEI" stance. Newspapers have reported in detail, for example, on the impact of training grant terminations on multiple recipients of "Ruth L. Kirschstein National Research Service Award (NRSA) Individual Predoctoral Fellowship to Promote Diversity in Health-Related Research"; the terminations affected research at top research universities such as The Johns Hopkins or Princeton, and withdrew support from non-minority students with documented economic disadvantages—a demographic that the administration usually champions. The Pediatric Scientist Development Program at Cornell University, which received $1.65 million in 2023 and $1.5 million in the most recent funding year, is another project that has had its grant terminated. Its abstract laments the "ongoing limited diversity of pediatrician scientist leaders" and proposes to sustain its "diversity recruitment pipeline" while maintaining "a goal of ≥25% of applicants and >50% scholars from underrepresented in medicine (URiM) backgrounds in this grant cycle." Similarly, a number of "RISE" awards (Research Training Initiative for Student Enhancement) supporting undergraduate and graduate research have been terminated, presumably since their stated goal is often to support students from "underrepresented groups."[55]

Another potential loss of training funds for young biomedical researchers may be caused by the projected cuts to Medicaid, a non-discretionary government program of medical assistance, unrelated to NIH's discretionary budget. Significant cuts to Medicaid spending were part of the "One Big Beautiful Bill," which reset the government's non-discretionary spending and revenue

[54] "HHS Winds Down mRNA Vaccine Development Under BARDA," *U.S. Department of Health and Human Services*, August 5, 2025, https://www.hhs.gov/press-room/hhs-winds-down-mrna-development-under-barda.html , accessed 8/19/2025; Rob Stein, "Public health experts dismayed by RFK Jr.'s defunding of mRNA vaccine research," *NPR*, August 6, 2025, https://www.npr.org/sections/shots-health-news/2025/08/06/nx-s1-5493544/rfk-defunding-mrna-vaccine-research , accessed 8/19/2025; Darren Incorvaia, "HHS winds down mRNA vaccine development funded by BARDA," *Fierce Biotech*, Aug 5, 2025, https://www.fiercebiotech.com/biotech/hhs-cancels-all-mrna-vaccine-development-funded-barda , accessed 8/19/2025.

[55] As of 6/13/2025, I counted 79 terminated RISE grants in the Grant Watch/Grant Witness database.

and came into effect July 4, 2025. Medicaid has been a source of Graduate Medical Education funding (GME) for freshly graduated medical students, some of whom may train in research alongside clinical work.

Columbia and Harvard Universities

In March, the Trump administration paused research funding to Columbia University and in April to Harvard University, explaining it in both cases as an appropriate response to the failure of the universities to protect their Jewish students from antisemitism during the protests about the Gaza war.[56] (The administration had other complaints as well, but the accusation of antisemitism was the most prominent.) Columbia and Harvard are not the only universities the administration has targeted with a withholding of funds, but they have been affected the most by blanket grant terminations and freezes. The funds withheld are significant, and since both are leading research institutions, the research projects that have been affected are major. The NIH funds alone that were terminated or frozen come to $2.6 billion at Columbia and $2.2 billion at Harvard (those are figures totaling multiyear awards).[57]

The accusations of antisemitism and the withholding of funds have both been widely challenged. Many commentators have made the point that the administration's true priority is exercising greater control over universities rather than preventing antisemitism. Critics have pointed out that billions of dollars have been withheld from university functions that had no connection with events and incidents the administration objected to. The disputes between the administration and the universities have been litigated in court as well as negotiated outside the courts between universities' leaders and the administration. There is expectation that the withholding of the funds is temporary and that they will be released once the dispute between the universities and the administration is settled, but how long the disputes will last is unclear. On July 23, 2025, media reported that Columbia had reached an agreement with the government that results in the administration releasing the NIH funds (reversing grant terminations as well as releasing the funds for non-terminated grants) in exchange for the university contributing $200 million to the U.S. Treasury (essentially a penalty) and implementing a series of changes to its policies. The lawsuits and negotiations concerning Harvard are still ongoing, however.[58]

NIH outlook for fiscal year 2026

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[56] Grant cancellations at Columbia and Harvard: Sharon Otterman and Liam Stack, "White House Cancels $400 Million in Grants and Contracts to Columbia," *NY Times*, March 7, 2025, updated March 8, 2025, https://www.nytimes.com/2025/03/07/nyregion/trump-administration-columbia-grants-cancelled-antisemitism.html , accessed 8/19/2025; Betsy Klein, Michelle Krupa and Andy Rose, "Trump administration to halt new research grants for Harvard as battle over political ideology and academic freedom flares," *CNN*, May 7, 2025, https://www.cnn.com/2025/05/05/us/harvard-funding-trump-threats , accessed 8/19/2025.

[57] According to tallies at https://grant-witness.us/nih-data.html, accessed July 28, 2025.

[58] Potential resolution of the standoffs at Columbia and Harvard: Sharon Otterman, "Columbia Agrees to $200 Million Fine to Settle Fight With Trump," *NY Times*, July 23, 2025, https://www.nytimes.com/2025/07/23/nyregion/columbia-trump-funding-deal.html , accessed 8/19/2025; Alan Blinder, Michael S. Schmidt, and Michael C. Bender, "Harvard and White House Move Toward Potential Landmark Settlement," *NY Times*, August 11, 2025, https://www.nytimes.com/2025/08/11/us/trump-harvard-settlement-negotiations.html , accessed 8/19/2025.

As hard as the NIH funding has been hit through the various cuts and disruptions to date, the outlook for fiscal year 2026 looks much more severe. A high-level budget proposal outlining Trump administration's priorities (a so-called "skinny budget"), released May 2, 2025, set NIH research funding in FY2026 at $27 billion, down 44% from NIH's current research budget of $48.6 billion. The skinny budget had very harsh words for the NIH:

> NIH has broken the trust of the American people with wasteful spending, misleading information, risky research, and the promotion of dangerous ideologies that undermine public health. While evidence of the origins of the COVID-19 pandemic leaking from a laboratory is now confirmed by several intelligence agencies, the NIH's inability to prove that its grants to the Wuhan Institute of Virology were not complicit in such a possible leak, or get data and hold recipients of Federal funding accountable is evidence that NIH has grown too big and unfocused. Further, the NIH has been involved in dangerous gain-of-function research and failed to adequately address it, which further undermines public confidence in NIH. The NIH has also promoted radical gender ideology to the detriment of America's youth. For example, the NIH funded a study titled "Psychosocial Functioning in Transgender Youth after 2 Years of Hormones," in which two participants tragically committed suicide. The Budget proposes to reform NIH and focus NIH research activities in line with the President's commitment to MAHA…

Later in May the administration followed with a more detailed proposal of the full discretionary budget, and also posted a "Budget in Brief" at the website of the Department of Health and Human Services of which NIH is a part.[59] In the HSS Budget in Brief, NIH funding is set at 27.9 billion compared to 47 billion for FY2025, which translates as a 41% budget reduction (accounting nuances and complexities are responsible for the differences from the figures given in other sources). Such levels of NIH funding have not been seen since about 1996/1997.[60]

As outlined by the administration, the budget for FY2026 creates a completely new funding reality at NIH, a drastic change that seems likely to result in many lines of current government-funded biomedical research, especially basic research, terminated or limited. Exactly what types of projects and activities will remain unfunded by the federal government, and to what degree the administration envisions the cuts to be compensated from non-governmental sources, if at all, remains unclear. The HSS Budget in Brief strikes a generally positive note, indicating that the budget will "advance research on nutrition and other environmental factors that cause chronic conditions such as obesity, heart disease, diabetes, asthma, autism, and cancer" and claiming that NIH "will … continue to expand the number of fully-funded research project grants in 2026," but it is unclear how that could possibly be achieved with a research budget reduced by 40% or more.

The National Science Foundation

[59] https://www.hhs.gov/about/budget/fy2026/index.html , accessed July 29, 2025

[60] "National Institutes of Health (NIH) Funding: FY1996-FY2025," *Congressional Research Service*, updated June 25, 2024. Translated to constant (FY2023) dollars, the NIH budget was $26.78 billion in 1996 and $27.83 billion in 1997. By 2003, it rose to $48.54 billion and stayed at or below this plateau since. See https://sgp.fas.org/crs/misc/R43341.pdf , Table 3, p. 11, accessed 6/16/2025.

After analyzing the situation at NIH in detail, the impact of the administration's policies at the National Science Foundation (NSF) and other agencies will be discussed more briefly.

An independent federal agency, NSF is a major funder of research in non-biological sciences—physics, chemistry, mathematics, geology, computer science, engineering, and social sciences—while also supporting biological research and STEM education.[61]

The NSF's budget in recent years has been around $9 billion. For FY 2025 it would have been identical to FY 2024 budget, which stood at $9.06 billion.[62] Of that amount, $7.18 billion was awarded to research activities, $1.17 billion to educational activities, and the rest was dedicated to construction and other activities.

Since President Trump's inauguration, the new administration has enacted or attempted to enact a range of regulatory actions at NSF that were similar to those directed at NIH. On May 5, 2025, the administration implemented a policy capping indirect costs in all existing NSF awards at 15%.[63] This directive was in force only until June 20, when a federal judge struck it down as "arbitrary and capricious."[64] Regardless of the judicial setback, the 15% indirect cost cap is part of the administration's budget proposal for FY2026.

Just as it did with NIH grants, Trump's administration terminated some of the NSF grants in the course of the budget year. As of 5/7/2025, 1379 of an estimated 11-12,000 active NSF grants have been terminated, which would represent 11.5-12.5% of active NSF grants.[65]

The majority of the grant terminations, unless they were part of the government's blanket action against Columbia and Harvard Universities, appear to be motivated by the administration's

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[61] The main research and education directorates and accounts at NSF, by the descending order of funds at their disposal in 2023, include: Mathematical and Physical Sciences (MPS), $1.66 billion; Geosciences (GEO), $1.59 billion; STEM Education (EDU), $1.23 billion; Computer and Information Science and Engineering (CISE), $1.04 billion; Biology (BIO), $840 million; Engineering (ENG), $800 million; Technology, Innovation, and Partnerships (TIP), $660 million; Integrative Activities (IA), $530 million; and Social, Behavioral, and Economic Sciences (SBE), $310 million. Source: NSF, FY 2025 Budget Request to Congress, March 11, 2024, Summary Table – 3. https://www.nsf.gov/about/budget/fy2025 , downloaded 5/29/2025.

[62] Nsf.org, accessed 5/27/2025. In 2023, the actual budget was $9.54 billion, according to Federal Research and Development (R&D) Funding: FY2025 (the President's budget proposal), December 9, 2024, Table 12, page 31. In 2022, supposedly $10.17 billion (https://opengrants.io/the-nsf-grant-funding-guide/#:~:text=NSF%20archives%20their%20mission%20chiefly,and%20objective%20merit%2Dreview%20system, accessed 5/27/25).

[63] Kiley Koscinski, "Pittsburgh research institutions sue to block funding cuts from the National Science Foundation," May 6 2025, 90.5 WESA, https://www.wesa.fm/health-science-tech/2025-05-05/pittsburgh-research-grants-national-science-foundation , accessed 7/1/25

[64] "Tracking the Trump administration's moves to cap indirect research funding," June 24, 2025, Higher Ed Dive, https://www.highereddive.com/news/tracking-the-trump-administrations-moves-to-cap-indirect-research-funding/751123/ , accessed 7/11/2025.

[65] 11-12,000 are figures offered for the numbers of new NSF grants awarded every year: https://opengrants.io/the-nsf-grant-funding-guide/#:~:text=NSF%20archives%20their%20mission%20chiefly,and%20objective%20merit%2Dreview%20system, a 2022 source, accessed 5/27/25), and https://www.nsf.gov/nsb/news/news_summ.jsp?cntn_id=307818#:~:text=NSF%20made%2011%2C344%20new%2C%20competitive,significantly%20impacted%20by%20the%20pandemic (a 2023 source, accessed 5/27/25).

strong stance against DEI. Many NSF grants have promoted increased representation among researchers and students of members of underrepresented groups. This had been fully aligned with the NSF's long-term "statutory mission": in the NSF's Strategic Plan for 2022-2026, Strategic Objective 1.1 reads "Increase the involvement of communities underrepresented in STEM and enhance capacity throughout the nation."[66] (STEM is an acronym of "science, technology, engineering, and mathematics.") An apparent shortage of domestic workers in STEM fields is one of the reasons for this objective. According to a National Science Board report,

> [i]n 2021, foreign-born workers (regardless of citizenship status) accounted for 19% of the STEM workforce. Foreign-born workers accounted for 19% of workers in S&E occupations at the bachelor's degree level, 37% at the master's degree level, and 43% at the doctorate level. More than half of doctorate-level computer and mathematical scientists and engineers—occupations associated with critical and emerging technologies by the National Science Board—working in the United States were born outside the country.[67]

The strategy of attracting students and trainees from under-represented groups aims to build up domestic workforce capacity for STEM fields. However, the very project of "promoting representation" is antithetical to the priorities of the Trump administration, which has announced explicitly that it will not support—and indeed will discourage with all means at its disposal—attempts at balancing representation or group participation.

Most of the DEI grants that NSF has terminated have been focused on education, recruitment and training rather than specific research topics per se—750 of the 1379 grants are for STEM education, representing, in value, more than 70% of the terminated funds. The table below, compiled by, Grant Witness, broke down the NSF cuts by directory and account.[68]

Directorate	No. Terminated	Total Value
Biological Sciences	46	$27,960,075
Computer and Information Science and Engineering	85	$44,630,113
Engineering	94	$33,472,485
Geosciences	52	$36,454,740
Mathematical and Physical Sciences	30	$6,418,312
Office of the Director	7	$4,859,738
STEM Education	750	$773,165,249
Social, Behavioral and Economic Sciences	270	$78,532,067
Technology, Innovation and Partnerships	45	$61,031,310

[66] https://www.nsf.gov/about/performance/strategic-plan, accessed 5/27/2025.
[67] https://ncses.nsf.gov/pubs/nsb20243/talent-u-s-and-global-stem-education-and-labor-force , accessed 8/5/2025
[68] https://grant-watch.us/nsf-summary-2025-05-07.html

[Totals: inserted by JN]	1379	$1,066,524,089

The "total value" of the NSF grants terminated as of 5/7/25, $1.067 billion, is again calculated as all years of funding for multiyear grants.

Fewer research projects have been directly affected by grant termination compared to biomedical research funded by NIH, where many grant cuts zeroed in on specific research areas such as HIV research. The impact of grant cancelations on STEM education and researcher recruitment has been discussed in the media.[69]

When it comes to the administration's proposed NSF budget for FY2026, however, the research cuts are even more drastic than those for NIH. The administration's "NSF FY 2026 Budget Request to Congress" proposes to cut NSF's research and education funding from 8.3 billion to 3.3 billion, a 60% cut, which would set NSF funding back to about the late-1980s/early-1990s levels.[70] The skinny budget provides the following explanation for the proposed cuts:

> The Budget cuts funding for: climate; clean energy; woke social, behavioral, and economic sciences; and programs in low priority areas of science. NSF has fueled research with dubious public value, like speculative impacts from extreme climate scenarios and niche social studies, such as a grant to the University of Nebraska to create "affinity groups" for bird watchers and a $15.2 million grant to the University of Delaware to develop and evaluate policy interventions to "achieve sustainable equity, economic prosperity, and coastal resilience in the context of climate change." Similarly, Columbia University received $13.8 million to "advance livable, safe, and inclusive communities." Funding for Artificial Intelligence and quantum information sciences research is maintained at current levels.
>
> NSF "Broadening Participation" programs have funded projects such as: "Reimagining Educator Learning Pathways Through Storywork for Racial Equity in STEM"; "addressing White Supremacy in the STEM profession"; and preparing "the next generation of DEI leaders to promote long-term, sustainable racial equity initiatives." These efforts would no longer receive Federal dollars and all DEI-related programs at NSF are eliminated.

As with the explanation of the NIH budget cuts, the ideological concerns that are cited (here about woke sciences, climate change alarmism, and DEI) account for only a fraction of the cuts, which go far beyond the projects the concerns refer to. For example, support for chemistry research (as such) through the Directorate of Mathematical and Physical Sciences would be cut

[69] For example, Jeffrey Mervis, "NSF's grant cuts fall heaviest on scientists from underrepresented groups," *Science*, Volume 388, Issue 6749, May 2025, p. 809, https://www.science.org/content/article/nsf-s-grant-cuts-fall-heaviest-scientists-underrepresented-groups

[70] NSF 2026 budget proposal: https://www.nsf.gov/about/budget/fy2026 , accessed 7/29/25, see Summary Table 3. Historic NSF funding, see https://www.aaas.org/programs/r-d-budget-and-policy/federal-rd-budget-dashboard , accessed 6/16/2025. The figures in the dashboard represent "R&D funding," so may not include educational or administrative expenses of the NSF.

by 75%.[71] The budget for the Directorate of Computer and Information Science and Engineering—which presumably supports the research priorities of AI and quantum information sciences that the skinny budget claims "will be maintained at the current levels"—would be cut by 65%. The budget for the Directorate of Engineering would be cut by 75%.[72]

The administration's proposal for NSF funding in 2026 is currently making its way through the Congress's budgetary process.

The National Oceanic and Atmospheric Administration

The National Oceanic and Atmospheric Administration, NOAA, is part of the Department of Commerce. It accounts, or has accounted, for more than half of that Department's budget: in FY2025, it has been managing $6 billion out of the departmental budget of $10.2 billion.[73] Its aims are to monitor and study atmospheric and oceanic phenomena across scientific disciplines (from physics to biology), provide monitoring and forecasting services to the public, identify social and economic impacts of atmospheric and oceanic changes and dynamics, and work on solutions to problems that arise if those impacts are negative. In its own estimation, NOAA's products and services "affect more than one-third of America's gross domestic product," are essential for "economic vitality," and the agency "holds key leadership roles in shaping international ocean, fisheries, climate, space and weather policies." [74]

The administration's policies on NOAA seem closely aligned with the Project 2025 recommendations. According to Project 2025,

> [NOAA's offices] form a colossal operation that has become one of the main drivers of the climate change alarm industry and, as such, is harmful to future U.S. prosperity. This industry's mission emphasis on prediction and management seems designed around the fatal conceit of planning for the unplannable. That is not to say NOAA is useless, but its current organization corrupts its useful functions. It should be broken up and downsized.
>
> NOAA today boasts that it is a provider of environmental information services, a provider of environmental stewardship services, and a leader in applied scientific research. Each of these functions could be provided commercially, likely at lower cost and higher quality.[75]

Overall, the administration's stance is that it must a put a stop to "climate alarmism" and replace it with "climate realism." In its view, the realistic cost-benefit analysis of economic activities and

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[71] Rebecca Trager, "NSF chemistry funding faces 75% cut under Trump budget request," 4 June 2025, *Chemistry World*. https://www.chemistryworld.com/news/nsf-chemistry-funding-faces-75-cut-under-trump-budget-request/4021606.article , accessed 6/27/25; Rebecca Trager, " 'Deeply concerned': Are chemistry departments across the US at real risk of closure?", 20 June 2025, *Chemistry World.* https://www.chemistryworld.com/news/deeply-concerned-are-chemistry-departments-across-the-us-at-real-risk-of-closure/4021717.article , accessed 6/27/2025.

[72] https://www.nsf.gov/about/budget/fy2026 , accessed 7/29/25, see Summary Table 3.

[73] Austyn Gaffney, "White House Plan Calls for NOAA Research Programs to Be Dismantled," April 13, 2025, *NYT*, https://www.nytimes.com/2025/04/11/climate/noaa-research-budget-cuts.html , accessed 5/28/25;

[74] https://www.noaa.gov/about-our-agency , accessed 5/28/25

[75] Project 2025, pp. 674-675.

their climate effects tilts decisively toward an overall benefit. As the Energy Secretary Chris Wright has said, "The Trump administration will treat climate change for what it is, a global physical phenomenon that is a side effect of building the modern world."[76]

The administration has already started cutting NOAA's staff and activities and has terminated some existing research grants. At Princeton University, for example, three active NOAA grants have been terminated, with a combined worth of $4 million. One of the grants is for an educational project about climate aimed at schoolchildren, run through Princeton's Cooperative Institute for Modeling the Earth System (CIMES): the administration stated that the project promoted "exaggerated and implausible climate threats, contributing to a phenomenon known as 'climate anxiety,' which has increased significantly among America's youth. Its focus on alarming climate scenarios fosters fear rather than rational, balanced discussion." The other two grants involved two climate modeling projects on which Princeton researchers collaborated with NOAA's Geophysical Fluid Dynamics Laboratory. One models water availability, predicting that climate change will lead to decreasing "evenness in water distribution" in the future, i.e., to a greater incidence of both droughts and floods. The administration's termination rationale states that "using federal funds to perpetuate these narratives does not align with the priorities of this Administration and such time and resources can be better utilized elsewhere." The final modeling project, according to the administration, "aims to address coastal inundation while other more targeted research efforts are addressing this issue. Additionally, the cost of simulating this program's specific atmosphere-ocean-wave interactions is exceedingly high, diverting resources from more practical and cost-effective solutions."

There is also the goal of replacing some of the government-supported services run by the NOAA by privately run services. As of May 28, 2025, 24 databases maintained by NOAA had been decommissioned, retired, suspended, removed, or were no longer to be updated (the detailed summary can be found in the footnote.)[77] Among the terminated databases are, for example, the "Billion Dollar Weather and Climate Disasters" database which contains information on all U.S.

[76] https://www.energy.gov/articles/secretary-energy-chris-wright-delivers-keynote-remarks-ceraweek-2025#:~:text=This%20is%20simply%20wrong.,of%20building%20the%20modern%20world.

[77] https://www.nesdis.noaa.gov/about/documents-reports/notice-of-changes?page=0 , accessed 5/28/2025. The databases, datasets, and tools include: POES (The Polar Operational Environmental Satellites); Manual Dvorak Estimates in the South Atlantic Ocean (estimating tropical cyclone intensity); Billion Dollar Weather and Climate Disasters; Cloud Properties - ISCCP H-Series CDR (International Satellite Cloud Climatology Project (ISCCP) H-Series Climate Data Record (CDR) focuses on the distribution and variation of cloud radiative properties); HURSAT (hurricane satellite data); nClimGrid-Daily (gridded fields and area averages of daily maximum, minimum, and average temperatures (Tmax, Tmin, and Tavg) and daily precipitation amount (Prcp) for the Contiguous United States); POES SEM-2 data (The Space Environment Monitor-2 (SEM-2), which was first launched on the NOAA-15 satellite and flies on the MetOp-A, -B and -C, is an upgraded version of Space Environment Monitor-1 (SEM-1)); NOAA Marine Environmental Buoy Database; Global Ocean Currents Database (GOCD); OceanNOMADS (ocean models); WSA-Enlil, NCEI Archival copy (solar wind prediction); Estuarine Bathymetry; Total Sediment Thickness for the World's Oceans and Marginal Seas; Geological History of the World's Oceanic Crust; Circum-Antarctic Paleobathymetry to 30° South: Present to 75my; Index to Marine and Lacustrine Geological Samples (IMLGS); Thermal (geothermal) Hot Springs List for the United States; Seismicity Catalog Collection; Strong Motion Earthquake Data Values of Digitized Strong-Motion Accelerograms; United States Earthquake Intensity Database; Coastline Extractor (a tool that allowed users to specify an area of interest and extract coastline data from the Global Self-consistent, Hierarchical, High-resolution Geography Database (GSHHG)--per google AI); Shoreline/Coastline Resources; NCEI Coastal Ecosystem Maps; NCEI Coastal Water Temperature Guide

natural disasters—droughts, floods, freezes, severe storms, hurricanes, wildfires, winter storms—whose damage has exceeded $1 billion (403 events between 1980 and 2024), and the Global Ocean Currents Database, which "integrates ocean current data from a wide variety of capture methods, resolutions, and formats into a single format (NetCDF) archive" and " gives scientists and researchers a comprehensive depiction of global current activity and structure. It also allows ocean modelers, ocean resource managers, and the shipping industry quantify the impact of currents on their operations."

The administration wants to drastically reorganize NOAA from fiscal year 2026 onwards. The skinny budget provides the following commentary on the need for reforming NOAA's funding:

> The Budget terminates a variety of climate-dominated research, data, and grant programs, which are not aligned with Administration policy-ending "Green New Deal" initiatives. For example, NOAA's educational grant programs have consistently funded efforts to radicalize students against markets and spread environmental alarm. NOAA has funded such organizations as the Ocean Conservancy and One Cool Earth that have pushed agendas harmful to America's fishing industries. These NOAA grants were funding things such as: George Mason University's "Policy Experience in Equity Climate and Health" fellowship, a workshop for "transgender women, and those who identify as non-binary," and NOAA Climate Adaptation Partnerships, which funded webinars that promoted a children's book "designed to foster conversations about climate anxiety" as therapy.
>
> The Budget rescopes NOAA's Geostationary and Extended Observations satellite program to achieve nearly $8 billion in lifecycle cost savings, and cancels contracts for instruments designed primarily for unnecessary climate measurements rather than weather observations.

In an early budget draft for FY2026 from April 2025, the administration has proposed to eliminate the main research division of NOAA, the Oceanic and Atmospheric Research (OAR) office, cutting overall funds for research from $485 million (where they stood in FY 2024) to $171 million, and transferring the remaining research activities—tornado warning and ocean acidification have been mentioned in the press—to other offices within or even outside NOAA. The total NOAA budget would be cut from $6 billion to $4.4 billion, i.e. by about 27%.[78] The National Marine Fisheries Service would be moved from NOAA into the Interior Department's US Fish and Wildlife Service, lose $324 million in funds, its conservation-themed activities such as species recovery and habitat conservation would no longer be supported, and it would be asked to support the administration priority of "unleashing American energy," i.e., presumably not pit conservationist and environmentalist concerns against coastal oil and gas extraction plans. The National Ocean Service's budget would be cut by half, research and programs concerned

[78] Austyn Gaffney, "White House Plan Calls for NOAA Research Programs to Be Dismantled," April 13, 2025, NYT, https://www.nytimes.com/2025/04/11/climate/noaa-research-budget-cuts.html , accessed 5/28/25; Paul Voosen, "Trump Seeks to End Climate Research at a Premier US Climate Agency," March 10, 2025, *Science*, vol. 388, issue 6744, https://www.science.org/content/article/trump-seeks-end-climate-research-premier-u-s-climate-agency#:~:text=The%20administration's%20plan%20would%20%E2%80%9Celiminate,a%20host%20of%20research%20efforts. (accessed 5/27/25);

with coastal health would be curtailed,[79] and research into the effects of climate change and sea-level rise would lose all funding. Funding for the National Centers for Environmental Information would be cut by a quarter; in fact, many of NCEI's databases and tools that have been available to the public have already been decommissioned—see below for details. The Space Weather Prediction Center would be moved to the Department of Homeland Security, the Traffic Coordination System for Space intended to regulate satellite traffic will be defunded and its functions taken over by the private sector, as would, it seems, others hitherto supported publicly through the NOAA. All funding would be withdrawn from NOAA's 10 climate, weather, and ocean laboratories; the 10 include ocean research centers, atmospheric science labs, a severe storm lab, a lab focused on the Great Lakes, and the Geophysical Fluid Dynamics Laboratory in Princeton, NJ, "a birthplace of weather and climate modeling" according to the *Science* magazine.

Cuts are also proposed to satellite data collection programs: for example, the next generation of geostationary satellites will be retooled to only carry instruments for collecting "weather" data but not instruments to measure air pollution or ocean color (used to detect, for example, algal blooms) and it is also proposed that the relationship between NOAA and NASA which has allowed NOAA instruments to be placed with NASA launched satellites be discontinued. Overall, NOAA's support for satellite and data systems would be reduced by $141 million, and for the National Center for Environmental Data—an archive and a system of databases—by $18 million.

The National Aeronautics and Space Administration

U.S.'s vaunted National Aeronautics and Space Administration, NASA, is subject to proposed cuts as well.[80] The overall cuts proposed by the administration for fiscal year 2026 amount to $6 billion, or 24% of the current budget year's NASA budget (FY2026 proposed: $18.8 billion; FY2025: $24.8 billion). There will be some increased investments, notably toward "Mars-

[79] In the *Science* article: " '[N]o funding for Integrated Ocean Observing System Regional Observations, Competitive Research, Coastal Zone Management Grants, National Coastal Resilience Fund, or the National Estuarine Research Reserve System.' The requests would also close the National Centers for Coastal Ocean Science."

[80] Paul Voosen, "Trump Seeks to End Climate Research at a Premier US Climate Agency," March 10, 2025, *Science*, vol. 388, issue 6744, https://www.science.org/content/article/trump-seeks-end-climate-research-premier-u-s-climate-agency#:~:text=The%20administration's%20plan%20would%20%E2%80%9Celiminate,a%20host%20of%20research%20efforts. (accessed 5/27/25); Eric Berger, "Trump White House budget proposal eviscerates science funding at NASA," *Ars Technica,* Apr. 11, 2025, https://arstechnica.com/space/2025/04/trump-white-house-budget-proposal-eviscerates-science-funding-at-nasa/ , (accessed 5/28/25); The President's FY 2026 Discretionary Budget Request, https://www.whitehouse.gov/omb/information-resources/budget/the-presidents-fy-2026-discretionary-budget-request/ , accessed 5/29/2025; Tim Fernholz, "Trump's "Skinny" Space Budget Winners and Losers," May 5, 2025, https://payloadspace.com/trumps-skinny-space-budget-winners-and-losers/ , *Payload*, accessed 5/29/25; Robert Zubrin, "Trump assaults American space science," *SpaceNews*, May 9, 2025, https://spacenews.com/trump-assaults-american-space-science/ , accessed 5/29/25; Kenneth Chang, "NASA Proposal Would Shift Agency's Focus Away From Space Science," *NY Times*, May 2, 2025, https://www.nytimes.com/2025/05/02/us/politics/trump-budget-nasa-cuts.html ,
accessed 5/29/25; Richard Luscombe, "Universe's mysteries may never be solved because of Trump's Nasa cuts, experts say," *The Guardian*, 29 May 2025, https://www.theguardian.com/us-news/2025/may/29/trump-nasa-cuts , accessed 5/29/25

focused projects" (including, prominently, a manned mission to Mars), but many more cuts—ostensibly to support the Mars mission priority. For example, plans for a sustainable lunar presence would not be pursued.

Important development projects would be terminated, including notably stopping the support for the Space Launch System (SLS) and the Orion capsule after accomplishing a Moon return mission that would "beat China" to that goal. The rationale given by the administration is that those projects are too costly and are better replaced with commercially developed systems (commentators mention SpaceX or Blue Origin as the obvious candidates). $1.1 billion would also be cut in the area of "mission support," as NASA would "streamline the workforce, IT services, NASA Center operations, facility maintenance, and construction and environmental compliance activities."

NASA's research activities would be particularly heavily affected, with the budget for NASA's Space Science Directorate cut by 48%, from $7.3 billion to $3.8 billion. The budget for space science (planetary, astrophysics, and heliophysics) would be cut by more than 40%, and that for Earth science by more than 50%. The new Nancy Grace Roman space telescope, already developed and partly assembled, will not be launched, support for the Hubble Space Telescope will likely cease, and the operations of the more recently launched Webb Space Telescope will be curtailed. The current Mars Sample Return Mission will be discontinued, its goals apparently subsumed by the planned human mission to Mars (which still exists just on paper). Interstellar missions (Voyager and New Horizons) will likely be abandoned. The DAVINCI mission to Venus will also be no longer funded. In Earth science, support for NASA's satellite's program would be reduced to do away with the collection of "climate data," and the Goddard Space Flight Center in Maryland, involved in Earth science, would be closed.

Overall, the rationales are a combination of arguments about climate alarmism, excessive costliness best solved by delegating crucial activities to private entities, and the new priorities of beating China to the Moon as well as pursuing a Mars mission. The overall demand for the development of space technology will decline, raising concerns from the aerospace industry that the "space supply chain" will be disrupted and with it an important source of U.S. "innovative edge," while other observers point out the cuts will cause a talent drain in areas important not just to space exploration but also to defense technology and beyond. In this context, however, it needs noting that the budget for the Department of Defense is increasing, and with it the government investment in developing new military technologies.

The Department of Defense

R&D support channeled through the Department of Defense presents an interesting case because unlike most government agencies, DOD as a whole is expected to receive *increased* funding from the government in FY2026. The estimated increase of $113 billion, or 13%, is driven by an increased defense spending allocation in the mandatory spending bill (the One Big Beautiful Bill) rather than the discretionary budget. Will the funding increases at DOD include increases to R&D projects, and which projects might those be? Will the extra funds be spent on developing specific weapons systems, or will some be channeled toward more general R&D?

As noted above, the Department of Defense traditionally receives more R&D funds than any other government agency. In FY2024, DOD received US $91 billion in R&D funds from the US Budget, 46% of all federal R&D funds (compared with HSS's 26%).[81] For background, let's briefly look at how these funds are spent by DOD generally.

There is one important qualification to keep in mind. DOD's internal criteria of what broadly counts as research and development expenses *differ* from the general U.S. government criteria. DOD uses internal accounting codes 6.1 through 6.8 to classify expenses related to what it calls "Research, development, testing, and evaluation" (RDT&E). However, in federal government accounting, DOD's codes 6.7 and 6.8 are excluded from the R&D category.[82] 6.7 denotes expenses used to improve existing operational defense systems, while 6.8 denotes expenses used to pilot and test software and digital technologies. These additional "non-experimental development" funds under 6.7 and 6.8 are substantial, totaling $51 billion for FY2024. In other words, in FY2024 DOD received $91 billion for R&D proper, but also an additional $51 billion to test and improve existing systems, and so reported a $142 billion budget for RDT&E.[83]

The $91 billion that DOD spent under codes 6.1-6.6 (R&D proper) in 2024 can be broken down by more specific categories. The funds for basic research, applied research, and experimental technological development (6.1, 6.2. and 6.3) totaled about $21 billion, of which $2.6 billion supported basic research, $7.6 billion applied research, and $11.3 billion technology development. A much greater share of DOD R&D funds, about $70 billion, was spent on the development of operational defense systems and components and on their testing and evaluation (activities 6.4-6.6).[84]

Clearly, the large majority of RDT&E funding at DOD is channeled toward the development and improvement of specific operational defense components and systems rather than to more general R&D. That is not unexpected. The development of operational systems is expensive. Many component and system items in DOD's budget are orders of magnitude larger than items under general R&D. For example, in FY2024, several DOD's RDT&E requests related to components and systems exceeded $2 billion apiece: F35 fighter jet (2.5 bil), B-21 Raider bomber (3 bil), Cyberspace Activities (3 bil), Ground-based Midcourse Defense (a missile defense system) (3.1 bil), LGM-35A Sentinel (strategic nuclear missile system) (3.7 bil), Space-Based Missile Warning Systems (4.9 bil), Satellite Communications Projects (SATCOM) (4.1 bil).[85]

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[81] Federal Research and Development (R&D) Funding: FY2025 (the President's budget proposal), pp. 4-5.
[82] "Department of Defense Research, Development, Test, and Evaluation (RDT&E): Appropriations Structure," 9/7/2022, https://www.congress.gov/crs-product/R44711 , accessed 7/30/2025.
[83] Federal Research and Development (R&D) Funding: FY2025 (the President's budget proposal), Table 1 and Table 8.
[84] Federal Research and Development (R&D) Funding: FY2025 (the President's budget proposal), Table 8, pp. 16-17. (The values for DOD "enacted" R&D FY2024 expenses in Table 9, codes 6.1-6.6, add up to about 97 bil, which for some reason differs from the 91 bil figure (budget authority) in Table 1; I assume they include R&D funding authorized by other legislation.
[85] "Program Acquisition Cost by Weapon System, United States Department of Defense Fiscal Year 2024 Budget Request," Office of the Under Secretary of Defense (Comptroller)/Chief Financial Officer, March 2023. https://comptroller.defense.gov/Budget-Materials/Budget2024/ , accessed 8/5/2025.

Yet even if DOD's funding for more general R&D is a minor fraction of DOD's RDT&E budget, it is still a major source of funds for university-based R&D in several fields: industrial and manufacturing engineering (64%); aerospace, aeronautical, and astronautical engineering (62%); electrical, electronic, and communications engineering (58%); metallurgical and materials engineering (48%); mechanical engineering (47%); computer and information sciences (46%); and materials science (38%).[86] More than half of DOD-funded basic research is carried out at universities.[87]

General R&D funds are dispensed through R&D offices in DOD's departments such as the Navy, the Army, or the Air Force, but some are funneled through special programs, such as the well-known DARPA, or the lesser-known MURI and SERDP. The Defense Advanced Projects Research Agency (DARPA) is tasked with high risk/high reward, cutting edge research, and is famously credited for funding research that had led to the development of the Internet and the GPS. In recent years, about half of the funds allocated by DARPA have gone to development, 38% to applied research, and 12% to basic research (figures for FY2022, when DARPA's total funds were $3.6 billion).[88] The Multidisciplinary University Research Initiative (MURI) includes university projects that often involve collaboration across academic disciplines.[89] A sampling of the many research topics currently funded through MURI might include investigations of hyperuniform materials and networks (with applications in photonics, for example); the modeling of social dynamics (social movements, extremism, epidemics); environmental films forming on solid/gas interfaces (corrosion, contamination/decontamination); or problem-solving in autonomous systems (robotics, autonomous machines/weapons operating over a long term while solving new problems as they emerge).[90] Strategic Environmental Research and Development Program (SERDP), another DOD program, is "focused on improving the chemical and material resilience of … weapons systems and platforms." SERDP has for example funded research into breaking down environmental pollutants ("forever chemicals" such as PFAS) that contaminate military sites.[91]

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[86] Federal Research and Development (R&D) Funding: FY2025 (the President's budget proposal), p. 16. The figures are for FY2022.

[87] *Ibid.*, p. 15.

[88] For more on DARPA and agencies modeled after it, see Janika Schmitt and Jake Swett, "The ARPA Model: A Reading List," January 31, 2024, *The Institute for Progress*, https://ifp.org/the-arpa-model-a-reading-list/#darpa , accessed 7/30/25. Darpa spending 2022: Analysis of Department of Defense Funding for R&D and RDT&E in FY 2022, NSF 25-301, October 2024, Christopher V. Pece. Pp. 4-5.

[89] DOD News Release announcing MURI awards for FY2024, https://www.defense.gov/News/Releases/Release/Article/3700836/department-of-defense-announces-fiscal-year-2024-university-research-funding-aw/ (accessed 5/2/25). For the list of MURI-funded projects selected in FY2024, see https://media.defense.gov/2024/Mar/08/2003409172/-1/-1/1/FY24_MURI_FINAL.PDF

[90] The principal researchers associated with these MURI-funded projects include Salvatore Torquato at Princeton University (hyperuniformity), P. Jeffrey Brantingham at UCLA (social modeling), Scott Shaw at the University of Iowa (environmental films), and David Held at Carnegie Mellon University and George Konidaris at Brown University (robotics). For more details on their research, look up their publications. The last two MURI topics were chosen for FY2024, the first two in prior years.

[91] The Strategic Environmental Research and Development Program (SERDP) and the Environmental Security Technology Certification Program (ESTCP), https://serdp-estcp.mil/about , accessed 7/30/25; Prachi Patel, "The PFAS remediation researcher with a field test on pause," *Chemical and Engineering News*, May 28, 2025, https://cen.acs.org/people/profiles/PFAS-remediation-researcher-field-test/103/web/2025/05 , accessed 7/16/25;

What is the outlook for the fiscal year 2026? The president indicated an increase in DOD spending in the skinny budget in early May; DOD sent a more detailed budget proposal to Congress in June; and the House of Representatives came up with its own discretionary budget proposal.[92] AAAS tracks the latest developments of the budget negotiations in its dashboard.[93] Based on the available sources, several things seem likely. First, DOD's RDT&E budget in 2026 will increase significantly: the DOD proposed a $38 billion increase, for the total of **$179 billion**. Second, much of the increase in RDT&E spending—$37 billion—would be funded by the mandatory spending bill (OBBB). Next, much of the increased spending would be used for the development of operational components and systems, even though the Congress and the administration do not always agree on which systems those will be. For example, the administration proposes to up the Air Force RDT&E funding by $15 billion to about $62 billion, of which $3.5 billion would be spent on F-47, a new stealth fighter and one of the signature projects of the administration, $4.7 billion on the B-21 stealth bomber, etcetera. For the new F/A-XX Navy strike fighter, however, the Congress seeks $900 million more than the administration proposes. Some increases are indeed earmarked for more general R&D spending. For example, DOD proposes that the DARPA funding should go up from $4.1 billion to $4.9 billion. However, according to the AAAS dashboard, both the DOD proposal and the House of Representative's proposal currently include an overall *cut* in DOD funding for general R&D. Overall, then, it seems fair to conclude so far that the increased funding will be mainly funneled toward developing and improving operational components and systems, and while some more general R&D projects may see a funding increase, others may see a decrease.

It is important to note, however, that until 2017, current RDT&E activities 6.7 and 6.8 at DOD *were* counted as part of the federal R&D budget. If we imagined for a minute that this had not changed, the proposed 2026 funding for 6.7 and 6.8 would add roughly $18 billion dollars to the presidential R&D budget proposal.[94] Then the overall R&D cut would no longer appear as large as 22%—it would be only 15%. That is significant in interpreting the overall picture: the president's budget proposal is not so much a vehicle for slashing *all* R&D funding, broadly understood, but rather a way to *redirect* large funds from non-defense research to defense development. By my very crude calculation, the budget proposal adds $38 billion to advanced defense-related development (DOD activities 6.4-6.8), while taking away $64 billion from all other federal-funded R&D activities, relative to the previous budget.[95]

XiaoZhi Lim, "Can microbes save us from PFAS?", *Chemical and Engineering News*, March 21, 2021, https://cen.acs.org/environment/persistent-pollutants/microbes-save-us-PFAS/99/i10 , accessed 7/16/25.

[92] Aaron Mehta, "EXCLUSIVE: Pentagon's RDT&E budget revealed – Which next-gen systems get a cash influx in FY26?," June 9, 2025, *Breaking Defense*, https://breakingdefense.com/2025/06/exclusive-pentagons-rdte-budget-revealed-which-next-gen-systems-get-a-cash-influx-in-fy26/#:~:text=The%20department%20is%20requesting%20$142,highlights%20from%20the%20RDT&E%20budget , accessed 7/30/25; H. Rept. 119-162 - DEPARTMENT OF DEFENSE APPROPRIATIONS ACT, 2026, https://www.congress.gov/committee-report/119th-congress/house-report/162/1?outputFormat=pdf , accessed 7/30/2025.

[93] https://www.aaas.org/news/fy-2026-rd-appropriations-dashboard#, accessed 7/30/2025.

[94] My estimate based on the AAAS dashboard.

[95] In the last budget there was $71 billion spent on DOD's 6.4-6.6, which left $127 billion for all other R&D spending. In the 2026 budget, 6.4-6.6 appear to get $20 billion more for the total of $91 billion, which leaves $63 billion (out of the total R&D budget of $154 billion) for all other R&D spending. Activities 6.7-6.8 would receive $18 billion more.

Final Thoughts

The administration's actions so far—staff cuts at government agencies, grant terminations, attacks on universities—have been taken in the name of reasserting democratic control over elitist enterprises. The abrupt funding withdrawals have destabilized domestic R&D, but that seems to have been the point; R&D in the United States is a patronage system, as has been observed, and here the patron—the state—seems to have been reminding the client—the R&D community—of this fact. Part of the American public has reacted to the loss of jobs and job stability among government and university employees and grantees with a degree of schadenfreude; for many Americans, a lack of job stability is a fact of life, especially in non-professional occupations. Several ideological rationales the state used for its interventions concern topics such as DEI policies, affirmative action, or a proper response to climate change on which the American public is divided, and which have held the center place in electoral contests for years.

That a newly elected administration would impose policy changes in line with its majority mandate, even in generally controversial areas, is not unexpected. On the other hand, the speed and abruptness of the interventions, their high-handedness, indifference to consequences in medical care cuts, and the fact the administration has not acted in concert with but rather in opposition to the Congress and the courts are remarkable. For all its reformist zeal, Project 2025 enjoined the Republican president-to-be to "do away with abuses of presidential power" and ensure the Congress is restored to its constitutionally mandated place as the most powerful branch of the government.[96]

What is being proposed for the future, however, goes far beyond changes in policies on controversial subjects. The administration wants to significantly *defund* R&D, particularly basic research. When one looks backwards, it is easy to see how today's important technologies have grown out of past basic research; but it is much harder to see what benefits this or that piece of basic research done today might bring someday in the future. In other words, the benefits of basic research are difficult to metricize, yet a belief has prevailed for a long time that a broad spectrum of basic research is well worth funding—for all the unimagined and wonderful inventions it might inspire, for the knowledge itself. Engineer and science administrator Vannevar Bush, who inspired the US post-war policy of government support for science, articulated that belief in his influential 1945 report *Science, The Endless Frontier* as follows:

> We want plenty of new, vigorous enterprises. But new products and processes are not born full-grown. They are founded on new principles and new conceptions which in turn result from basic scientific research. Basic scientific research is scientific capital… Today, it is truer than ever that basic research is the pacemaker of technological progress.[97]

That conviction seems to be gone. What used to count as national achievement and investment is now seen as no more than ornament, an unnecessary indulgence.

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[96] Project 2025, pp. 7-9.

[97] Vannevar Bush, *Science, The Endless Frontier*, 75th anniversary edition, *NSF*, 2020, https://nsf-gov-resources.nsf.gov/2023-04/EndlessFrontier75th_w.pdf , quotes from pp. 2 and 17.

It has been noted that this administration approaches cutting expenses as a private company would: cut first, cut fast, and stop cutting only when you observe a loss of economic productivity. The market itself will tell you what the right size of the cost base is. But how can the economic productivity of basic research be measured within the short time frame of the ongoing cuts? How are the cutters to know what the right size is, and when to stop cutting? How do they even know they should have started cutting in the first place?

The critics of the administration speak of the costs that the cuts have inflicted. In the case of cuts to medical research, some even argue that the cost can be measured in human lives left unsaved, lost. The cuts cost lives, goes the argument, but it is not altogether convincing. If the NIH budget were 1 trillion dollars, it would surely produce more life-saving research than it does currently; but no one uses that argument to call for a trillion-dollar NIH budget. Resources are always limited; how much is actually spent is a matter of reasonable compromise. But the reasonable compromise concerning US government science funding that has prevailed for many years is being abandoned by the Trump administration. Basic and other research are being downsized, with difficult-to-predict consequences for science and the economy in the US and around the world. Perhaps the next government will be run by the other major US party, the Democrats, and it will restore R&D funding to pre-Trump levels. Or perhaps the Republicans will remain in power for another cycle. Either way, will a new stability, a new reasonable compromise in R&D funding, be achieved? Or will the R&D budget in the United States yo-yo with every government change?