

TREND SCAN

U.S. Research Funding Disruption

Strategic implications for innovation, talent, and competitiveness

Federal science and health research funding in the United States is undergoing a significant disruption. This scan examines six analytically distinct dimensions of that disruption, separates proposed reductions from enacted appropriations, and sets out four trajectories with the indicators that would distinguish them.

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Executive Summary

Federal science and health research funding in the United States is undergoing a significant disruption driven by both proposed budget reductions and administrative actions. The Trump administration's FY 2026 budget proposals called for a 22 percent reduction in overall federal R&D funding, with steeper proposed cuts to the National Institutes of Health (NIH, -43%), the National Science Foundation (NSF, -56%), and the Department of Energy Office of Science (-14%).¹ While Congress has, as of early 2026, largely rejected the deepest proposed cuts—providing NIH with a modest \$415 million increase to \$47.2 billion for FY 2026—the administration has concurrently pursued administrative grant terminations, indirect cost caps, and agency reorganizations that have already materially affected the research ecosystem.^{2,3}

While the current disruption is notable for its speed and multi-channel execution, historical comparisons provide useful context. Prior episodes—including the 2013 sequestration, the late-1990s NIH budget plateau following a period of rapid growth, and the post-2008 financial crisis funding constraints—were associated with slowed research activity, reduced grant success rates, and delayed workforce expansion, but were followed by partial recovery over multi-year time horizons. In contrast, the present environment combines proposed budget reductions with administrative actions and global competitive pressures, suggesting a more complex recovery trajectory that may differ from these earlier cyclical disruptions.^{52,53}

As of mid-2025, more than 3,800 NIH and NSF research grants had been terminated or frozen, representing over \$3 billion in rescinded funding.⁴ Academic medical centers, research universities, and public health agencies have responded with widespread hiring freezes, layoffs, and curtailed clinical trials. Independent economic analyses indicate that the direct and indirect costs of this disruption—measured in lost GDP, employment, and foregone health improvements—substantially exceed any near-term fiscal savings.^{5,6}

The distinction between proposed reductions and enacted appropriations is central to interpreting the trend. Headline congressional outcomes have moderated some budget proposals, but administrative actions, grant terminations, rescissions, and uncertainty around indirect costs may still reduce operational capacity in ways not fully captured by enacted funding levels.

Biomedical and life sciences research appears among the most exposed areas because of its dependence on NIH funding and the role of academic medical centers in sustaining translational pipelines. However, the impact of federal research disruption is not limited to pharmaceutical development. Available evidence also points to effects across public health, STEM education, environmental science, physical sciences, social sciences, research infrastructure, and workforce development, suggesting a broad research-system disruption rather than a narrowly pharmaceutical one.

Against this backdrop, international competition for scientific leadership is intensifying. China's total R&D investment exceeded \$569 billion in 2025, growing at 8% or more annually, and the country has committed to sustaining at least 7% annual R&D growth through 2030.⁷ The European Union, Canada, Germany, France, and others are launching targeted programs to recruit U.S.-based researchers.⁸ Early evidence suggests a

measurable increase in scientist emigration interest, with 75% of U.S.-based scientists surveyed by Nature in 2025 indicating they were considering leaving the country.⁹

This trend scan examines six analytically distinct dimensions of this disruption: the mechanics and governance of funding reductions; workforce and talent dynamics; public health infrastructure; international competitive positioning; alternative and emerging funding pathways; and the evolving landscape of trust in science and scientific exchange. For each dimension, the scan describes observable conditions, notes areas of uncertainty, and identifies strategic considerations. Language reflects the inherently fluid and evolving nature of this policy environment.

For organizations dependent on scientific infrastructure, the relevance of this trend lies in the potential weakening of the upstream systems that generate evidence, sustain specialized expertise, support clinical and public health research, and enable consistent methods, materials, and quality expectations across research and regulatory ecosystems.

Taken together, available evidence suggests that current disruptions represent less a single budget event than a structural shift in the U.S. research system. The interaction of administrative actions, funding volatility, workforce instability, public health capacity constraints, and global competitive pressures may indicate a transition toward a more fragmented and less predictable scientific environment, with potential implications for standards, public health, regulatory, and research ecosystems.

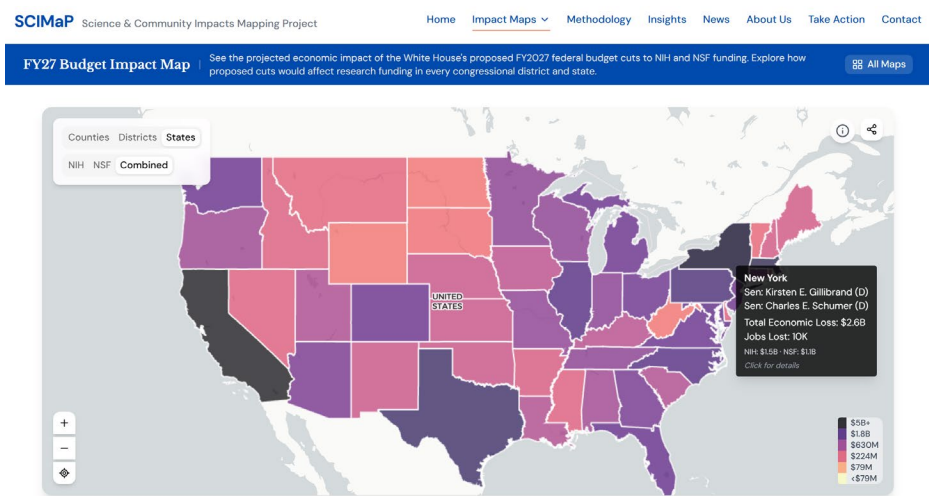


Figure 1. FY27 Budget Impact Map <https://scienceimpacts.org/fy27>

Definition and Framing

Scale & Nature of the Cuts

The United States federal government has historically been the world's largest single public funder of scientific research. Federal investment in non-defense R&D has underpinned the country's post-war scientific preeminence, supporting basic research that the private sector is generally unwilling to fund due to uncertain

commercial timelines. The current disruption is notable for its speed, breadth, and the degree to which it operates through both legislative proposal and executive administrative action simultaneously. This characterization is consistent with analyses from organizations such as the OECD and AAAS, which have historically identified the United States as one of the largest public funders of scientific research globally.^{54,55}

The FY 2026 President's Budget Request, released in May 2025, proposed reductions across virtually all civilian science agencies:¹

Agency / Program	FY 2025 Enacted	FY 2026 Proposed	Proposed Change	Congressional Outcome (FY 2026)
NIH	~\$46.8B	\$27.5B	-43%	\$47.2B (+~1%) ^{2,3}
NSF	~\$9.0B	\$3.9B	-57%	~\$8.8B ¹⁰
DOE Office of Science	\$8.24B	\$7.09B	-14%	House: \$8.4B (+2%) ¹¹
CDC	>\$9B	~\$4.5B	-53%	\$9.2B (level) ²
NASA Science	N/A	N/A	-47%	Under negotiation
NIST	\$1.46B	\$839M	-43%	Under negotiation
Non-Defense R&D (total)	~\$200B	~\$156B	-22%	~3–7% decrease ¹²

Table 1. Federal science agency budget proposals vs. enacted FY 2026 funding.

Congressional action has—at least for FY 2026—significantly moderated the severity of the proposed cuts to headline agency budgets. However, this moderating response addresses only one dimension of the disruption. The administration has pursued parallel administrative strategies, including termination of individual grants on ideological grounds and proposed caps on indirect cost recovery, that operate independently of the appropriations process.

The Indirect Cost Mechanism

Indirect costs (also called facilities and administrative costs, or F&A) represent reimbursements that federal agencies pay to research institutions for overhead expenditures—building operations, laboratory utilities, compliance infrastructure, and data management—that support multiple sponsored research projects simultaneously. In February 2025, the NIH issued guidance capping indirect cost recovery at 15% of direct costs for all ongoing and new grants. The effective average indirect cost rate across major research universities has historically been approximately 42%.¹³ The proposed cap was immediately challenged in federal court and is currently under injunction, but it has continued to create uncertainty for institutional planning.

An IMPLAN economic analysis estimated that a 15% cap would reduce NIH-related funding by approximately \$5.5 billion annually, triggering a \$6.1 billion decrease in GDP and the loss of approximately 46,000 jobs across direct, indirect, and induced economic effects.¹³ The Science Philanthropy Alliance estimates that federal agencies spent \$63.6 billion on research at academic institutions in 2024; the indirect cost cap, if enacted, would represent a structural reduction of that investment by roughly 15% beyond the nominal grant budget.¹⁴

The funding figures provide the quantitative baseline for the trend; the following section examines the governance mechanisms that determine how those proposed and enacted levels translate into operational effects for research institutions.

Policy Context and Governance Environment

Administrative Rationale

The funding reductions appear to reflect several overlapping policy rationales. First, fiscal consolidation arguments frame research cuts as part of a broader effort to reduce discretionary federal spending without touching entitlement programs.¹ Second, a re-prioritization argument holds that federal R&D dollars should shift toward defense-related, commercially applicable, and national security-aligned work, with basic and exploratory science deprioritized in the expectation that private markets will fill the gap.^{1,15} Third, some policy actors have framed certain research areas—particularly those involving health equity, environmental science, social and behavioral research, and public health preparedness—as ideologically misaligned with current administration priorities, resulting in targeted grant terminations rather than across-the-board budget reductions.

Some policy proposals and administrative actions have also introduced, or proposed introducing, additional review of grant portfolios for alignment with administration priorities. This dynamic is best understood as a governance and funding-allocation issue rather than a direct assessment of scientific performance. The extent, legal durability, and permanence of these review mechanisms remain uncertain and continue to be shaped by agency practice, litigation, and congressional appropriations decisions.

It is worth noting that these rationales reflect contested empirical and policy judgments. The assumption that private capital will replace public basic science funding has been questioned by multiple economists and industry observers, who note that private investment systematically underweights exploratory research with long, uncertain payoff horizons.¹⁶ The JAMA Health Forum analysis by Cutler and Glaeser estimated that a 43% cut to NIH would produce a social cost approximately 16 times greater than the fiscal savings, primarily through foregone health improvements and delayed medical breakthroughs.⁶

Governance Uncertainty

The governance environment at key agencies has been marked by significant instability. NSF operated for an extended period without a confirmed director; its National Science Board was disbanded.¹⁷ NIH grant-making processes were disrupted by mass terminations, legal challenges, and administrative uncertainty about which categories of research remained eligible for funding. In August 2025, the U.S. Supreme Court issued a 5-4 stay allowing the administration to halt \$783 million in previously-reinstated NIH grants pending appeal—a ruling that further deepened uncertainty for affected researchers and institutions.¹⁸

The federal government shutdown that began in late 2025 added further disruption. NIH and NSF operations were curtailed during the 43-day shutdown period, compressing the window for grant-making in FY 2025. NSF's analysis suggests the agency worked intensively to commit approximately \$8.17 billion in grants by fiscal year-end, roughly matching 2024 levels, though the number of new awards fell by approximately 20% as the agency concentrated funding into fewer, larger grants in anticipation of potential FY 2026 budget reductions.¹⁹

As of early-to-mid 2026, available reporting suggests partial stabilization in some operational areas, including resumed grant processing and appropriations normalization for certain agencies; however, governance structures, funding predictability, and program continuity remain subject to ongoing legal, administrative, and political uncertainty, limiting the extent to which a full recovery can be characterized at this stage.

These governance conditions provide the context for the near-term impacts now visible across grants, institutions, clinical research, and regional economies.

Evidence of Impact — Near-Term (2025–2026)

Grant Terminations: Scale and Pattern

By mid-2025, NIH had terminated approximately 2,200 grants, representing roughly \$1.9 billion in canceled funding as tallied by the Association of American Medical Colleges.²⁰ NSF had terminated 1,752 grants totaling \$1.4 billion as of late May 2025, with the STEM Education Directorate bearing the largest share—839 terminations representing \$888 million, or 65% of terminated funding.²¹

Across both agencies, the pattern of terminations was not random. Research areas targeted included: diversity, equity, and inclusion initiatives; vaccine hesitancy and COVID-19 behavioral research; global health and infectious disease programs; environmental and climate-related studies; social, behavioral, and economic sciences; and disinformation and election security research.^{4, 22, 23} A peer-reviewed study published in *The Lancet Regional Health Americas* found that BIPOC investigators were nearly three times more likely than White male investigators to receive equity-related terminations, and that SGM (sexual and gender minority) investigators were more than 11 times more likely to receive gender-related terminations.²⁴

Institutional Disruption

Academic medical centers and research universities have responded with measurable operational disruptions. Among documented cases: MD Anderson Cancer Center and Baylor College of Medicine (Texas) implemented hiring freezes, with Baylor laying off 122 employees; Johns Hopkins University announced plans to reduce over 2,000 staff positions; Stanford University, Duke University, Emory University, the University of Massachusetts Chan Medical School, and Vanderbilt University Medical Center all implemented hiring freezes or layoffs tied to federal funding uncertainty.^{25, 26} The University of Massachusetts withdrew provisional Ph.D. admission offers to multiple biomedical graduate students to avoid committing to training funding it could no longer reliably project.²⁷

Ninety-one of the NIH-canceled grants—representing \$643 million in funding—had been supporting 113 active clinical trials investigating cancer, HIV, mental health, and COVID-19.²⁰ These trial disruptions represent not only scientific and financial setbacks but also potential human costs, including delayed clinical trials, delayed access to future therapies, reduced public health preparedness, and foregone health improvements of the type emphasized in the JAMA analyses cited in this report.^{6, 32}

Economic Impact Estimates

Multiple independent economic analyses have attempted to quantify the economic cost of the current and proposed funding reductions:

- **SCIMaP (University of Maryland / University of Pennsylvania):** Proposed NIH indirect cost cuts alone would result in an estimated \$16 billion in lost economic activity and 68,000 lost jobs nationwide, distributed across all 50 states and concentrated in university communities.⁵
- **IMPLAN Analysis:** A 15% cap on NIH indirect costs would reduce GDP by \$6.1 billion and eliminate approximately 46,000 jobs, accounting for supply chain and household expenditure multiplier effects.¹³
- **American University (Institute for Macroeconomic and Policy Analysis):** A 25% cut to public R&D spending could depress GDP to levels comparable to the Great Recession; a 50% cut would cost the average American approximately \$10,000.²⁸
- **George Washington University:** Proposed CDC budget cuts would result in the loss of approximately 42,000 jobs nationwide, \$5.4 billion in reduced state GDP, and over \$240 million in lost state and local tax revenues. For every \$1 in federal savings, state and local economies would lose \$1.40.²⁹
- **JAMA Health Forum (Cutler and Glaeser, 2025):** The social cost of the proposed 43% NIH cut—measured primarily in foregone health improvements—would be approximately 16 times larger than the corresponding fiscal savings.⁶
- **United for Medical Research:** Every dollar invested in NIH research generates approximately \$2.56 in new economic activity; in the last decade NIH funding has driven more than \$787 billion in new economic activity and supported an average of more than 370,000 jobs per year.³⁰

Available analyses provide limited direct breakdowns across research stages and domains; however, directional evidence suggests that reductions in federal funding may disproportionately affect early-stage basic research, which relies most heavily on public funding and underpins downstream translational and clinical pipelines. Similarly, biomedical and life sciences research appears particularly exposed relative to fields with more diversified funding sources.^{56,60} These effects may also differ across research types, with early-stage and basic science research typically more sensitive to public funding fluctuations, while later-stage translational and clinical activities may experience lagged but cumulative impacts due to pipeline dependency.

Federal research funding generally does not operate through direct royalty repayment mechanisms to the government. Instead, economic return is typically realized through commercialization activity, productivity gains, healthcare savings, employment growth, tax revenue generation, startup formation, and broader innovation spillovers. The economic analyses cited above suggest that public R&D investment can generate positive returns that extend beyond the original funding recipient and accrue across regional economies, health systems, and innovation-dependent sectors.

Across these analyses, results vary in magnitude but are directionally consistent, suggesting that reductions in federal research funding may produce disproportionately large downstream economic and health impacts. These effects appear to extend beyond immediate budgetary savings, influencing employment, regional economic activity, and the long-term trajectory of innovation-dependent sectors.

While these near-term impacts are visible in grants, employment, clinical trials, and economic activity, the longer-term consequences depend on whether disruption persists long enough to affect the basic science base and future innovation pipeline.

Evidence of Impact — Long-Term (5–20+ Years)

Innovation Pipeline and Basic Science Erosion

The most significant long-term risk may be the erosion of the basic science infrastructure that feeds downstream applied research and commercial innovation. Economists consistently find that public investment in basic research generates returns that are difficult for private actors to capture—and therefore unlikely to be replicated by market forces alone. Recent macroeconomic research suggests that each dollar of non-defense public R&D investment generates between \$1.40 and \$2.10 in economic output, and that government funding has accounted for approximately 20% of U.S. productivity growth since World War II.³¹

Chronic underfunding of basic research in areas such as immunology, neuroscience, infectious disease, bioinformatics, and materials science may diminish the substrate from which future therapeutic modalities—mRNA platforms, gene editing, novel antibiotics, radiopharmaceuticals, quantum-enabled drug modeling—are expected to emerge. The consequence is not readily observable in a single budget cycle; rather, it may manifest as a thinning of the innovation pipeline entering the 2035–2050 horizon.^{1,6}

A JAMA Health Forum systems-analysis paper published in July 2025 mapped the ripple effects of NIH budget cuts across scientific progress, workforce development, healthcare costs, and public health infrastructure, concluding that short-term budget decisions may carry long-term consequences 'some of which may not be recoverable.'³² Macroeconomic modeling by American University found that a 50% cut to research spending would produce GDP losses that 'are going to be a decline forever' rather than a temporary reduction—suggesting the damage is not simply reversible through later reinvestment.²⁸

These dynamics may be particularly relevant to scientific domains such as immunology, bioinformatics, infectious disease, advanced materials, and analytical sciences, where continuity of foundational research supports method development, technical reliability, and reproducible scientific practice across the broader life sciences ecosystem.

The following workforce section examines one mechanism through which these long-term effects may accumulate: changes in the availability, location, and retention of scientific talent.

Strategic Dependence on Foreign Science Hubs

As China, the European Union, and other science-investing nations expand their R&D capacity, there is a plausible risk that the U.S. life sciences and technology sectors become increasingly dependent on external discovery pipelines. Large pharmaceutical companies, which already partner extensively with academic institutions for early-stage discovery, may be compelled to expand R&D footprints in regions with stronger public research ecosystems. The Association of American Universities has characterized the current moment as one where 'China is eclipsing America in its scientific and technological dominance'—occurring at the same time the U.S. is reducing domestic research investments and restricting the inflow of scientific talent through immigration and visa policy.³³

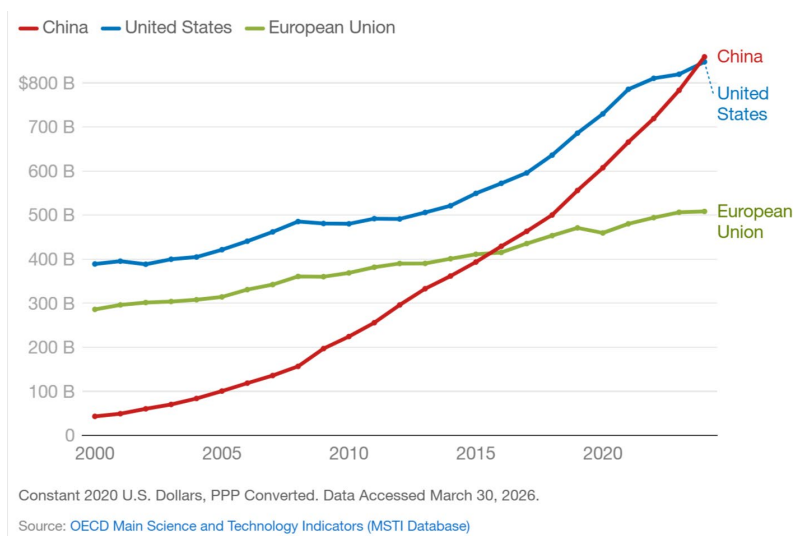


Figure 2. China Surpasses U.S. in R&D Expenditures <https://www.aau.edu/newsroom/leading-research-universities-report/its-official-china-tops-us-rd-spending>

Workforce, Talent, and Brain Drain

Indicators of Outmigration Interest

Survey evidence suggests that a significant share of U.S.-based scientists may be considering international relocation. A 2025 Nature poll of U.S.-based scientists found that approximately 75% of respondents were considering leaving the country, with over 700 postgraduate students among those expressing the intent to depart. Europe and Canada were cited as the most frequently considered destinations.⁹ A separate LinkedIn/media analysis described over 75% of surveyed scientists actively considering leaving.³⁴ It should be noted that survey respondents are self-selecting and these figures may not be representative of the full research workforce; the direction of the signal is, however, consistent across multiple independent data sources.

Observable indicators of actual emigration are emerging. Overseas universities have reported upticks in applications from U.S.-based researchers, and individual cases of senior scientists accepting positions in Europe, Canada, and Australia have been documented in Science and other journals.³⁵ A STAT News report from December 2025 found that while full-scale emigration remained limited, 'some scientists leave U.S. behind,' with factors including visa uncertainty for foreign-born researchers already working in the U.S. adding to the complexity of the dynamic.³⁶

International Recruitment Programs

Multiple countries and institutional coalitions have launched explicit programs to recruit U.S.-based scientists:

- European Union – Choose Europe for Science (CES): An €874 million package (2025–2027) including €500 million in European Research Council Super Grants and new legal protections for academic freedom, announced by Commission President von der Leyen.⁸
- France: A €100 million commitment to incoming researchers, plus Aix-Marseille University's Safe Place for Science initiative.³⁵
- Germany: Max Planck Transatlantic Program established to support migrating U.S. researchers.³⁷
- Spain: ARTRAE Program and Catalonia Talent Bridge.³⁷
- Canada: C\$1.7 billion Global Impact+ Research Talent Initiative, targeting over 1,000 world-leading researchers, announced December 2025.³⁸
- Australia: Global Talent Attraction Program specifically addressing displaced U.S. researchers.³⁷
- Norway: NOK 100 million commitment for international researcher recruitment.³⁷

These programs collectively represent a historically unusual and coordinated international response to the perceived weakening of the U.S. research environment. Their scale, while modest relative to total U.S. federal

research funding, may be sufficient to capture a disproportionate share of elite early-career researchers—the cohort whose long-term productivity shapes a country's scientific output over the following decades.

Several of these recruitment initiatives pair research funding with broader talent-attraction mechanisms, which may include recruitment incentives, expedited residency or immigration pathways, and researcher mobility programs. These mechanisms are intended to attract high-skilled scientific talent, although available reporting does not yet establish their scale, utilization rates, or long-term effectiveness across countries.

Immigration and Visa Barriers

A compounding factor is the tightening of U.S. immigration and visa policy, which may discourage both the inflow of international scientific talent and the continuation of established research collaborations. Science magazine reported in March 2025 that international scientists were increasingly reconsidering U.S. conference attendance due to concerns about customs interrogation, visa delays, and the broader political environment.³⁹ Some scientific societies reported monitoring the situation closely, while at least one Canadian Alzheimer's research group redirected its conference attendance from New York to Toronto in response.³⁹

The U.S. has historically derived significant scientific strength from attracting high-skilled international researchers—from postdoctoral scientists to tenured faculty—who have contributed disproportionately to U.S. patent output, startup formation, and academic publication records. The simultaneous reduction of domestic funding and tightening of talent inflows may create a compounding vulnerability that is more difficult to reverse than either factor alone.

These indicators suggest that workforce dynamics may represent a leading signal of broader systemic change. The combination of funding uncertainty, institutional disruption, and international recruitment activity may contribute to shifts in talent distribution that could influence scientific productivity and leadership over multi-year time horizons.

The workforce effects described above interact with public health capacity because many surveillance, preparedness, and clinical research systems depend on sustained personnel, institutional continuity, and specialized technical infrastructure.

Public Health Infrastructure at Risk

CDC and Preparedness Systems

The proposed 53% reduction in CDC funding—from over \$9 billion in FY 2024 to approximately \$4.5 billion under the administration's FY 2026 request—represents a structural threat to the public health surveillance and emergency preparedness architecture built over decades.⁴⁰ The administration's proposal would eliminate over 100 public health programs and funding lines, including 61 at CDC, targeting cancer and diabetes prevention, global HIV/AIDS programs, global immunization programs, opioid prevention, and infectious disease monitoring.⁴⁰

CDC's Public Health Emergency Preparedness program—the primary source of federal support for state and local emergency preparedness—would face a 52% funding reduction under the FY 2026 proposal.⁴⁰ Approximately 80% of CDC's domestic budget flows directly to states, localities, tribes, and healthcare systems. Federal funding accounts for roughly half of state and local health department budgets; cuts to federal spending therefore directly translate to reduced capacity at the front lines of disease surveillance, outbreak response, and community health.⁴⁰

Congress, as of early 2026, held CDC funding at approximately \$9.2 billion—effectively level with FY 2025. However, the administration separately clawed back over \$12 billion in COVID-era supplemental grants that had been designated for strengthening post-pandemic public health infrastructure, including infectious disease monitoring and laboratory capacity.⁴⁰ This rescission, combined with workforce reductions at CDC and HHS more broadly, may represent a practical reduction in operational capacity that is not fully captured in headline budget figures.

These developments may have broader relevance for global health systems, where continuity of surveillance data, laboratory capacity, and public health infrastructure can influence program effectiveness, quality assurance, and the reliability of evidence used across health systems.

NIH-Funded Clinical Research and Global Health

NIH-funded research programs supporting global health, pandemic preparedness, and infectious disease surveillance have been disproportionately affected by grant terminations. Programs addressing HIV in sub-Saharan Africa, malaria, tuberculosis, and neglected tropical diseases were among those cut in the early 2025 termination waves, creating disruptions to longitudinal studies and public health partnerships that cannot easily be reinstated once discontinued.^{20, 22}

Trust for America's Health (TFAH), in its 2025 annual report, concluded that the combined effects of CDC and HHS workforce reductions and funding clawbacks will 'weaken the nation's public health system and emergency readiness and response' and 'put the country's health and economic security at risk.'⁴⁰ The report called for restoration of federal health agencies, funding, and workforces that were cut in 2025.

These developments suggest that disruptions to funding and workforce capacity may have effects that extend beyond individual programs, potentially influencing the resilience of public health systems more broadly. Reductions in continuity across surveillance, preparedness, and global health initiatives may affect both immediate response capabilities and longer-term system performance.

These public health effects intersect with international competition because reductions in domestic capacity may occur while other countries are increasing investment, recruiting researchers, and expanding scientific infrastructure.

International Competitive Landscape

China: Sustained Strategic Investment

China's total R&D investment exceeded 3.92 trillion yuan (approximately \$569 billion) in 2025, representing 2.8% of GDP—a milestone of particular significance because basic research funding crossed the 7% threshold of total R&D spending for the first time.⁷ China's R&D expenditure has grown at least 8% annually for the past five years. At its 2026 Two Sessions legislative meeting, the Chinese government proposed increasing the central science and technology budget to 426 billion yuan—a 10% increase from 2025—and committed to sustaining at least 7% annual nationwide R&D growth through 2030.^{7, 41}

Multiple forecasting analyses suggest China may match or exceed U.S. total R&D spending by 2026 in nominal terms, with a larger purchasing-power advantage already established.⁴² The Association of American Universities described the current trajectory as a case where 'in the competition with China, it is now our race to lose.'³³ China is simultaneously expanding its talent pipeline through domestic training programs, aggressive international recruitment, and expanded publication output across disciplines including biotech, AI, advanced materials, and quantum science.

These shifts may influence international scientific and regulatory engagement, particularly in regions where expanding research ecosystems could affect adoption pathways, collaboration priorities, and the geographic distribution of scientific influence across life sciences and public health domains.

European Union and UK: Contrasting Trajectories

The European Union has positioned itself as the primary beneficiary of U.S. scientific disruption, combining the Choose Europe for Science program with its flagship €93.5 billion Horizon Europe research and innovation framework.⁸ The EU's response may be understood as both a humanitarian gesture to displaced researchers and a deliberate strategic investment in long-term scientific competitiveness—an acknowledgment that elite scientific talent, once relocated, tends to generate durable institutional and economic advantages for the receiving nation.

The United Kingdom presents an instructive cautionary parallel. Post-Brexit disruption of UK-EU research relationships has produced measurable negative effects on UK higher education and STEM research: reduced collaboration networks, diminished access to Horizon Europe funding, weakening of the broader innovation ecosystem, and uncertainty-driven emigration of researchers.⁴³ UK efforts to rebuild through domestic replacement programs and partial Horizon re-association have been slow. The UK experience suggests that when a major science system loses access to a large supranational or national funding base, the rebuilding process is protracted and rarely fully recovers to baseline.⁴³

Scenario Analysis: Four Trajectories

Scenario	Description	Indicators to Watch
A: Sustained Deep Cuts	Federal basic and health research budgets shrink 20–40% for a decade; overhead caps persist. Academic labs downsize; early-career researchers exit or emigrate. China, EU consolidate global leadership.	Congressional budget votes; state-level science investment; researcher emigration rates
B: Partial Rollback and Reprioritization	Political and industry pushback yields partial NIH/NSF restoration with more mission-oriented constraints (oncology, pandemic readiness, AI). ARPA-H and targeted public-private mechanisms co-finance priority areas.	FY2027 appropriations; ARPA-H budget trajectory; industry-government partnership announcements
C: Counter-Cyclical Private and State Surge	U.S. states, large philanthropies, and corporate consortia create regional science funds. Private capital compensates selectively for federal retrenchment in commercially attractive platforms.	Foundation payout rates; state research bond initiatives; VC flows to early-stage platforms
D: Strategic Reinvestment (Sputnik Moment)	China's R&D leadership and visible tech advances catalyze bipartisan reinvestment. Federal R&D intensity (% GDP) begins recovering from ~0.7% toward historical highs.	Bipartisan science legislation; public polling on scientific competitiveness; geopolitical events

Table 2. Scenario framework for U.S. federal science funding trajectories. Scenarios developed from source analysis; not attributable to any single institution.

These trends suggest a potential rebalancing of global scientific capacity, in which changes in U.S. funding and policy interact with sustained international investment and talent recruitment. The resulting shifts may influence where scientific discovery occurs, as well as how research systems are organized and interconnected over time.

The scenario framework provides a reference for monitoring policy trajectories, funding signals, and changes in the organization of research systems. It also helps distinguish observed impacts from possible future outcomes under different funding and governance conditions.

Alternative and Emerging Funding Pathways

Because federal funding remains central to U.S. research capacity, alternative funding pathways are best assessed in terms of their scale, scope, and ability to preserve continuity rather than as direct substitutes for public investment.

Private Philanthropy

Private philanthropic foundations have responded to the federal funding disruption with measurable increases in grant-making, though multiple analyses suggest the scale of the philanthropic response cannot close the gap created by federal retrenchment. The Science Philanthropy Alliance estimates that philanthropic funding contributed \$27 billion to university and non-profit research in 2024, compared to \$63.6 billion from the federal government—a ratio that illustrates the structural limits of philanthropic substitution.¹⁴

The MacArthur Foundation raised its charitable payout target from 5.25% to a floor of 6% for 2025 and 2026, generating approximately \$150 million in additional giving.⁴⁴ Multiple other major foundations—including the Gates Foundation, Stupski Foundation, and McClatchy Foundation—have announced plans to accelerate or spend down endowments. By April 2026, approximately 30% of private foundations had increased payouts beyond planned levels, 64% had introduced emergency funding mechanisms, and unrestricted grant-making had increased 42%.⁴⁵

However, as the Robert Wood Johnson Foundation's chief science officer observed, these responses resemble emergency triage rather than structural replacement: 'it felt like I was back in my old public-health director role of emergency response.'¹⁴ Private philanthropy provided approximately \$16.7 billion for science in 2022; the proposed federal cuts across major science agencies total approximately \$30.5 billion—a gap that existing philanthropic capacity cannot plausibly fill.⁴⁴ Moreover, philanthropic funding tends to flow toward named diseases, high-profile platforms, and geographically concentrated institutions, leaving basic science, regional universities, and lower-profile research areas underserved.

ARPA-H and Mission-Oriented Vehicles

The Advanced Research Projects Agency for Health (ARPA-H) was funded at \$1.5 billion for FY 2026 following congressional preservation of the agency, which the administration had proposed to cut to \$945 million.⁴⁶ A coalition of more than 120 organizations has called for at least \$1.7 billion for ARPA-H in FY 2027.⁴⁷ ARPA-H represents one potentially resilient vehicle for mission-oriented health research funding, but its scope—focused on high-risk, high-reward health technology challenges—is distinct from, and cannot substitute for, the broad-based basic research infrastructure funded by NIH and NSF.

Precompetitive Industry Consortia

Industry has shown limited but directionally positive movement toward precompetitive co-investment models, particularly in areas with clear commercial adjacency—including antimicrobial resistance, oncology biomarkers, and AI-enabled drug discovery platforms. Venture capital has historically avoided early-stage

basic science due to return horizon mismatches, and there is no clear evidence of VC flows shifting materially toward the categories of research most exposed by federal cuts. Private companies exploring gap-filling roles have been characterized by health policy experts as having 'puny' budgets relative to the scale of federal funding they would need to replace.⁴⁶

High-profile private-sector investments, including large AI and research infrastructure initiatives, demonstrate continued private interest in innovation capacity. However, these investments are generally concentrated in specific technology domains, platform objectives, or commercial infrastructure needs. They may complement selected areas of the research ecosystem but should not be interpreted as direct substitutes for broad federal support of basic and publicly funded research.

State and International Co-Funding

Several U.S. states with established biomedical clusters—Massachusetts, California, Maryland, and others—have indicated interest in state-level science investment to offset federal reductions, though legislative action remains limited as of mid-2026. The UK's Horizon Europe re-association and Canada's access to select Horizon Europe calls illustrate one model for international co-funding that U.S. institutions may explore in modified forms.⁴⁸

Overall, these developments suggest that while alternative funding mechanisms may play an increasingly important role, they are unlikely to fully replicate the scale or coordination of federal research support. The emerging landscape may therefore be characterized by greater fragmentation and variability in funding sources, with implications for research continuity and system-level coherence.

Beyond funding mechanisms, the broader environment for science also depends on public trust, institutional credibility, and the continued movement of researchers, data, and ideas across borders.

Trust in Science and Scientific Exchange

Public Trust Signals

The relationship between funding policy and public trust in science is multidirectional and difficult to disentangle. Pew Research Center's 2025 survey found that overall trust in science increased slightly from 76% in 2024 to 77% in 2025, and that scientists remained the most trusted profession among those surveyed.⁴⁹ However, the partisan divide in trusting science has persisted and, in some dimensions, widened: the proportion of Americans reporting high trust in scientists declined from 58% in 2020 to 36% in 2025, with sharper drops among Republicans (54% to 26%) than Democrats (67% to 50%), according to a separate survey.⁴⁹ Nearly two-thirds of Democrats felt the U.S. is losing ground on scientific achievement, while only one-third of Republicans shared that concern.⁴⁹

These findings suggest that public support for government investment in science remains broadly present—Pew found 'Americans across the board want the country to be a scientific leader'—but that this support may

be increasingly stratified along political lines in ways that complicate the political economy of sustained federal investment.⁴⁹

Scientific Exchange and International Collaboration

Parallel to domestic funding reductions, U.S.-China scientific collaboration has encountered growing institutional friction. Congressional oversight activity in 2026 focused on Science and Technology Agreements (STAs) between U.S. federal agencies and the Chinese government, citing concerns about IP theft and exploitation of cooperative arrangements.⁵¹ Export controls have intensified, and restrictions on the movement of researchers between the two countries have grown in both directions. AAAS and ResearchAmerica, among others, have flagged the cumulative effect of declining trust in U.S. institutions, deteriorating funding stability, and tightening immigration policy as creating a mutually reinforcing erosion of the conditions that historically made the U.S. a magnet for global scientific talent and collaboration.¹⁷

Conference participation by international scientists in U.S.-hosted events may be declining at the margins, as researchers from some countries report heightened anxiety about border crossings and customs encounters. Some scientific societies have begun contingency planning for international meeting venues in response.³⁹ The long-term significance of these trends is directionally negative for the open exchange of scientific ideas that has historically been one of the structural advantages of U.S.-hosted science.

The following strategic implications synthesize these research findings for executive audiences while preserving the distinction between evidence-based observations and possible organizational considerations.

Strategic Implications and Considerations

The following observations are offered as directional strategic considerations for professional and executive audiences engaged with life sciences, public health, standards, and research-adjacent sectors. These are framed as possibilities and considerations rather than directives, consistent with the analytical posture of this document.

- **Portfolio exposure.** Organizations with significant dependency on NIH, NSF, CDC, or DOE funding—directly or through academic and CRO partners—may face different levels of exposure under the scenario range described above. Both deep sustained cuts and partial rollback with reprioritization imply possible restructuring of the research funding landscape over the next 3–5 years.
- **Alternative funding architecture.** Philanthropic emergency funding, ARPA-H, state-level initiatives, and selected private-sector investments suggest a more fragmented, multi-sourced funding landscape. Mixed funding portfolios may reduce single-funder concentration risk, but available evidence does not indicate that these mechanisms can replace broad federal support at scale.
- **Talent distribution.** Early-career researchers appear especially exposed to funding uncertainty and international recruitment activity. Stable research environments, clear mandates, and cross-border mobility options may influence where mobile scientific talent chooses to locate over time.

- **International R&D positioning.** China's R&D growth and EU recruitment programs point to a possible realignment of global scientific capacity. For organizations with discovery, translational, or regulatory science dependencies, the location of research partners and infrastructure may become a more strategically important variable.
- **Public health infrastructure and technical dependencies.** Reductions in CDC, NIH, and global health programs may affect surveillance data, laboratory capacity, reference materials, and methodological resources that support life sciences, diagnostics, and regulatory ecosystems. The scale and timing of these effects remain uncertain and may vary by disease area, geography, and research domain.
- **Legislative trajectory.** FY 2026 appropriations largely moderated the proposed cuts, but the FY 2027 budget cycle will be an important indicator of whether administrative-level strategies intensify and whether bipartisan legislative resistance to deeper cuts is maintained.

Stakeholder Landscape

Stakeholder Category	Key Actors	Current Posture
Federal Agencies	NIH, NSF, CDC, FDA, DOE-SC, DOD R&D	Variable; some facing deep proposed cuts, others relatively stable (defense-aligned). Governance instability at NSF and NIH.
Academic Medical Centers & Research Universities	Johns Hopkins, Harvard, Stanford, Duke, MD Anderson, Baylor, regional AMCs	Widespread hiring freezes, layoffs, clinical trial disruptions, graduate program contractions.
Biopharmaceutical and Medtech Industry	Large-cap pharma, medtech, diagnostics, CROs/CDMOs	Dependent on academic ecosystem for discovery; exploring gap-fill but limited appetite for early-stage basic science.
Philanthropic Foundations	Gates, Wellcome, MacArthur, Robert Wood Johnson, Schmidt Family	Increasing payouts; emergency mechanisms; sector-wide insufficient to replace federal scale.
Patient Advocacy and Disease Organizations	Cancer, neurodegenerative, rare disease, global health advocacy groups	Active advocacy for restoration; influencing Congressional appropriations through constituent pressure.
International Governments / Institutions	EU, France, Germany, Canada, Australia, Norway	Active recruitment of U.S. researchers; expanding domestic R&D investment; positioning as alternative hubs.
China	MOST, Chinese Academy of Sciences, Chinese universities	Sustained 7–8%+ annual R&D growth; expanding publication and patent output; talent pipeline expansion.
Scientific Professional Societies	AAAS, ACS, AAU, AAMC, APA, AABB, ResearchAmerica	Active advocacy; lobbying Congress; issuing public statements; some relocating conferences.

Table 3. Stakeholder landscape. Characterizations are directional and based on publicly available statements and reporting as of June 2026.

Gaps, Uncertainties, and Open Questions

Several areas of genuine uncertainty limit the precision of conclusions in this scan:

- **Actual vs. proposed funding levels:** The FY 2026 appropriations cycle largely rejected the deepest proposed cuts; the FY 2027 proposals are not yet available. The gap between administrative proposals and enacted budgets has been large, and the pattern may or may not persist.

- **Actual emigration rates:** Survey data on scientists considering leaving the U.S. does not yet have a clear translation into actual migration flows. Longitudinal tracking of researcher destination choices, publication affiliations, and grant recipients' institutional addresses would provide more definitive evidence.
- **Composition of scientist migration:** Available reporting does not consistently distinguish between U.S.-born scientists relocating abroad and foreign-born scientists returning to countries of origin or moving to third countries. Additional longitudinal workforce data would be required to determine migration patterns, retention dynamics, and destination choices more precisely.
- **Private sector substitution capacity:** Directional evidence suggests that private funding cannot substitute for federal basic research at scale, but the degree and pace of private-sector adaptation to the new environment is not yet fully observable.
- **Administrative vs. legislative pathways:** The interaction between administrative grant terminations, indirect cost policy, and congressional appropriations creates a complex and rapidly evolving picture in which headline budget figures may not fully capture the operational reality facing research institutions.
- **Regional heterogeneity:** The economic and scientific impact of funding reductions is highly concentrated in specific geographies—states with large academic medical centers and biomedical clusters. National aggregate statistics may mask significant local variation.
- **Long-run dynamic effects:** The most serious consequences of sustained underfunding—reduced innovation capacity, thinning of the translational pipeline, loss of scientific preeminence—will not be observable for 10–20 years and cannot be fully quantified in current models.

Conclusions

Federal research funding uncertainty has emerged as more than a budgetary issue. The combination of proposed funding reductions, administrative grant actions, workforce disruption, public-health capacity constraints, and increasing international competition suggests a broader period of transition within the U.S. research ecosystem. While the ultimate trajectory remains uncertain, available evidence indicates that changes in research funding structures can have effects that extend well beyond the scientific community, influencing innovation capacity, talent availability, economic activity, public-health preparedness, and long-term competitiveness.

The most significant near-term impacts are already visible through grant terminations, hiring freezes, workforce uncertainty, delayed clinical research activity, and growing international recruitment efforts targeting U.S.-based researchers. Longer-term outcomes will depend largely on future policy decisions, funding stability, and the ability of public, private, and philanthropic organizations to sustain critical scientific infrastructure.

Regardless of which future scenario emerges, organizations that depend on research, innovation, regulatory science, advanced technology development, healthcare, standards, or scientific talent may benefit from monitoring changes in funding priorities, talent flows, partnership structures, and global research capacity. These indicators may provide early signals of broader shifts that could influence strategic planning, investment decisions, and organizational resilience over the coming decade.

SCOPE NOTE

This scan separates proposed reductions from enacted appropriations throughout. Where a figure is a budget request rather than an appropriation, it is labelled as such. Scenario characterisations are directional, developed from source analysis, and not attributable to any single institution.

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