

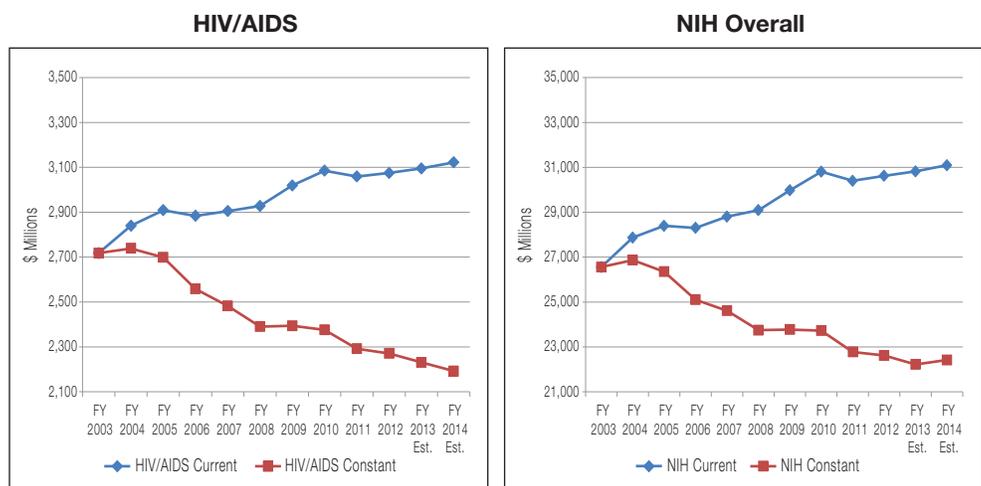
# The Costs of Flat Funding for Biomedical Research

Biomedical research saves lives, generates economic benefits, and yields scientific insights that catalyze future medical breakthroughs. Although the U.S. has long been recognized as the world leader in biomedical research, stagnant funding (which translates into actual funding reductions when adjusted for inflation) imperils U.S. leadership and jeopardizes future life-saving research advances.

## Funding for Biomedical Research Is Declining

- Biomedical Research Funding Has Been Slashed in Real Terms:** From 2003 to 2012, U.S. investment in National Institutes of Health (NIH) research remained flat, resulting in a 22 percent decline in purchasing power in a single decade.<sup>1,2</sup>
- The Sequester Has Further Undermined Biomedical Research:** The federal budget sequester, which went into effect March 1, 2013, resulted in an additional 10 percent cut to existing grants<sup>3</sup> and an inability to fund 700 research projects already deemed worthy of support.<sup>4</sup>
- The Public Is Increasingly Concerned:** According to poll results released in 2013, 85 percent of Americans say they are concerned about stagnant funding for biomedical research.<sup>5</sup>

### The Declining Buying Power of Biomedical Research Funding (FY2003–2014)



Funding for HIV/AIDS and overall NIH biomedical research, FY2003–FY2014 (estimated), in current and constant (inflation-adjusted) dollars. The red lines show funding in constant 2003 dollars, and demonstrate a progressive loss in purchasing power for HIV/AIDS and overall biomedical research financing. (Source: Office of AIDS Research, National Institute of Health)

## Funding Cuts Are Jeopardizing America's Global Leadership in Biomedical Research

- Fewer Meritorious Research Avenues Pursued:** As the NIH's purchasing power has sharply declined, fewer research proposals are being funded. Whereas 34 percent of all research proposals to the NIH were approved for funding in 1999, only 19 percent were approved in 2012.<sup>6,7</sup> Among applicants for cancer research projects, only one in eight

(12 percent) will be approved for funding as a result of budget limitations.<sup>4</sup> At the National Institute of Allergy and Infectious Diseases, the odds that a deserving research application will be approved have fallen by more than half since 2003.<sup>9</sup>

- **Fewer Opportunities for Young Scientists:** As a result of funding cuts, young researchers are being shut out of the world of NIH-funded research, undermining their ability to

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advance in their respective fields. While 18 percent of NIH-supported Principal Investigators in 1983 were under age 36, only about three percent were under 36 in 2010.<sup>9</sup>

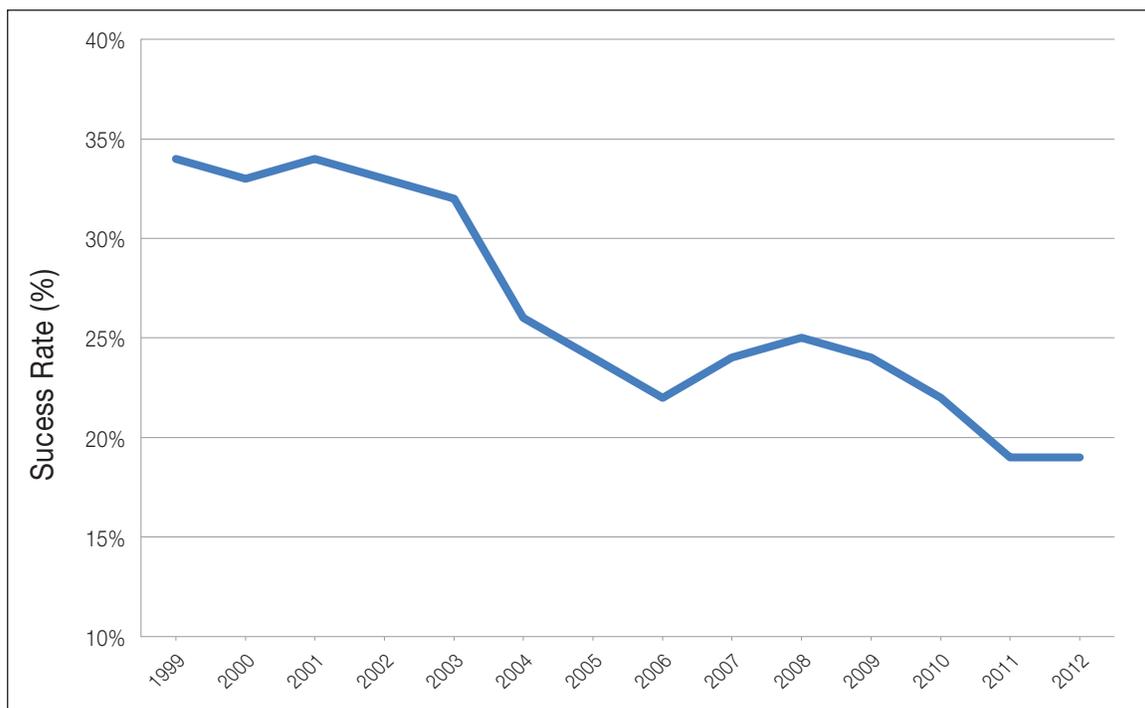
- **America's Leadership Role Is Under Threat:** The U.S. share of global biomedical research spending has fallen

from 38 percent in 1999 to 31 percent in 2009.<sup>10</sup> As funding declines, the U.S. is less likely to be the home for future biomedical research breakthroughs. Given the need for the pharmaceutical and biotechnology industries to draw from the very best scientific minds and the latest research findings, America's disinvestment in biomedical research could prompt major companies to relocate to China, India, or other places that prioritize research investments.<sup>1</sup>

### Funding Cuts to Biomedical Research Cost Lives

- **American-Led Biomedical Research Breakthroughs Save Millions of Lives Each Year:** In large part due to biomedical advances, American life expectancy has increased by one year every six years since 1990.<sup>11</sup> The U.S.-led development of antiretroviral therapy has saved 14 million life-years since 1995,<sup>12</sup> mortality rates for childhood cancer have fallen 68 percent in the last four decades,<sup>13</sup> 12 million cancer patients in the U.S. are alive today as a result of research advances,<sup>14</sup> death rates for heart disease declined by 65 percent from 1968 to 2006,<sup>15</sup>

Percentage of Proposed Research Projects Approved for Funding by the NIH 1999–2012



and preventive vaccines save the lives of three million children each year.<sup>16</sup> As a result of NIH-funded research, the cure rate for childhood leukemia has reached 90 percent, 11 new cancer drugs were approved in the last year, and an effective vaccine is now available to prevent cervical cancer, a disease that kills 4,000 American women each year.<sup>17</sup>

- **Funding Cuts Will Impede Exploration of Potential New Breakthroughs:** Mapping of the human genome has opened up historic opportunities to explore gene-based treatments for the world's most serious and vexing diseases, but limited funding will inevitably delay (and in some cases prevent altogether) exploration of potentially transformative new approaches to leading causes of death and disability.<sup>1</sup> Funding limitations will also hamper abilities to pursue other promising research prospects,

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including gene therapies for cancer,<sup>18</sup> a cure for HIV,<sup>19</sup> a universal flu vaccine that protects against all possible influenza strains,<sup>20</sup> and autologous stem cell transplantation to reduce mortality following a heart attack.<sup>21</sup> Research funding cuts will also inevitably hinder efforts to develop treatments and preventive regimens for the rapidly growing challenge posed by Alzheimer's disease, the costs of which are projected to rise to \$1.1 trillion by 2050 unless new therapeutic approaches are developed.<sup>22</sup>

### Reduced Funding for Biomedical Research Hurts the Economy and Costs Jobs

- **Biomedical Research Investments Spur Economic Growth and Create Jobs:** The life sciences field is responsible for more than seven million jobs in the U.S. and adds \$69 billion annually to the gross domestic product.<sup>10</sup> Every dollar invested in the NIH results in \$2.21 in local economic growth.<sup>23</sup> With a \$3.8 billion investment, the Human Genome Project alone generated an estimated \$796 billion in economic growth between 2000 and 2010—a 141-fold return on investment.<sup>24</sup> As academic research centers and related industries around the country have recently realized, cuts in biomedical research funding resulting from sequestration, cause many talented scientific professionals to lose their jobs.

- **American Disinvestment in Biomedical Research Damages Our Long-Term Competitiveness:** As a result of its substantial investments in biomedical research, China's share of the global pharmaceutical industry output rose seven-fold between 1995 and 2010—increasing from 2.5 percent to 18.3 percent—while the American share held steady at around 26–27 percent.<sup>10</sup> Unless America reinvests in biomedical research, China could soon overtake the U.S. as the global leader in the development of breakthrough medical discoveries.
- **Biomedical Research Contributes to Increased Productivity:** In addition to the direct economic benefits of biomedical research, the improved treatments resulting from these investments keep American workers healthy and productive. It is estimated that the U.S. reaped \$95 trillion in economic benefits from increases in life expectancy between 1970 and 2000.<sup>11</sup> Reduced mortality from heart disease and stroke yields an estimated economic return of \$2.5 trillion a year.<sup>1</sup> Cuts to biomedical research from budget sequestration alone are projected to reduce GDP by \$200 billion over the next several years.<sup>25</sup>

### Conclusion

Flat funding for the NIH over the last decade equates to a substantial decline in U.S. investment in biomedical research when adjusted for inflation, eroding America's longstanding position as the preeminent driver of medical innovation and discovery. Reduced purchasing power at the NIH results in fewer opportunities for talented young

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scientists, impedes exploration of new approaches to preventing, treating and curing life-threatening diseases and conditions, and ripples out across multiple sectors of the U.S. economy. Continued disinvestment in the NIH will seriously undermine America's long-term competitiveness and could lead to the U.S. relinquishing its global leadership in biomedical research.

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