

# NIH Appropriations & Grant Trends

FY 1995-2018

Produced by FASEB Office of Public Affairs



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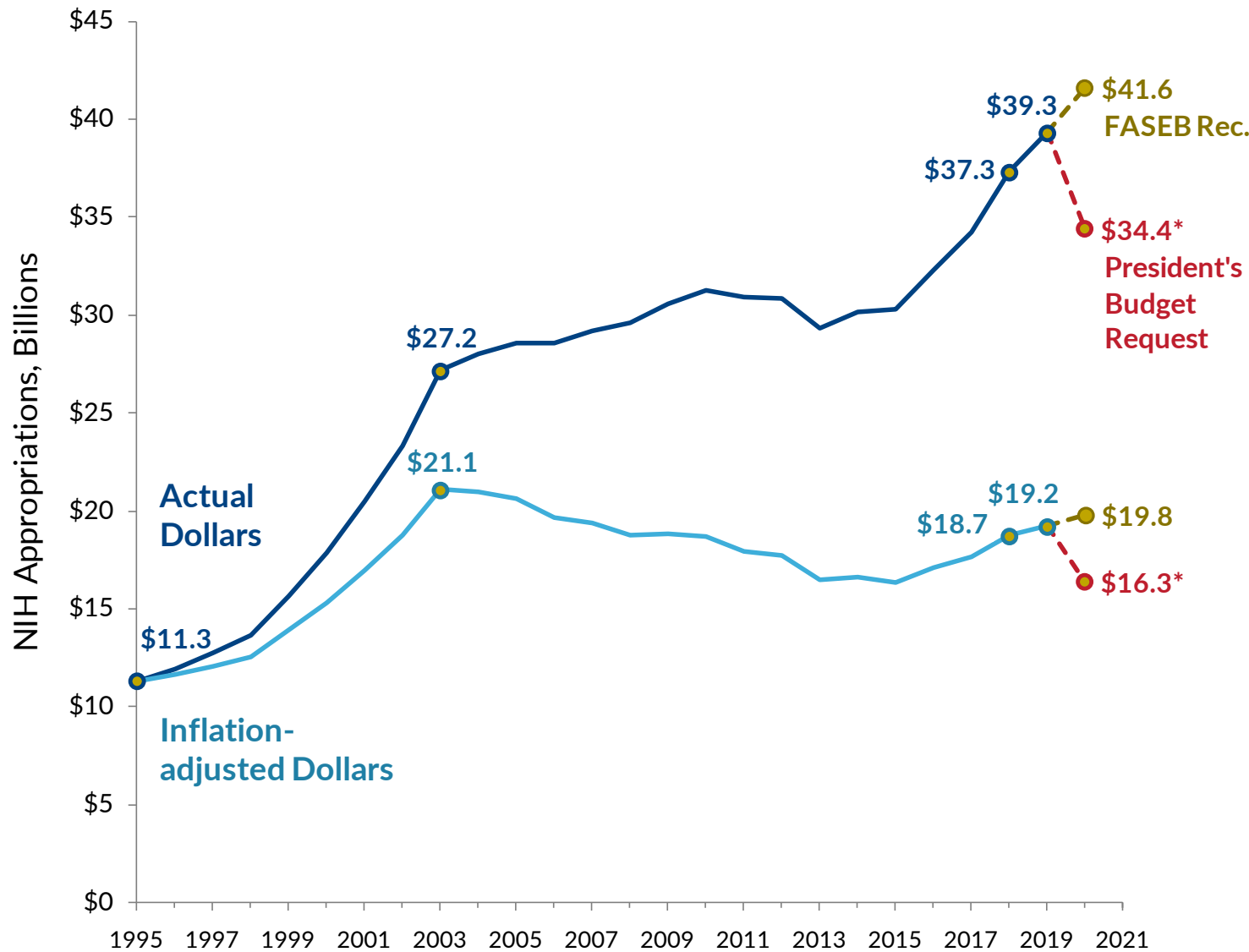
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# NIH Appropriations

- Budget: 1995-Present
- By Era with Annual Growth Rates
- Compared to the National Debt
- How Increases Are Spent

*Next section: NIH Grants →*

# NIH Appropriations, 1995-Present



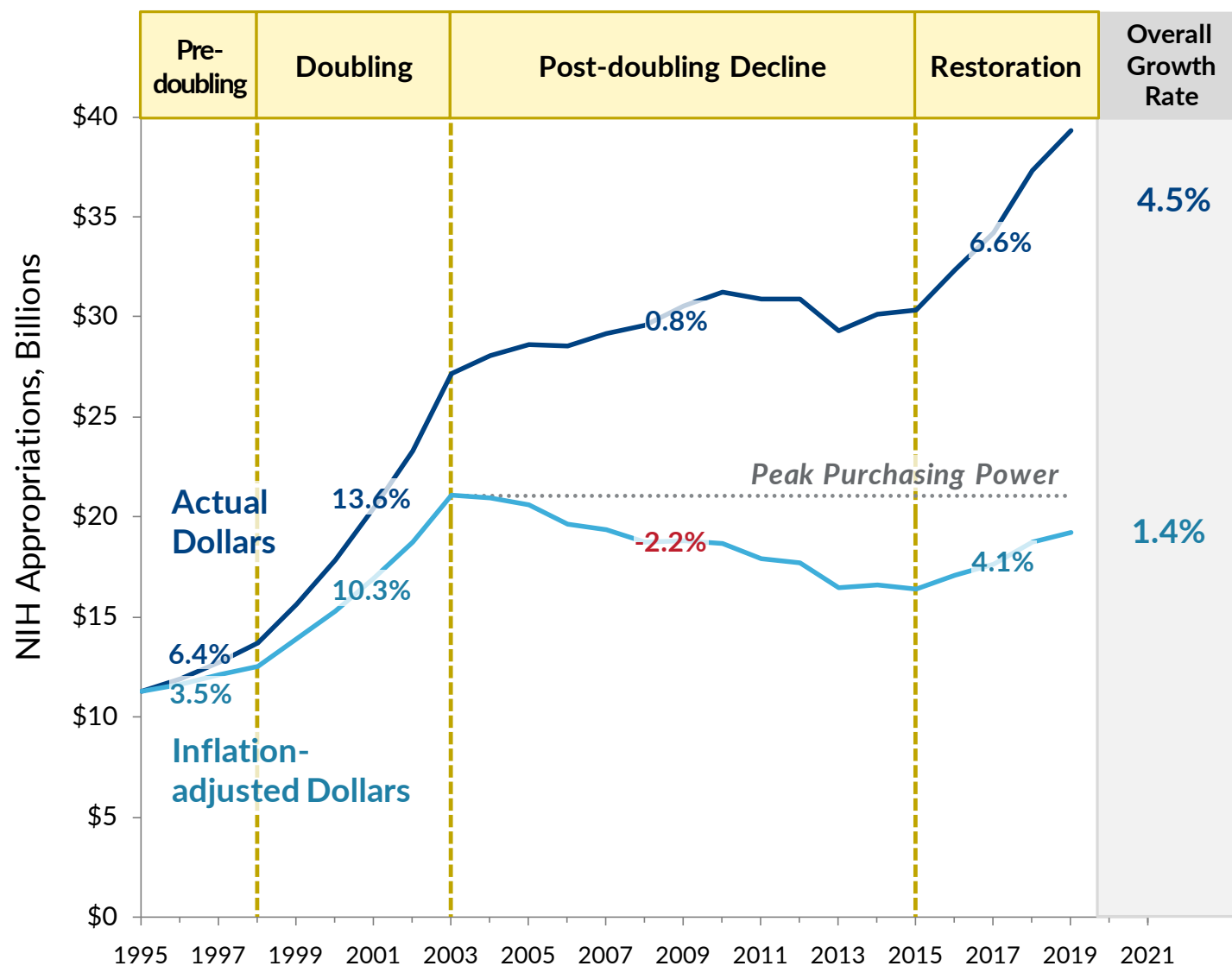
- The FY 2019 NIH budget is \$39.3 billion (+ \$2 billion)
  - 5.4% increase
  - 2.5% inflation-adjusted increase
- President's FY 2020 Budget Request: \$34.4 billion,\* an effective **cut of 15%** after adjusting for inflation
- FASEB's FY 2020 Recommendation: At least \$41.6 billion
  - 5.8% increase
  - 2.9% inflation-adjusted increase

\* Includes the transfer of the Agency for Healthcare Research and Quality (AHRQ) and its proposed budget of \$256 million to NIH

Appropriations data track total programmatic level funding, including Superfund activities and PHS evaluation funds. Inflation-adjusted (constant) dollars were calculated using the Biomedical Research and Development Price Index (BRDPI).

Sources: NIH Office of Budget, [Appropriations History](#), [Price Indexes](#), and [Budget Request](#)  
 FASEB [Annual Federal Funding Recommendations](#)

# NIH Appropriations, by Era with Annual Growth Rates



- NIH appropriations can be divided into four major eras
- **Pre-doubling:** Before FY 1999, the NIH budget grew at a fairly stable rate after accounting for inflation
- **Doubling:** Over a five year period, Congress doubled the NIH budget
- **Post-doubling Decline:** NIH lost 22% of its capacity to support research due to budget cuts and inflationary losses
- **Restoration:** Through annual increases of \$2-3 billion, growth rates are now comparable to the Pre-doubling era. However, NIH's purchasing power remains below its peak

Appropriations data track total programmatic level funding. Inflation-adjusted (constant) dollars were calculated using BRDPI. Annual growth rates were established using the fitted average growth rate (FAGR) method.

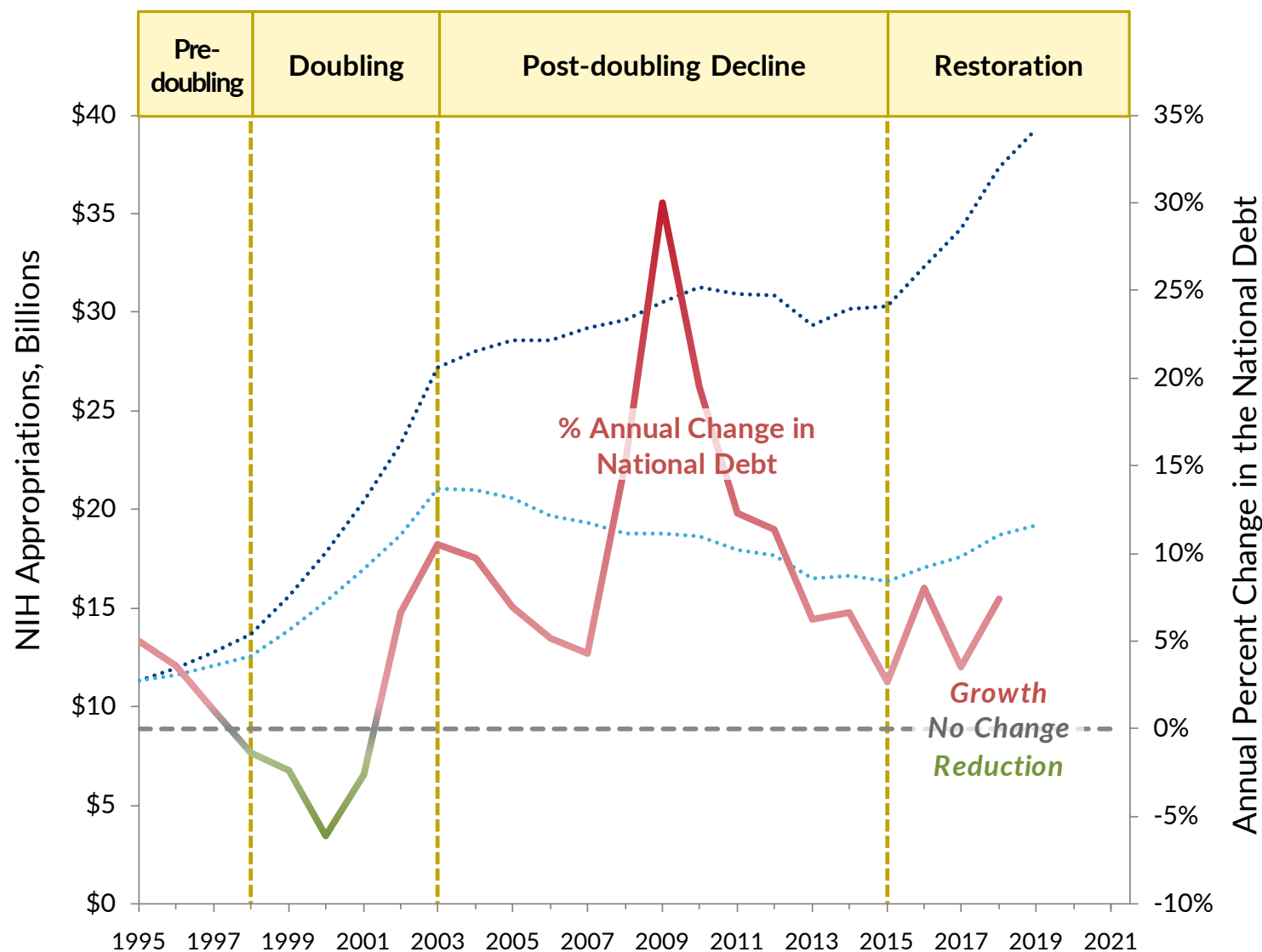
Sources: NIH Office of the Director, Office of Budget, [Appropriations History](#) and [Price Indexes](#)



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# NIH Appropriations, Compared to the National Debt



- The major NIH budget eras correlate with changes in the size of the National Debt
  - When the National Debt shrank due to budget surpluses (FY 1998-2001), the NIH budget was doubled
  - However, when the National Debt grew rapidly during the Great Recession, NIH's purchasing power shrank
- Broader fiscal issues significantly impact the federal investment in biomedical research

Appropriations data track total programmatic level funding. Inflation-adjusted (constant) dollars were calculated BRDPI. The annual change in the National Debt was calculated from the data series "Debt Held by the Public," which reflects the value at the end of the fiscal year.

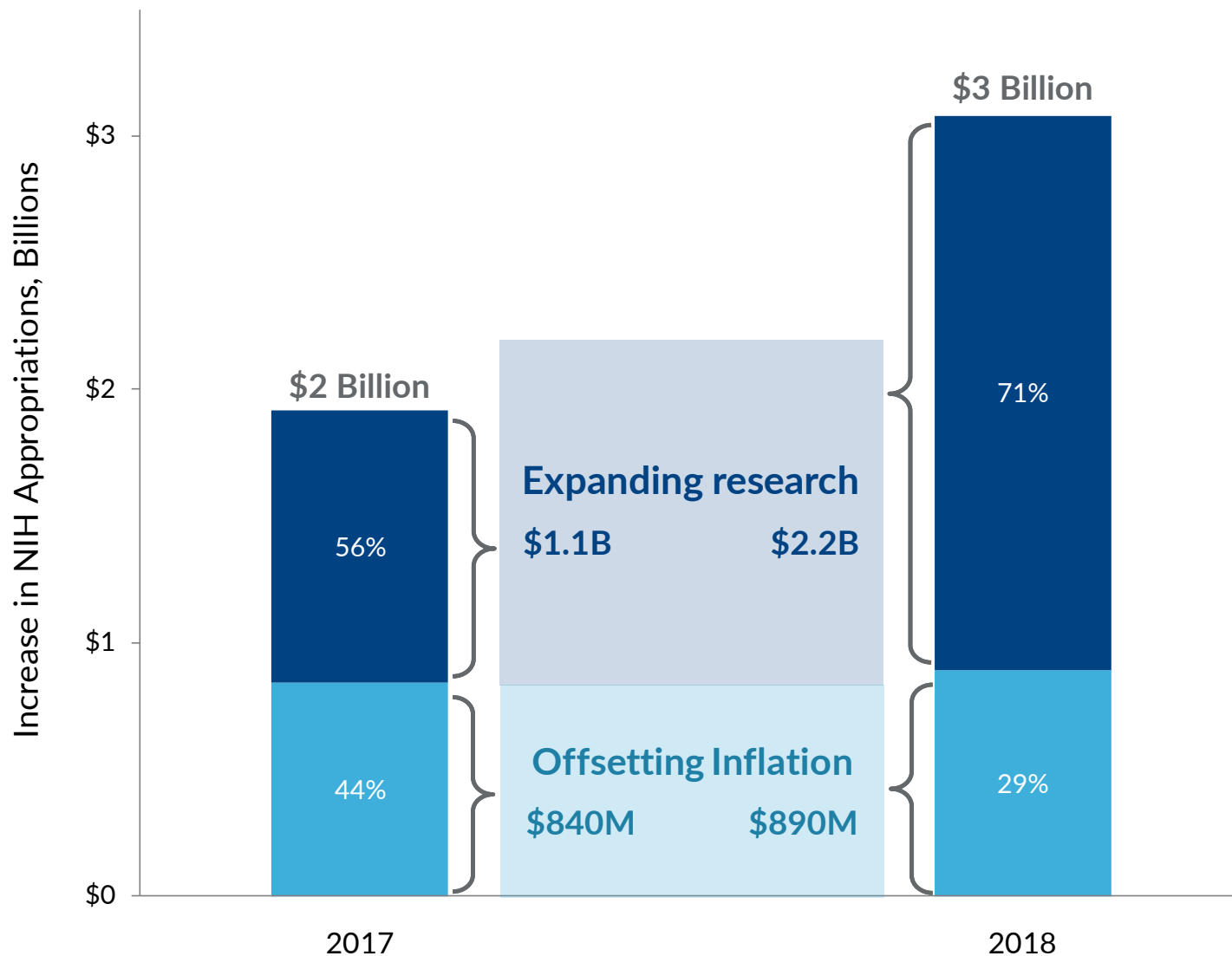
Sources: NIH Office of Budget, [Appropriations History](#) and [Price Indexes](#)  
 Congressional Budget Office, [Historical Budget Data](#)



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# NIH Appropriations, How Increases Are Spent



Recent increases have helped maintain and grow research capacity by:

- **Offsetting inflation:**  
~\$1 billion is needed annually to replace inflationary losses (assuming rates of 2-3%)
- **Expanding Research:**  
Budget increases enable NIH to award more Research Project Grants,
  - 1,149 more in FY 2017\*
  - 2,415 more in FY 2018\*
 fund more trainee positions (F-awards),
  - 99 more in FY 2017\*
  - 172 more in FY 2018\*
 and continue support for other research programs and infrastructure

\*Based on the number of awards/positions planned under a CR compared with the number actually funded.

The NIH Congressional Justification for the President's Budget Request includes a mechanism table for the prior, current, and requested fiscal years. Because NIH was operating under a continuing resolution (CR) in FY 2017 and 2018, the mechanism table estimated the number of awards that could be made if the budget remained flat. By comparing these projections with the number of grants ultimately awarded, one can estimate the impact of budget increases.

Sources: NIH Office of Budget, [Appropriations History](#), [Price Indexes](#), and [Historical Budget Requests](#); NIH RePORT [Data Book](#)



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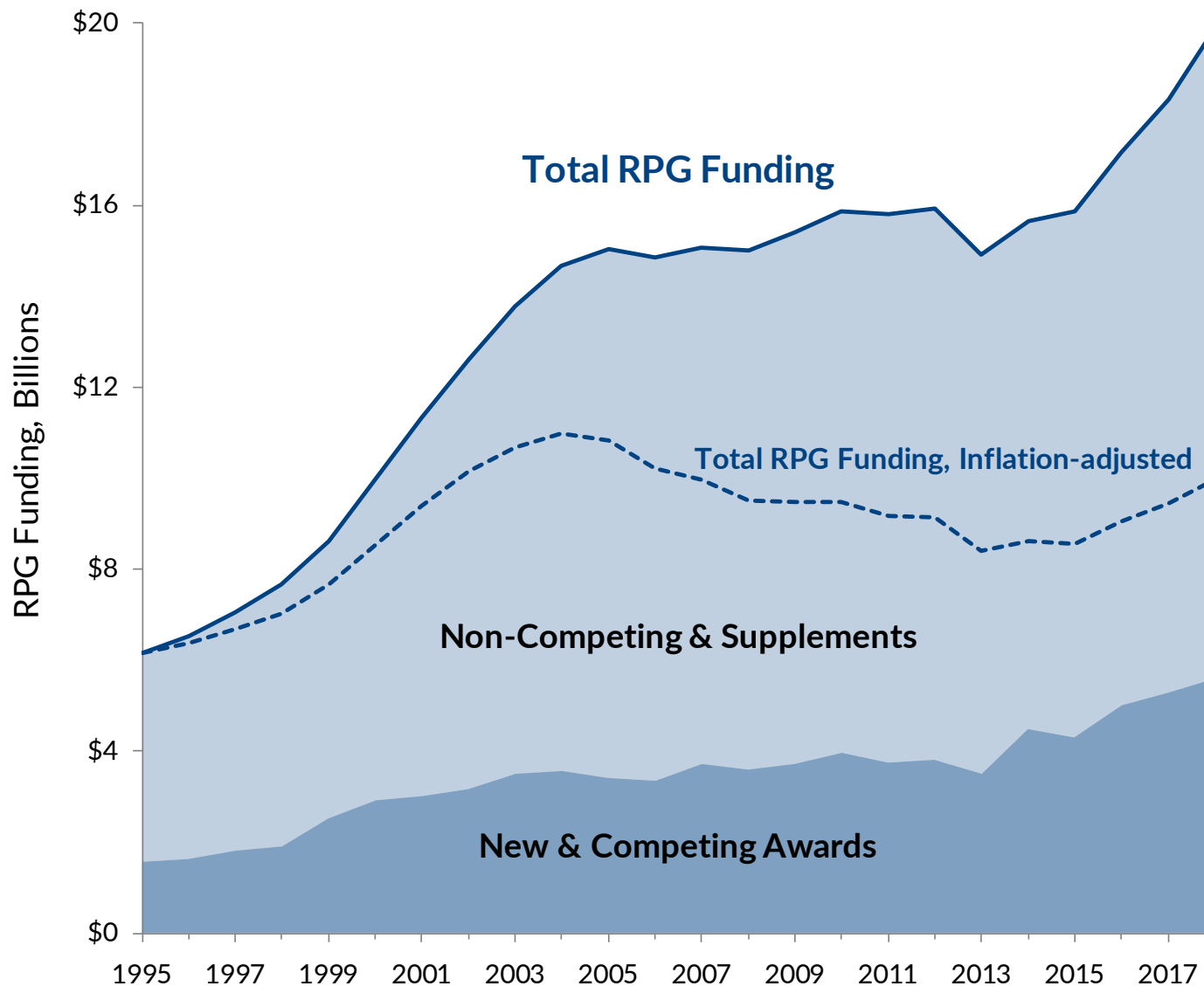
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# NIH Grants

- RPG Funding
- Number of RPGs
- R01-Eq Grant Funding
- Number of R01-Eq Grants
- R01-Eq Awards to First-Time Investigators
- Success Rates
- Funding Rates
- RPG Application & Applicant Trends
- NIH Budget with R01-Eq Trends

*Prior section: NIH Appropriations →*

# NIH Grants, Research Project Grant (RPG) Funding



- **Research Project Grants (RPGs) support a defined research project**
  - Includes ~50 different activity codes (grant categories)
- **RPG funding has closely tracked the NIH budget**
  - Since FY 1995, RPG funding constitutes 50-56% of the NIH budget
- **The proportion of funding for new and competing awards has increased.** This is due to greater use of shorter-term awards (e.g., the R21 activity code)

*New awards apply to applications that have not been previously funded (Type 1), and competing continuations apply to renewal applications (Type 2). Non-competing continuations and administrative supplements fund for already awarded grants in subsequent budget periods (i.e., funds for multi-year grants after the first year of funding). Inflation-adjusted (constant) dollars were calculated using the Biomedical Research and Development Price Index (BRDPI).*

**Sources:** NIH RePORT [Data Book](#), Budget and Spending [Table 101](#), and Success Rates [Table 210](#)

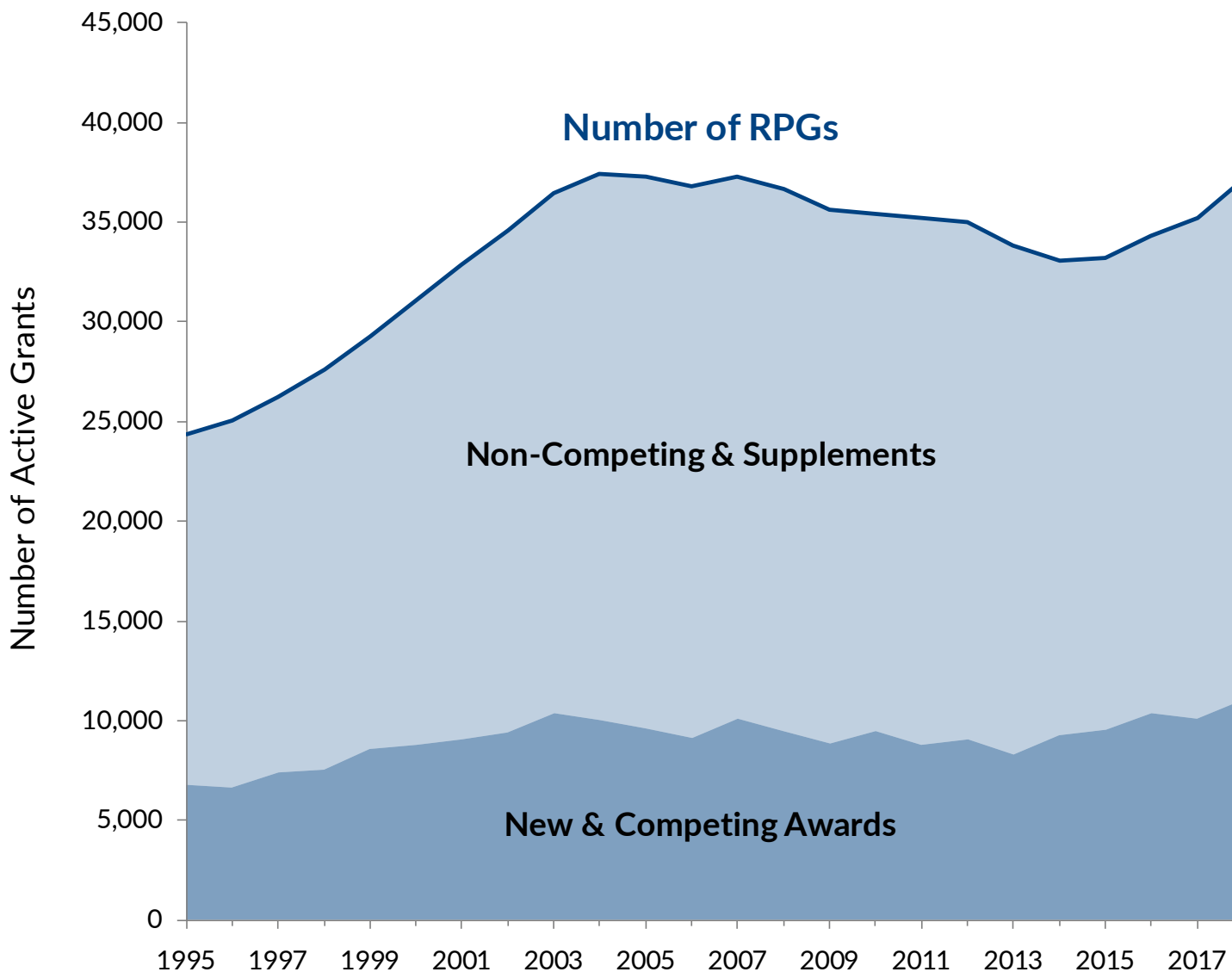


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# NIH Grants, Number of Research Project Grants (RPGs)



- Likewise, the number of RPG awards has risen and fallen with NIH's funding capacity
  - During the Restoration Era (since FY 2015), the number of active RPGs has increased by 12%
  - The inflation-adjusted NIH budget rose by 14% for this same period
- New and competing awards show higher year-to-year variation than the number of RPGs overall. That's because many RPGs provide funding for more than one year, creating out-year commitments. These outlays constrain how much of the budget can be used for new awards in subsequent years

*New awards apply to applications that have not been previously funded (Type 1), and competing continuations apply to renewal applications (Type 2). Non-competing continuations and administrative supplements fund for already awarded grants in subsequent budget periods (i.e., funds for multi-year grants after the first year of funding).*

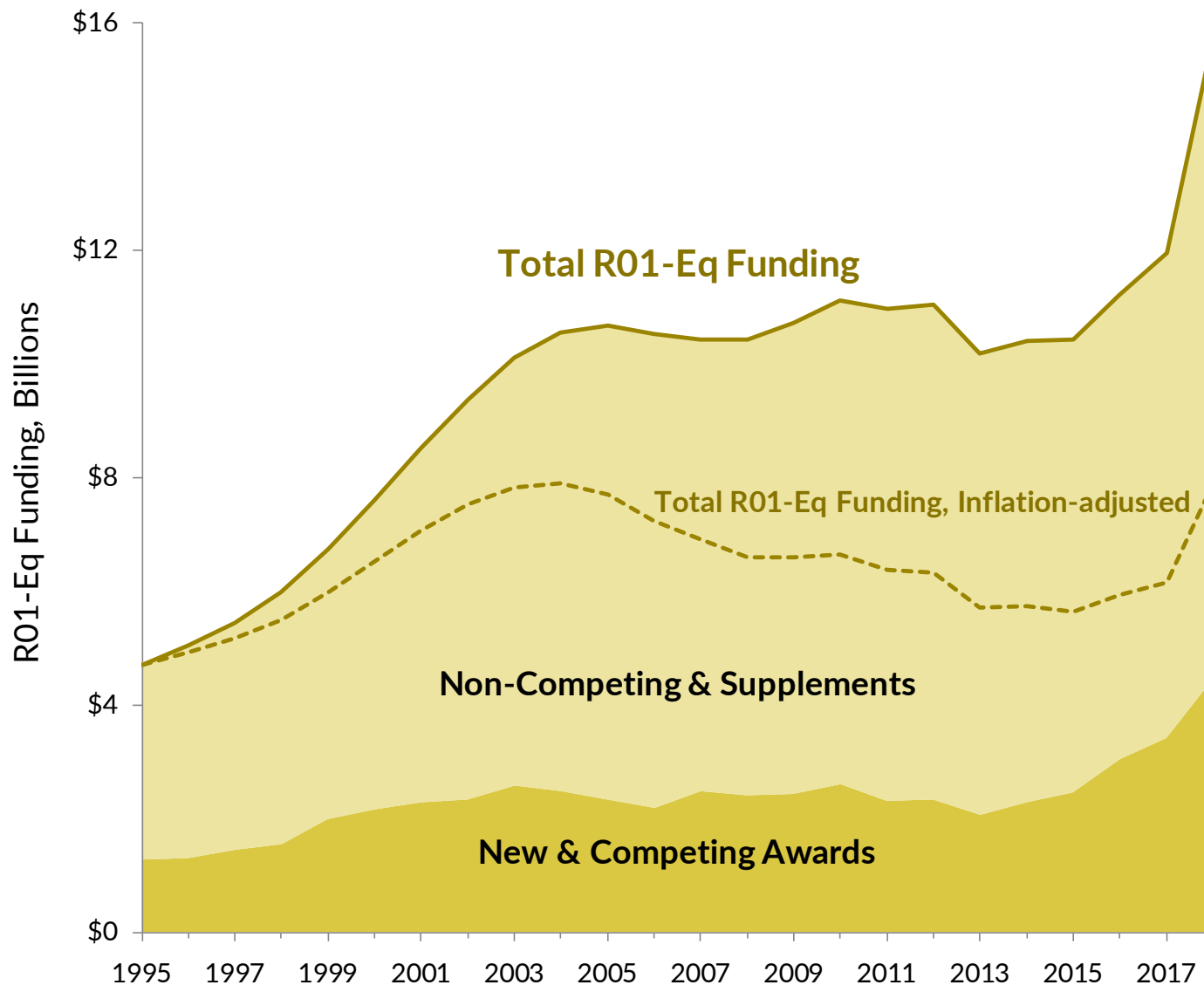
**Sources:** NIH RePORT [Data Book](#), Budget and Spending [Table 101](#), and Success Rates [Table 210](#)



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# NIH Grants, R01-Eq Grant Funding



- **R01 Equivalent (R01-Eq) grants are considered the gold standard of NIH awards.** A subset of RPGs, they provide multi-year funding for a research project. Many are investigator-initiated
- **R01-Eq funding constitutes 65-79% of RPG funding (FY 1995-2018)**
- **The amount of funding for R01-Eq awards skyrocketed recently due to a definition change.** In FY 2018, six grant types (activity codes) were added\*

\* R01-Eq now includes the following activity codes: DP1, DP2, DP5, R01, R37, R56, RF1, RL1, U01, and R35 MIRAs

R01-Eq includes “substantial NIH research grants like the R01 that are, or have historically been used as, funding vehicles to launch an independent research career.” New awards apply to applications that have not been previously funded (Type 1), and competing continuations apply to renewal applications (Type 2). Non-competing continuations and administrative supplements fund for already awarded grants in subsequent budget periods (i.e., funds for multi-year grants after the first year of funding). Inflation-adjusted (constant) dollars were calculated using the Biomedical Research and Development Price Index (BRDPI).

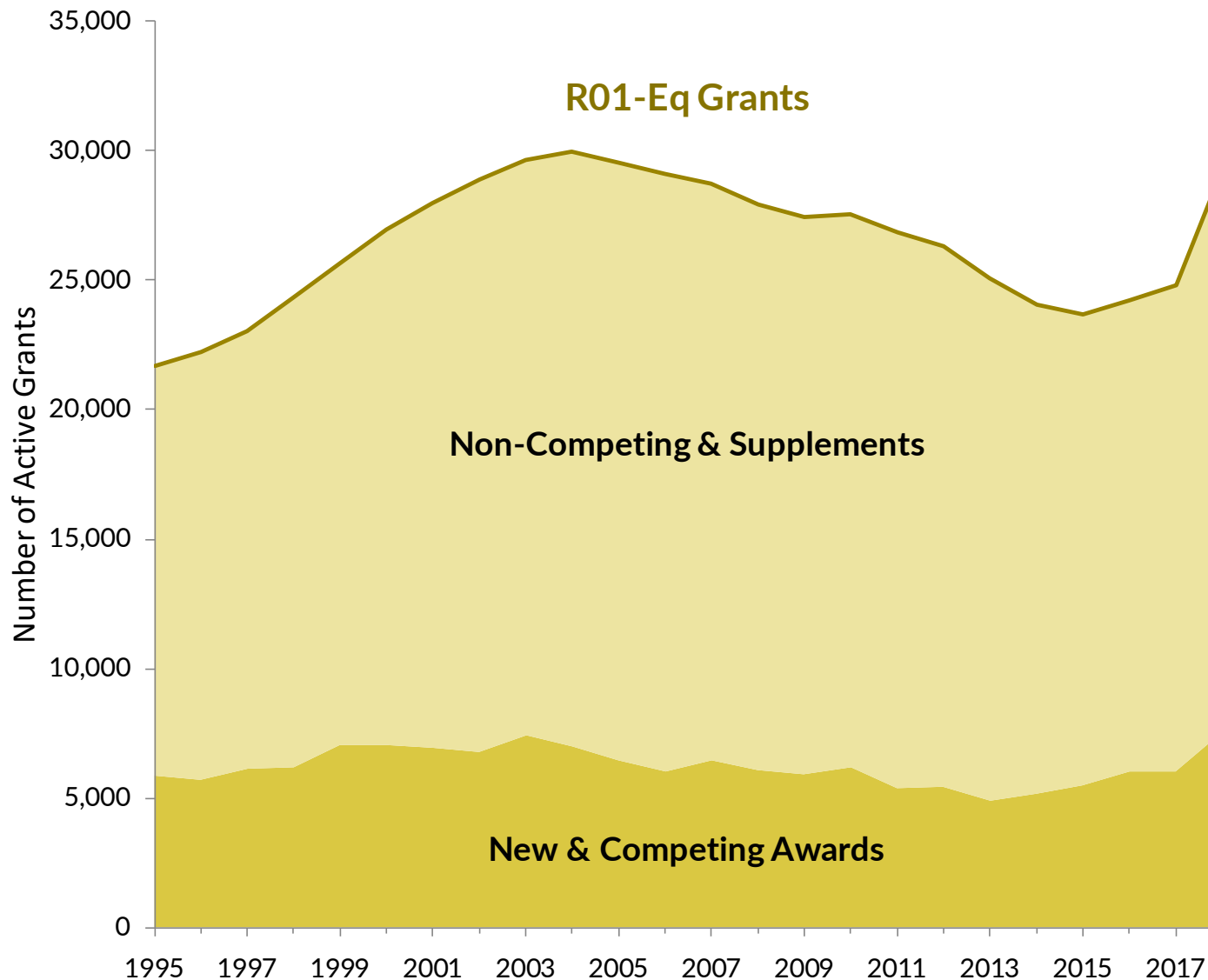
Sources: NIH RePORT [Data Book](#), Budget and Spending [Table 101](#), and Success Rates [Table 210](#)



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# NIH Grants, Number of R01-Eq Grants



- The number of R01-Eq awards has mirrored NIH's funding capacity
- Like RPGs, new and competing awards show higher year-to-year variation. That's because all R01-Eq mechanisms provide funding for more than one year, creating out-year commitments
- The number of R01-Eq awards also skyrocketed from the definition change in FY 2018\*

\* R01-Eq now includes the following activity codes: DP1, DP2, DP5, R01, R37, R56, RF1, RL1, U01, and R35 MIRAs

R01-Eq includes "substantial NIH research grants like the R01 that are, or have historically been used as, funding vehicles to launch an independent research career." New awards apply to applications that have not been previously funded (Type 1), and competing continuations apply to renewal applications (Type 2). Non-competing continuations and administrative supplements fund for already awarded grants in subsequent budget periods (i.e., funds for multi-year grants after the first year of funding).

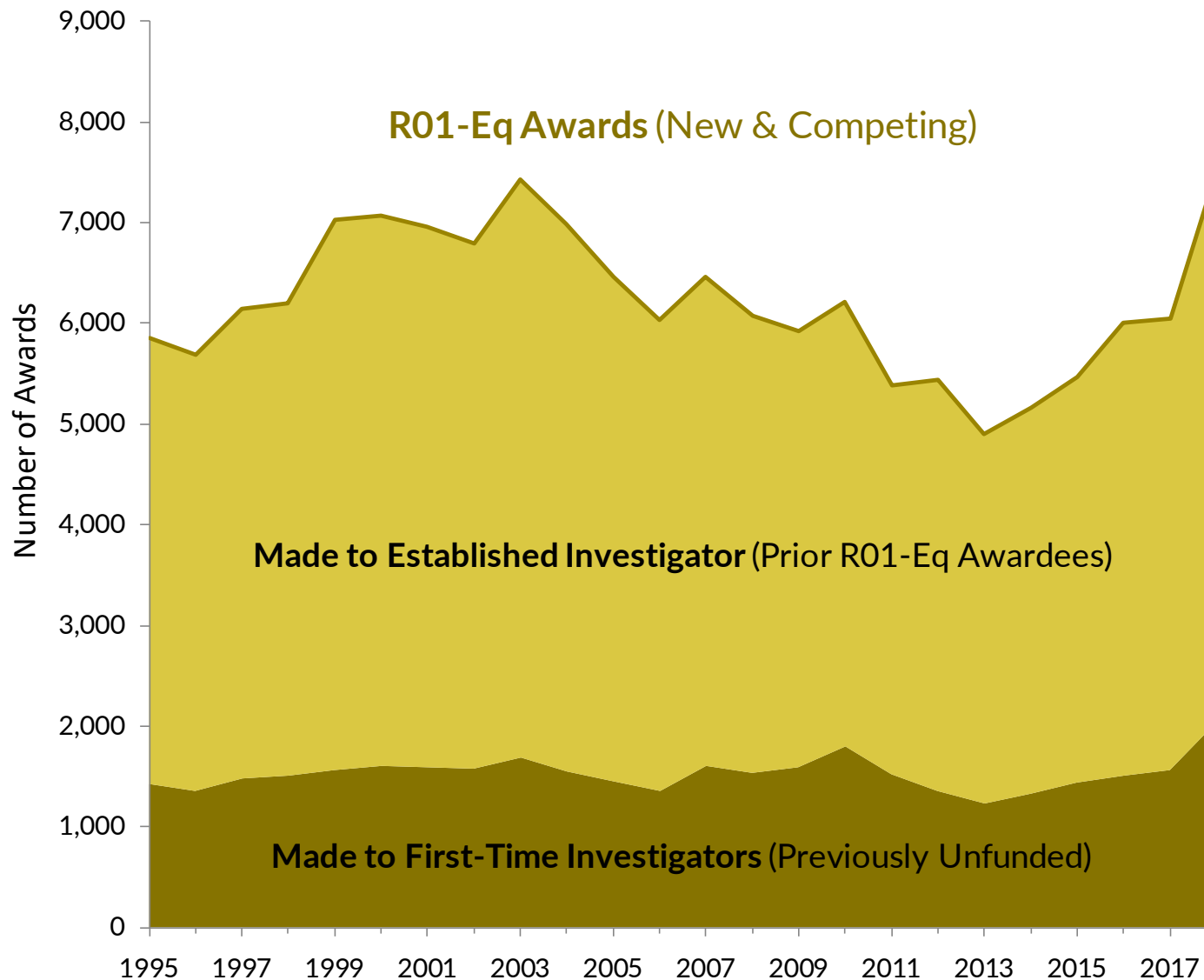
Sources: NIH RePORT [Data Book](#), Budget and Spending [Table 101](#), and Success Rates [Table 210](#)



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# NIH Grants, R01-Eq Awards to First-Time Investigators



- **“First-time” R01-Eq awards:**
  - Measure the number of R01-Eq awards made to applicants who had not previously received one (i.e., new investigators)
  - Constitute 22-29% of all R01-Eq awards during this period (27% in FY 2018)
- **The number of first-time awards made during the Post-doubling Decline era was more stable than R01-Eq awards overall.** This reflects NIH’s commitment to bring new investigators into the workforce, even when funding is constrained

R01-Eq includes “substantial NIH research grants like the R01 that are, or have historically been used as, funding vehicles to launch an independent research career.” New awards apply to applications that have not been previously funded (Type 1), and competing continuations apply to renewal applications (Type 2). First-time recipients measure the number of awarded applications submitted by investigators who had not previously received an R01-Eq award. First-time status only applies to the Contact Principal Investigator.

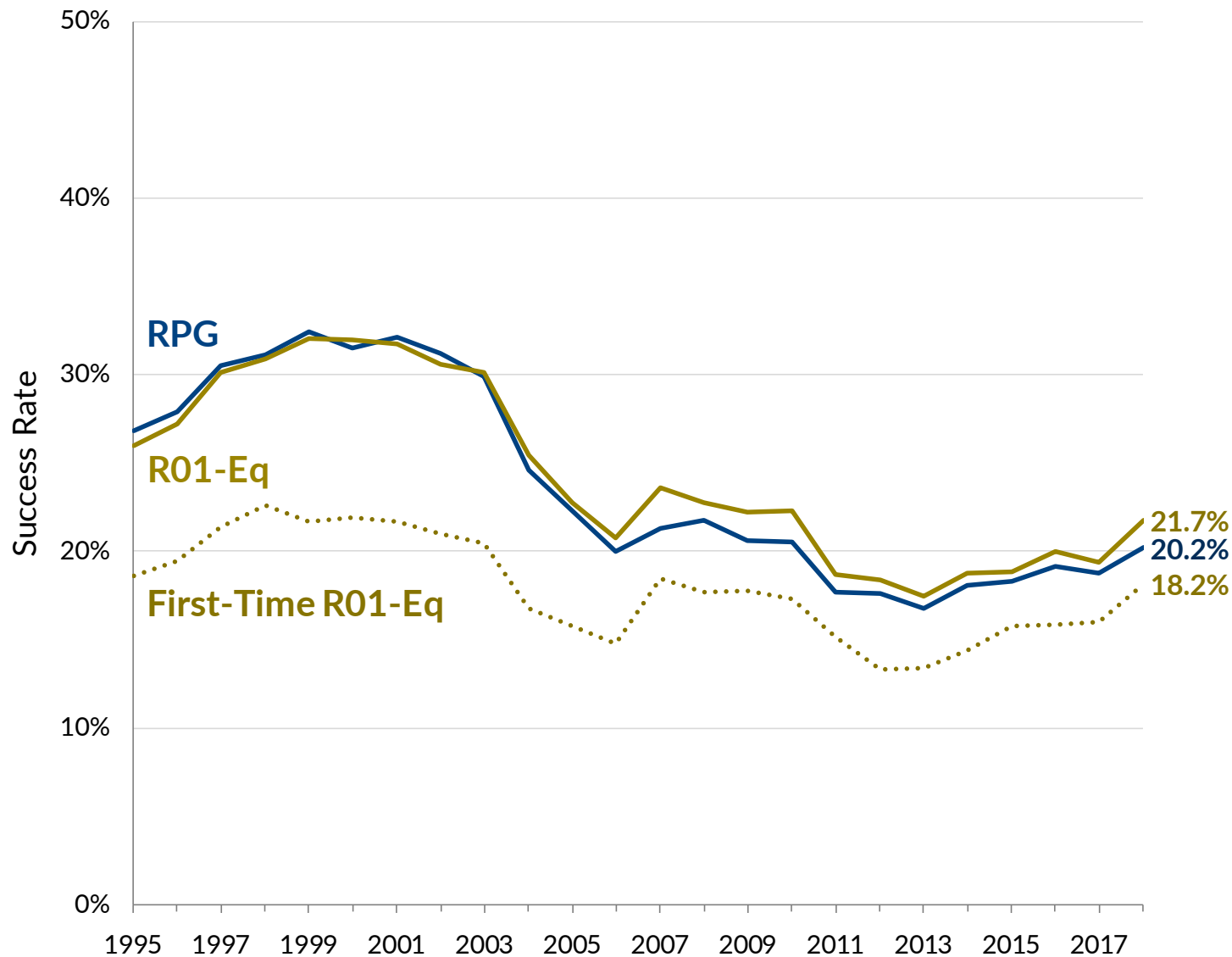
Sources: NIH RePORT [Data Book](#) and Success Rates [Table 210](#)



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# NIH Grants, Success Rates



- **Success rates** measure the likelihood of a grant application being awarded funding
- Since FY 2005, success rates have hovered near 20% for RPG and R01-Eq awards. (1 out of 5 applications receives funding)
- The success rate for first-time R01-Eq is approaching the overall R01-Eq success rate (i.e., the gap is shrinking)
- **Success rates for FY 2018:**
  - RPGs: 20.2% (1 in 5 investigators)
  - R01-Eq: 21.7%\*
  - First-time R01-Eq: 18.2%

\*NIH added six activity codes to its definition of R01-Eq in FY 2018; using the FY 2017 definition, the success rate would have been 20.4%

NIH calculates success rates by “dividing the number of competing applications funded by the sum of the total number of competing applications reviewed and the number of funded carryovers.” Rates are calculated on a fiscal year basis and include scored and unscored applications. If an unsuccessful application is resubmitted that same fiscal year, it is only counted once in the denominator.

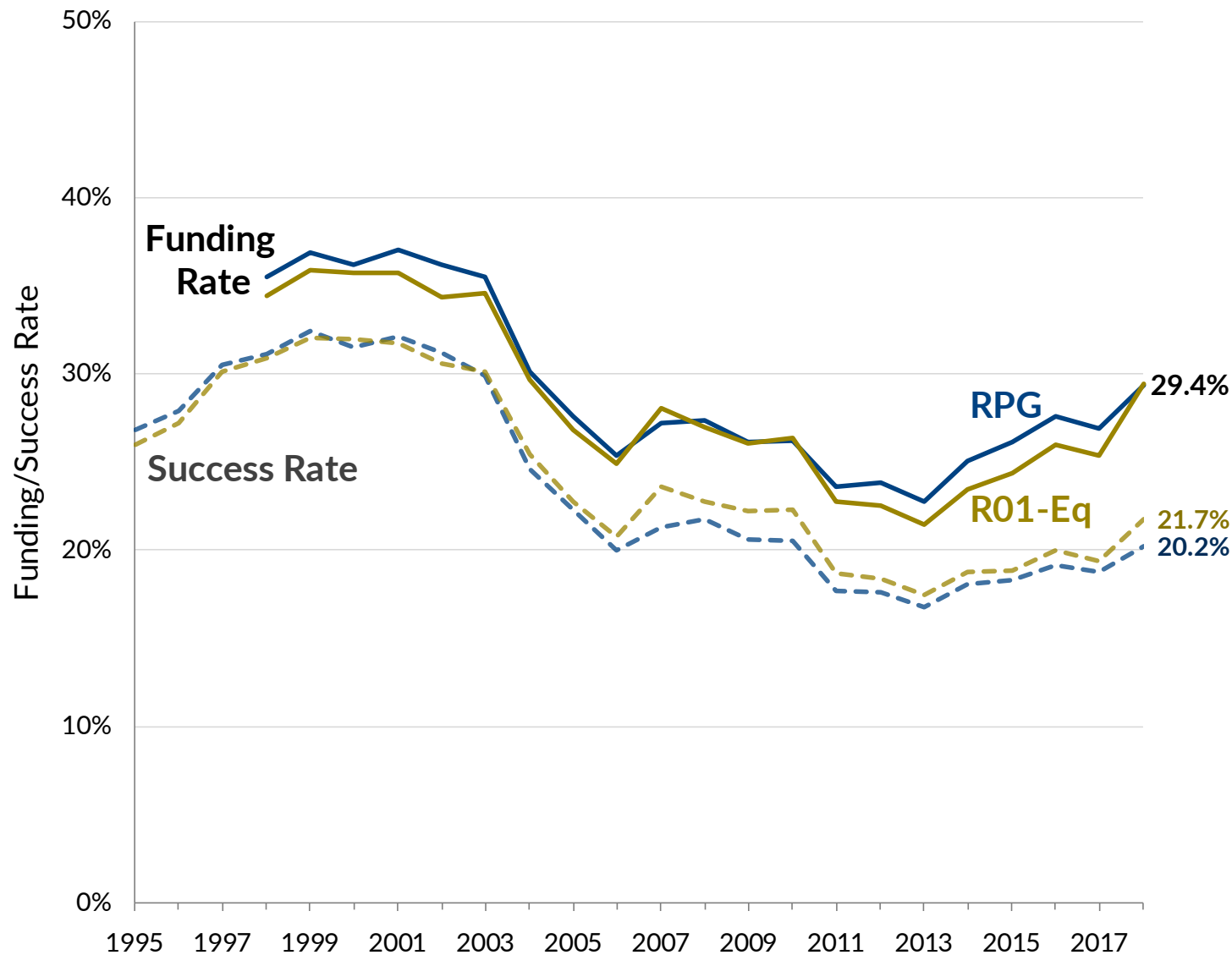
Sources: NIH RePORT [Data Book](#) and Success Rates [Table 210](#)



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# NIH Grants, Funding Rates



- **Funding rates** measure the likelihood of an investigator having at least one of their applications awarded
- Funding rates for FY 2018:
  - RPG: 29.4% (3 in 10 investigators)
  - R01-Eq: 29.4%\*
- Generally, success and funding rates rise and fall together. But funding rates are higher than success rates because investigators can submit more than one application per year

\*NIH added six activity codes to its definition of R01-Eq in FY 2018

The funding rate measures the percentage of applicants that received at least one award in that fiscal year. The two types of rates measure distinct (but related) outcomes; success rates measure the likelihood of an application receiving funding while funding rates measure the likelihood of an applicant (investigator) receiving funding.

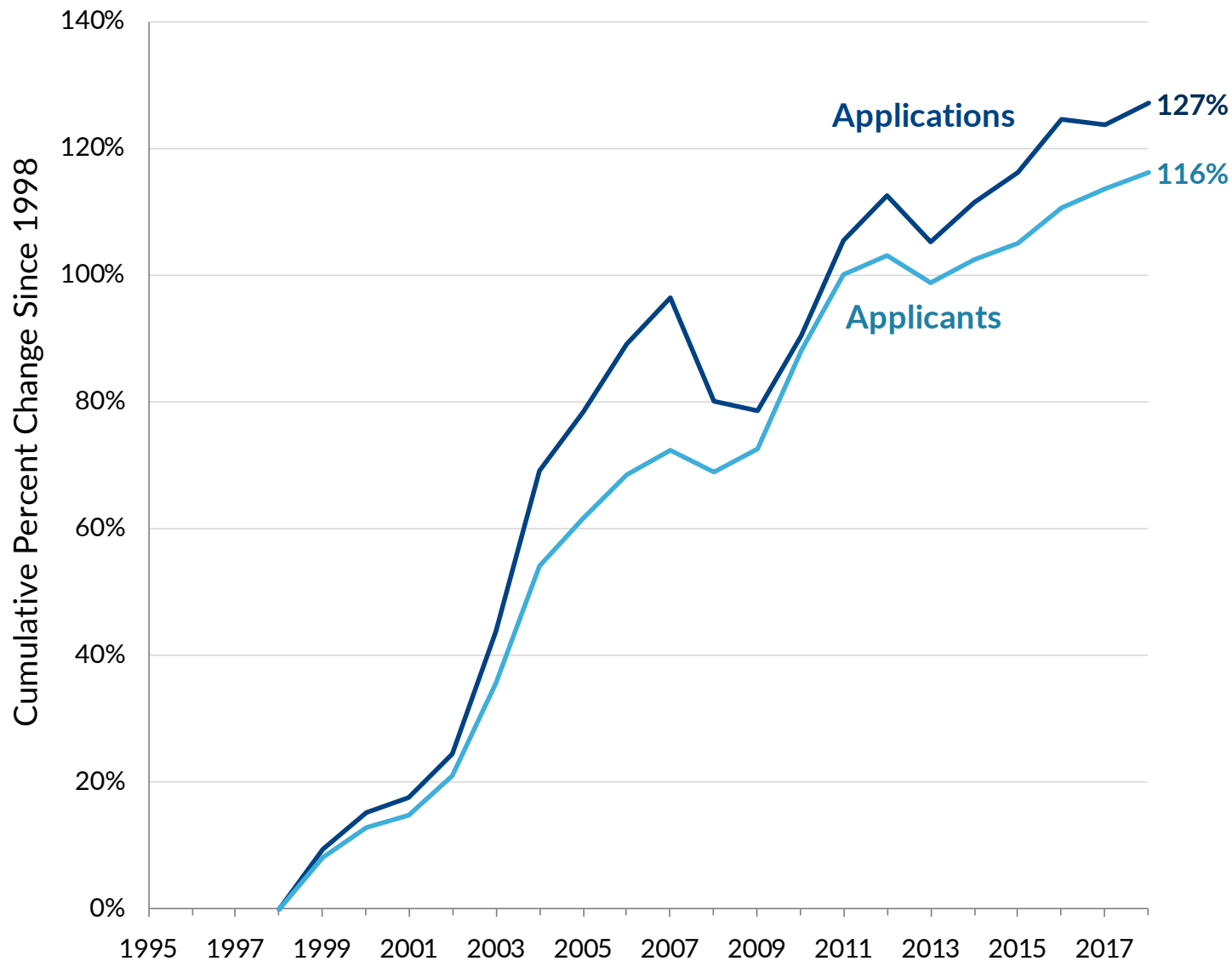
Sources: NIH RePORT [Data Book](#) and Success Rates [Table 210](#)



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# NIH Grants, RPG Application and Applicant Trends



- Over the past two decades (FY 1998-2018), the number of RPG applications doubled
  - The majority of growth is due to a 116% increase in applicants
  - But applications per applicant per year rose by only 5% over this period
- The number of investigators seeking NIH funding (applicants) is at an all time high
  - The increased demand for NIH grants has contributed to lower success rates
  - The biomedical workforce has untapped capacity

Cumulative percent change measures the percent difference in applications or applicants for the year in question as compared to the number in FY 1998. Because applicant data were not reported prior to FY 1998, both application and applicant trends start with that year.

Sources: NIH RePORT [Data Book](#) and Success Rates [Table 210](#)



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# NIH Grants, NIH Budget with R01-Eq Trends

		FY 1995	FY 2003	FY 2018	% Change since 1995	% Change since 2003
<b>NIH Budget</b> (inflation-adjusted, 1995 \$ millions)		\$11,300	\$21,080	\$19,213	70%	-9%
<b>Total Funding</b> (inflation-adjusted, 1995 \$ millions)		\$4,718	\$7,839	\$7,902	67%	1%
<b>R01-Eq</b>	<b>Grants</b> (new, competing, continuing, & supplements)	21,680	29,626	29,247	35%	-1%
	<b>Awards</b> (new & competing)	5,849	7,430	7,517	29%	1%
	<b>Applications</b>	22,542	24,634	34,584	53%	40%
	<b>Success Rate</b>	25.9%	30.2%	21.7%	-16%	-28%
	<b>Awards</b> (new & competing)	1,421	1,689	2,037	43%	21%
<b>First-time R01-Eq</b>	<b>Applications</b>	7,647	8,265	11,210	47%	36%
	<b>Success Rate</b>	18.6%	20.4%	18.2%	-2%	-11%

- NIH's funding capacity has grown by 70% since 1995. However, it remains 9% below its historic peak
- The number of R01-Eq applicants (investigators) has rapidly expanded. The majority of this growth occurred after the Doubling Era
- Success rates for R01-Eq grants remain depressed at around 20%

NIH budget figures measure total programmatic level funding. Inflation-adjusted (constant) dollars were calculated using BRDPI. From FY 1995-2015, the R01-Eq comprised R01, R23, R29, and R37 activity codes. The following were subsequently added: RF1 (FY 2016); DP2 (FY 2017); DP1, DP5, R35 MIRA, R56, RL1, and U01 (FY 2018). First-time recipients measure the number of awarded applications submitted by investigators who had not previously received an R01-Eq award (applies only to the Contact PI).

Sources: NIH RePORT [Data Book](#), Budget and Spending [Table 101](#), and Success Rates [Table 210](#)  
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