Extramural Funding Trends and Support of Core Values

The NIDDK’s core values emphasize maintaining a strong investigator-initiated R01 program, preserving a stable pool of talented new investigators, supporting key clinical studies and trials, and continuing strong support of training and career development programs, consistent with the vision of NIDDK Director, Dr. Griffin P. Rodgers (see Director’s Message).

At the NIDDK’s May 2012 Advisory Council meeting, NIDDK Deputy Director Dr. Gregory Germino highlighted these values and reviewed the NIDDK’s resource focus on areas supporting the core values.

Following that presentation, the NIDDK generated additional data on application and funding trends to help our research community understand application and funding dynamics over recent years and demonstrate the NIDDK’s commitment to research and programs associated with the NIDDK’s core values and posted these data on the NIDDK website. The NIDDK updates the charts on its website annually; the data shown here were recently updated to include Fiscal Year (FY) 2016.

NIDDK Funding Outcomes for Fiscal Year 2016 and Historical Application and Funding Trends

With the exception of Figure 8 (which includes initiative data), the data in all charts exclude initiatives (i.e., Requests for Applications, or RFAs), grants funded through the Special Statutory Funding Program for Type 1 Diabetes, and funds appropriated through the American Recovery and Reinvestment Act (ARRA).
FIGURE 1: NUMBER OF NIDDK COMPETING R01 APPLICATIONS SCORING WITHIN THE TOP 50TH PERCENTILE AND NUMBER OF NIDDK PERCENTILED R01 APPLICATIONS FUNDED IN FY 2016

Note: “Applications” shown in the chart above include all applications that scored 50th percentile or better. Unscored applications, scored applications with no percentiles, and applications scoring above the 50th percentile are not shown (49 percent [n=1,433] of the applications received were unscored, scored but did not receive a percentile, or scored above the 50th percentile). No unscored applications were funded in FY 2016.

The NIDDK nominal payline in FY 2016 was the 13th percentile for established investigators and the 18th percentile for Early Stage Investigators (ESIs). The payline and additional programmatic scrutiny for R01 applications requesting more than $500,000 in direct costs are substantially more stringent. These data show that the NIDDK adheres closely to its payline, but does exercise programmatic discretion to include a limited number of programmatically important applications.
To generate the data for Figure 2, applications were placed into “percentile bins” as follows: bins 1 to 5 include all applications with percentile scores from 0.1 to 5.0, bins 6 to 10 include applications with percentile scores from 5.1 to 10.0, etc. Only applications that scored 50th percentile or better were included in the analysis.

The data demonstrate steep deflections in the percentage of applications funded at or above the nominal payline for each year. The R01 paylines for the years included in Figure 2 are shown in the table to the right.

Note: In FY 2012, the NIDDK began focusing on Early Stage Investigators (ESIs; see definition on the NIH “New and Early Stage Investigator Policies” webpage at http://grants.nih.gov/grants/new_investigators/index.htm), a subset of New Investigators. For more information on the benefits that the NIDDK conveys to ESIs, see the NIDDK New and Early Stage Investigators page at https://www.niddk.nih.gov/research-funding/process/apply/new_early_stage_investigator/Pages/new_early_stage_investigator.aspx (See also Figures 11 and 12.)
Only funded applications are considered in the data set used to generate Figure 3. Percentile bin size equals one percentile and there is no overlap between bins. Percentiles with decimal places were summed into the next highest integral percentile as follows: 0.1-0.9 was summed into 1, 1.1-1.9 was summed into 2, etc. These cumulative funding data again demonstrate that the vast majority of applications funded by the NIDDK fall within the payline, but that the NIDDK does exercise programmatic discretion to include a limited number of programmatically important applications. Note that in FY 2016 a limited number of R01 applications in response to specific Funding Opportunity Announcements received a priority score, but not a percentile score. Some of these applications were funded and hence included in this chart. No unscored/streamlined applications were funded in FY 2016.
Figure 4 shows a substantial increase in the number of competing R01 applications received by the NIDDK between FYs 1997 and 2016. After some years of relatively flat growth, FYs 2013-2016 have again shown increases. The observed increases between FYs 1997 and 2006 and between FYs 2013 and 2016 were primarily due to increases in the number of new (Type 1) applications. The number of competing renewal applications showed some fluctuation between FYs 1997 and 2016, but overall the number of renewal applications has slightly decreased.
During the doubling of the NIH budget (FYs 1998-2003), the total number of R01/R37 grants funded by the NIDDK increased significantly. After leveling off following the doubling, the number of grants funded by the NIDDK has declined since FY 2007. Prior to FY 2009, slightly fewer than half of the competing grants funded by the NIDDK were new (Type 1) awards in most years. However, since FY 2009 that proportion has risen to 73 percent (in FY 2016).
Figure 6 shows that NIDDK expenditures on R01 grants have more than doubled (113 percent increase) since FY 1997. This is because the NIDDK is funding a larger number of these awards (Figure 5), and because the median cost of an R01 has increased substantially (Figure 7).
Figure 7 illustrates that the median cost of R01 awards has increased approximately 75 percent since FY 1997.
Figure 8 shows that relative funding levels of most NIDDK extramural research categories have remained fairly stable since FY 2007. The original version of these data, encompassing FYs 2003-2011, was presented to the NIDDK’s Advisory Council in May 2012 in the context of the NIDDK’s core values. The NIDDK core values emphasize maintaining a strong investigator-initiated R01 program, preserving a stable pool of talented new investigators, supporting key clinical studies and trials (such support is generally represented in the Initiatives and Contracts categories), and continuing strong support of training and career development programs. Figures 9 through 12 illustrate other examples of how the NIDDK’s portfolio has reflected NIDDK core values over time.

**NIDDK Portfolio Categories:**

- **R01/R37** – Investigator-initiated (excludes R01s responding to NIDDK RFAs)
- **Other R** – Includes other R activities (i.e., R03, R13, R15, R18, R21, R34, SBIR/STTR, etc.) but excludes R24s and applications submitted to NIDDK RFAs
- **Initiatives** – Awards made in response to NIDDK RFAs; includes most NIDDK large clinical trials and consortia
- **Collaborative Grants** – P01s and R24s that are not “mini-Centers”
- **Centers** – Includes all non-P01 P awards and R24 “mini-Centers”
- **Career Development** – Includes all Ks (including K99/R00)
- **Training** – Includes all F and T activities
- **Other Research** – Everything not captured in the other categories
- **Contracts and Interagency Agreements (IAAs)** – Includes some large clinical studies
Figure 9 shows that the number of principal investigators (PIs) supported by at least one R01 or R37 remained relatively stable between FYs 2007 and 2016, with slight increases from FYs 2010-2012. It should be noted that in FY 2008 NIH, for the first time, began making multiple principal investigator R01 awards to support team science projects. The observed increases in numbers of PIs supported by the NIDDK immediately following FY 2008 are largely attributable to multiple PI R01 awards. The subsequent changes in numbers of PIs supported by the NIDDK from FY 2012-2016 may, in part, reflect the more stringent paylines during this period, but other factors may also be involved.
Between FYs 2007 and 2010, the NIH and the NIDDK established new policies focused on New Investigators, and these policies appear effective in mitigating downward pressures on New Investigator awards. After FY 2011 the number of New Investigator applications and awards declined. However, the numbers of New Investigator applications have since recovered and the number of New Investigator awards have fluctuated around about 100 per year. It should be noted that these data count applications and awards, not persons.
Comparison of Figures 10 and 11 shows that while ESI applications fell in FY 2012 essentially in proportion to the total drop in New Investigator applications, the proportional drop in number of awards to ESIs was not as great. This is attributable in part to the NIDDK’s differential payline for ESI applications (see table accompanying Figure 12 and the NIDDK New and Early Stage Investigators page at https://www.niddk.nih.gov/research-funding/process/apply/new_early_stage_investigator/Pages/new_early_stage_investigator.aspx). Although there is moderate fluctuation from year to year in the numbers of ESI applications and awards, the differential payline is contributing to a healthy success rate for these applications.
Figure 12 shows that the NIDDK’s differential payline for ESIs from FY 2012-2016 (see table accompanying Figure 2 and the NIDDK New and Early Stage Investigators page at https://www.niddk.nih.gov/research-funding/process/apply/new_early_stage_investigator/Pages/new_early_stage_investigator.aspx) has been effective in enhancing ESI representation among New Investigator awards.
Over the past 10 years, the mean and median ages of investigators holding R01/R37 awards (competing and non-competing) increased by approximately 1 year. This observation is consistent with a long-term trend observed across the NIH.
Figure 14 demonstrates that the NIDDK continues to commit a substantial proportion of its research funding to the support of clinical research involving human subjects. For the purpose of this analysis, we used the definition described in Kotchen et al., 2004 (JAMA 291: 836-843) and included all studies coded as using human subjects (HS+).
FIGURES 15A TO 15D: THE NIDDK IS COMMITTED TO TRAINING THE NEXT GENERATION OF SCIENTISTS

Figures 15A-D demonstrate that the NIDDK’s commitment to training and developing the careers of the next generation of scientists remains strong. Figure 15A shows that overall support of training and career development programs has remained basically stable since FY 2006 and that the slight deceleration of T award support was offset by an increase in support of F awards (by design). Figures 15B and D illustrate that the numbers of NIDDK T awards and associated training slots/positions have remained relatively stable. Figure 15C shows that while the number of NIDDK K08 (Mentored Clinical Scientist Development Awards) has decreased since FY 2007, the numbers of K01 (Mentored Research Scientist Development Awards) and K23 (Mentored Patient-Oriented Research Career Development Awards) have increased. The NIDDK will continue to monitor carefully its training and career development programs to ensure appropriate balance.

FIGURE 15A: NIDDK FELLOWSHIP (F), CAREER DEVELOPMENT (K), AND TRAINING (T) AWARDS AS A PERCENT OF TOTAL EXTRAMURAL RESEARCH FUNDING
FIGURE 15B: NUMBERS OF NIDDK FELLOWSHIP (F), CAREER DEVELOPMENT (K), AND TRAINING (T) AWARDS BY FISCAL YEAR
FIGURE 15 A TO 15D

FIGURE 15C: NUMBER OF NIDDK CAREER DEVELOPMENT (K) AWARDS BY ACTIVITY AND FISCAL YEAR
FIGURE 15D: NUMBER OF NIDDK TRAINING (T32) AWARD SLOTS BY FISCAL YEAR

Note: T32 awards made in FY 2016 continue into FY 2017. The total number of T32 slots are reported at the end of the award period. Therefore, the FY 2016 information on T32 slots will not be available until later in FY 2017; thus, unlike the previous charts, FY 2016 data are not included here.