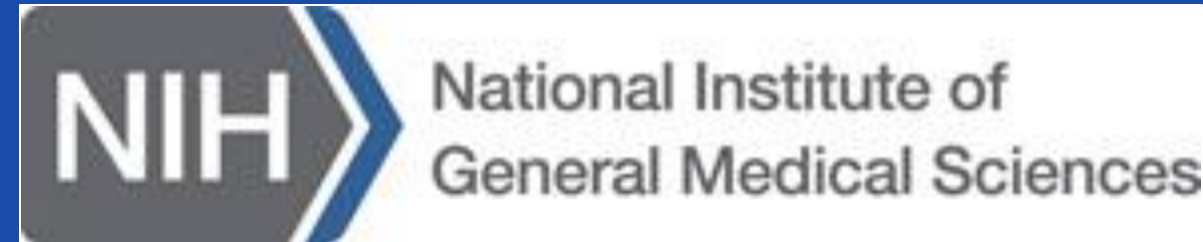


Modeling Financial Impact of the Maximizing Investigator Research Award (MIRA)

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Abstract

Against the backdrop of a tightening fiscal climate, maximizing the return on investment in fundamental biomedical research is a contentious topic, and one subject of renewed interest on the part of funding institutions like the NIH. In order to increase this return on investment, NIGMS is focusing on improving the efficiency of its funding by creating a pilot program for a novel grant mechanism. This new grant, known as the Maximizing Investigator Research Award (MIRA), will support an investigator's research program, rather than specific aims. This single source of funds will allow for greater flexibility, stability, and reduce administrative burden. To test various proposed implementation strategies and operationalize this new grant mechanism, we have created a model that calculates the budget available for MIRA, the number of investigators that could be funded, and the average award amount per investigator based on the impact of various funding decisions.

Objectives

By creating a robust model capable of testing several different funding decisions and assumptions, we hope to not only provide decision makers with a tool to identify the best routes for funding this new grant mechanism while maintaining budget neutrality, but also help initiate a shift from descriptive to predictive analysis.

Methodology

The data utilized in the model were taken from current and historical grants associated with researchers who submitted an application for MIRA.

Because MIRA is intended to be a replacement for an investigator's R01-equivalent funding, we limited the grant mechanisms considered for a PI's current and historical funding to only R01-equivalent mechanisms.

- To obtain current funding, we pulled down the Award Commitments file for each applicant based on FY2014 actuals.
- We then obtained the last 10 years of R01-equivalent funding history for each PI in this list.
- After combining this data, we calculated historical averages and peaks for each PI over the last 3, 5, and 10 years.
- The requested funding level of each PI was also obtained from the current MIRA application and was added to the dataset.

The Model

The key decision to be made concerning the MIRA pilot is what level will PI's be funded with this new mechanism. NIGMS leadership identified 10 possible funding scenarios that they would like to test to understand the financial impact of the pilot program.

Table 1: Proposed Funding Scenarios

Funding Scenarios
Scenario 1: Funded at 5-yr Avg
Scenario 2: Funded at 5-yr Peak
Scenario 3: Funded at 10-yr Avg
Scenario 4: Funded at 10-yr Peak
Scenario 5: Funded at Various Levels
Scenario 6: Funded at Decrease from Current Funding
Scenario 7: Funded at Decrease from Requested Funding
Scenario 8: Funded at Decrease from Requested (variable)
Scenario 9: Funded at 3-yr Avg
Scenario 10: Funded at 3-yr Peak

While many of the scenarios are straight-forward and based on a PI's historical level of funding, Scenarios 5-8 are more involved. The model, therefore, requires input of certain parameters from the user in order to calculate the financial impact.

- **Scenario 5:** Users choose the percentage of applicants in each of 10 categories ranging from 100% decrease in funding to 100% increase.
- **Scenario 6/7:** Users choose the percent decrease from the current/requested level of funding.
- **Scenario 8:** Users select a historical average (3, 5, or 10 years) to compare to the requested level of funding. Users then provide the percentage decrease for PI's requesting an amount greater than the selected average and the percentage decrease for those requesting at or below the selected average.

To provide decision makers with additional flexibility, the MIRA model allows for several additional parameters and assumptions to be changed. These include percentage of PI's who would apply for renewals on current projects and the renewal success rate. As a starting point, these rates were calculated from historical data for the MIRA applicants.

Using these new parameters, we calculated the number of investigators that could be funded, the average award amount, and the total cost subject to the constraint that the program remain budget neutral under each of the 10 possible funding scenarios.

In cases where the funding scenario resulted in either a budget shortfall or a surplus, we also calculated how much the average award amount would need to be either decreased or increased to maintain budget neutrality.

Table 2: Funding Scenario Outcomes

Funding Scenarios	Surplus/Shortfall	Budget Neutral Mod to Award
Scenario 1: Funded at 5-yr Avg	\$ (7,761,507)	-8.3%
Scenario 2: Funded at 5-yr Peak	\$ (29,752,445)	-31.8%
Scenario 3: Funded at 10-yr Avg	\$ (1,940,377)	-2.1%
Scenario 4: Funded at 10-yr Peak	\$ (33,633,199)	-35.8%
Scenario 5: Funded at Various Levels	\$ 19,515,501	26.2%
Scenario 6: Funded at Decrease from Current Funding	\$ (2,587,169)	-2.8%
Scenario 7: Funded at Decrease from Requested Funding	\$ 10,796,243	13.0%
Scenario 8: Funded at Decrease from Requested (variable)	\$ 13,161,640	16.3%
Scenario 9: Funded at 3-yr Avg	\$ (13,582,638)	-14.5%
Scenario 10: Funded at 3-yr Peak	\$ (27,812,068)	-29.6%

Outputs

Since comparing various funding scenarios is the main focus of this model, we produced two main visualizations of the model outputs.

- First, we provided NIGMS leadership with the aggregated results of the model, which included the total number of PI's that could be funded along with the Average Award Amount suggested by the model and the calculated Budget Neutral Award Amount for each scenario.
- Second, we provided the distribution of current funding for PI's, and allowed users to choose a funding scenario to overlay that shows the calculated distribution suggested by the model. This gives decision makers insight into how different funding decisions can have differential impact on PI's based on their current level of funding.

Next Steps

As the pilot program continues to evolve, we plan to update several key aspects of the model:

- **Updated Data:** Currently, the model is based on FY2014 Actuals, but once FY2015 actuals become available, we will incorporate this into the model to provide a more accurate depiction of the current funding landscape.
- **Scientific Review:** Once the scientific review of the MIRA applications is completed, we will update the model with any budget recommendations they provide.
- **New Investigator MIRA:** Currently, the MIRA model is only based on the established PI version of MIRA. Once the new investigator pilot begins accepting applications, we will create a separate model, since the same historical/current funding considerations will not be appropriate for those PI's.