

How can we invest to make science more innovative and impactful?

Alyson Wilson, Ph.D.
North Carolina State University
<http://alysongwilson.github.io>

The web site for the directed study is:

<https://alysongwilson.github.io/nysc2020.html>

When I was working at the Science and Technology Policy Institute the Director of NIH asked us to conduct a study to evaluate the **NIH Director's Pioneer Award (NDPA)**.

- The NDPA was in its 10th year, which was the last year the Director could fund it without turning the program over to the Institutes.
- Does NDPA-funded research produce *unusually high impact* as compared to research funded by other programs?
- Are the research approaches used by the Pioneers more *innovative* as compared to research funded by other programs?

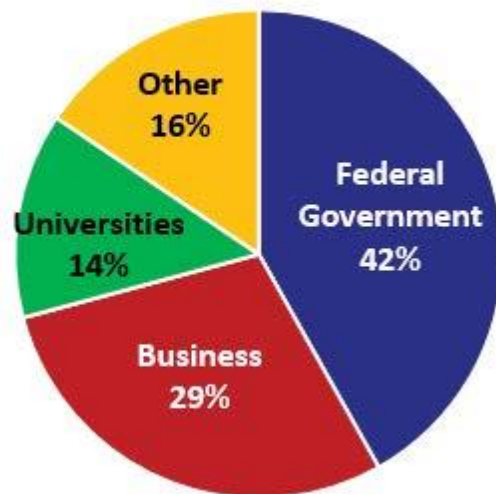
What is the federal budget for science?

- The total U.S. R&D budget for 2020 is \$156.0 Billion.
 - \$64.5 B is “defense” R&D
- Basic and Applied, each 30%, Development 40%

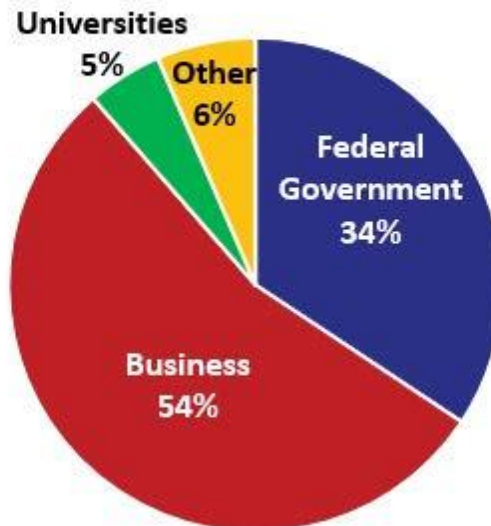
What agencies spend money on science?

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|---------------------------------|-----------------|-------|
| • Department of Defense | \$64.5B (41.3%) | } 95% |
| • National Institutes of Health | \$40.2B (25.8%) | |
| • Department of Energy | \$19.2B (12.3%) | |
| • NASA | \$14.1B (9.0%) | |
| • National Science Foundation | \$6.8B (4.4%) | |
| • Department of Agriculture | \$2.9B (1.9%) | |
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- Department of the Interior, Veterans Administration, Department of Commerce, Department of Transportation, Department of Homeland Security

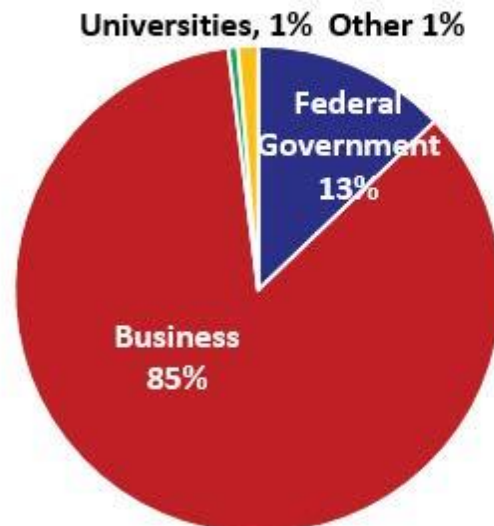
Basic Research



Applied Research



Development



STUDY QUESTIONS AND OVERALL APPROACH

About the NDPA Program



- Run out of Office of the Director
- 5-page application reviewed externally (much shorter)
- Interview by external panel (not usually done)
- Three high-level criteria (although Year 1 focused solely on applicant, Years 2+ focused on applicant + project)
 - Scientific problem to be addressed
 - Investigator
 - Suitability for NDPA mechanism
 - (Typical review for “impact and innovation”)
- 5 years of funding, \$2.5M (longer time, more money)
- Substantial flexibility in how funds are used

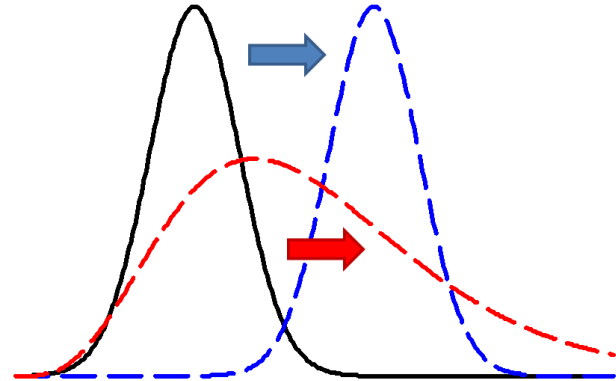
Primary Study Questions

- Does NDPA-funded research produce **unusually high impact** as compared to research funded by other programs?
- Are the **research approaches** used by the Pioneers more **innovative** as compared to research funded by other programs?



Concept Behind the Evaluation

- In a traditional research portfolio (e.g., R01), some fraction of the funded research outcomes are breakthrough
- If a set-aside program is focused specifically on producing breakthrough research, it must do better
- NIH has requested that the NDPA program be compared to other grant programs.



Your job is to produce a *study design* for this evaluation.

- How will you operationalize *impact* and *innovation*?
 - Describe what you would like to compare the NDPA program to (e.g., characteristics of the other grant programs).
 - What data would you like to have? Why? How much? On whom or what? From when and lasting how long?
 - What metrics will you evaluate with the data?
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- Don't worry about the feasibility or cost of the data and the analysis.
 - In real life, that's Step 2. First we have to develop a range of concepts.
 - NDPA has focused a great deal on *process*. You are focusing on the *performance* metrics.
 - Remember the idea of operational definitions.
 - Be prepared to discuss your study design with the whole group.