

Health Care

## NIH investment as effective as private sector for biopharma innovation, Bentley report shows



James H. Shannon Building on the National Institutes of Health campus in Bethesda, Maryland.

By [Rowan Walrath](#) – Life Sciences Reporter, Boston Business Journal  
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The federal government is just as effective an investor as private-sector players when it comes to biopharmaceutical innovation, according to a new report from Bentley University.

NIH funding played a role in all but two drugs approved over the course of a decade, with an average of \$1.4 billion spent on each drug. The public funding yielded savings of \$2.9 billion per drug, compared with \$1.5 billion in private-industry investment on each new drug and savings of \$2.8 billion, the research showed.

Data scientist Ekaterina Galkina Cleary and Bentley researchers Matthew Jackson, Edward Zhou and Fred Ledley analyzed 356 drugs approved between 2010 and 2019 to determine the amount the National Institutes of Health had invested in each approved drug. The researchers used similar data from a Tufts University group that had looked at private investment in biopharma products.

The Bentley team's findings were [published](#) in the scientific journal JAMA Health Forum last week.

Ledley acknowledges that this could be used as an argument against high drug prices, or even against private investment. But, he says, funding scientific research isn't an either-or situation.

"There's things that the industry is very good at. There's things the public sector is very good at. And the combination is unbelievable," said Ledley, a senior author on the study and director of Bentley University's Center for Integration of Science and Industry. "When you get those synergies right, it's the story of Kendall Square. There's enormous potential for not only economic returns but also social returns."

Drug developers typically defend the prices of new drugs by saying they need to make back some of the money they'd funneled into preclinical research, clinical trials and the scale-up of commercial teams, all in the relatively narrow window before competition from generics comes into play. That revenue, the argument goes, will also be funneled into future research and development.

Critics of the drug industry point to upfront taxpayer investment as a reason for companies to lower drug prices. Ameet Sarpatwari, an instructor at Harvard Medical School, [told the New York Times](#) in 2018 that taxpayers were effectively "paying twice" for the same medication. Sen. Bernie Sanders (I-Vt.) [made a similar case in March](#), accusing Moderna Inc. (Nasdaq: MRNA) CEO Stephane Bancel of corporate greed for quadrupling the price of the company's Covid-19 vaccine, which was funded in large part by the NIH and the Biomedical Advanced Research and Development Authority (BARDA).

But Ledley takes issue with that argument.

"We don't believe anyone is paying for anything twice here," Ledley said. "Ultimately, the combination of government spending and the revenues from drugs together have to add up to fund the R&D that has to be done. The public is not looking for economic returns. They're looking for health. They're looking for drugs that really help."

Ledley himself has spanned the academic and private-sector worlds. He began his career at Boston Children's Hospital and MIT and stayed in academia for some time, racking up over a decade of teaching at Baylor University and earning a position at the Howard Hughes Medical Institute. In 1993, he pivoted to industry, founding a gene therapy startup called GeneMedicine, then another in 1996 called Variagenics.

Ledley joined Bentley University in 2005 and in 2012 launched the school's Center for Integration of Science and Industry, which aims to "improve the efficiency of translating scientific discoveries to create public value."

The NIH mostly funds very basic research. From there, academics figure out how to apply that research, and private companies license their research and use it to develop new drugs — so the story typically

goes. According to the JAMA paper, 83% of the \$187 billion the NIH spent between 2010 and 2019 involved basic research on drug targets.

Ledley points out that such funding is scalable: When the government funds basic science, it goes in the public domain. It doesn't get used once. It gets used 2.8 times," Ledley said. "The crux of our argument is that this is very productive spending. It's what enables industry to do what they do. It's more expensive than people realize."