

THE BIOPHARMACEUTICAL INDUSTRY'S ROLE IN FUELING THE ECONOMY AND GLOBAL COMPETITIVENESS

The United States is recognized as the global leader of biopharmaceutical innovation. That global leadership is built upon an industry that performs and supports advanced research and development (R&D) resulting in innovative new treatments and cures. But beyond the value medicines deliver to patients is the profound impact the biopharmaceutical sector has on our local, state and national economies.

The economic impact of the biopharmaceutical industry and its closely-integrated supply chain translate into high-wage jobs, substantial tax revenue and growing economic output in our local communities. In fact, the combined effects of biopharmaceutical direct jobs, supply chain, wages and benefits resulted in \$1.3 trillion in economic output and 4.7 million jobs in 2015. And every job in the biopharmaceutical industry supported nearly five additional jobs, resulting from the broader impacts of its supply chain and the personal spending of its workforce (See Figure 1).ⁱ Sustaining the robust biopharmaceutical R&D enterprise in the United States will be critical to ensuring continued global competitiveness and creating high quality jobs and economic growth across the U.S. economy.

THE ECONOMIC REACH OF THE U.S. BIOPHARMACEUTICAL INDUSTRY

Every biopharmaceutical sector job supports nearly five additional jobs outside the industry.

803,000 Direct Jobs

1,817,000 Indirect Jobs

2,146,000 Induced Jobs

4,766,000 TOTAL JOBS

Source: TEconomy Partners

AMERICA'S BIOPHARMACEUTICAL INDUSTRY IS THE MOST RESEARCH INTENSIVE

The tremendous investments America's biopharmaceutical companies make researching and developing new medicines are what drive the far-reaching impacts of the industry. The biopharmaceutical industry is the global leader in R&D and its research intensity is unparalleled in the United States economy.ⁱⁱ Relative to other manufacturing industries, the biopharmaceutical industry invests 12 times more in R&D per employee and employs the largest share of all manufacturing R&D workers in the United States.ⁱⁱⁱ The industry also invests more in R&D relative to sales than all but one other manufacturing industry—over 20 percent, more than six times the average for the manufacturing sector as a whole.^{iv}

As a result, biopharmaceutical companies based in the United States invested about \$90 billion in R&D in 2016, with most of these investments made directly in the United States.^v In fact, according to the National Science Foundation, the sector accounts for the single largest share of all U.S. business R&D, representing 1 out of every 6 dollars (17 percent) spent on domestic R&D by U.S. businesses.^{vi} The biopharmaceutical industry is the single largest funder of medical and health R&D in the United States, accounting for about half of all such research in the United States – far more than the National Institutes of Health, other private industry, or other sources.^{vii}

Complementing these tremendous investments in R&D is the biopharmaceutical sector's extensive U.S. manufacturing presence. Biopharmaceutical manufacturing aligns with R&D, as the development of novel, complex compounds typically requires specialized manufacturing facilities.^{viii} The United States boasts over 1,000 manufacturing plants that produce all types of drug products, and biopharmaceutical companies build these plants to make cutting-edge therapies of the future in the United States.^{ix}

THE U.S. BIOPHARMACEUTICAL INDUSTRY IS THE GLOBAL LEADER IN BIOMEDICAL INNOVATION

America's robust R&D enterprise is the envy of the world. Not only does the United States lead in both overall clinical trial activity and early stage clinical research, but it also claims the intellectual property of more than half of all new medicines. In terms of academic contributions, the United States also leads in peer-reviewed publications—a key indicator of scholarly leadership. Likewise, it is not surprising that three-quarters of worldwide venture capital investments in biopharmaceutical startups are made in the United States, where the biopharmaceutical R&D enterprise thrives.^x

The sector's global leadership is also clearly evidenced by the tremendous medical advances that it generates:

- Since 2000, the U.S. Food and Drug Administration has approved nearly 800 new medicines, including the first immunotherapies for cancer, cures for all forms of Hepatitis C and many first-time and transformative treatments for rare and chronic conditions.^{xi, xii, xiii}
- More than three quarters of prescription drugs approved by the FDA in 2017 were approved in the United States before receiving approval in any other country, providing U.S. patients with more timely access to novel therapies.^{xiv}
- Today, there are about 7,000 medicines in clinical development globally which hold tremendous promise in further transforming current treatment paradigms.^{xv}

“THE UNITED STATES IS NOW FACING INCREASING COMPETITION TO ATTRACT AND GROW A BIOPHARMACEUTICAL PRESENCE NOT JUST FROM DEVELOPED COUNTRIES, BUT ALSO FROM EMERGING NATIONS SUCH AS BRAZIL, CHINA AND SINGAPORE THAT ARE LAYING THE GROUNDWORK FOR FUTURE GROWTH.”

— TECONOMY PARTNERS^{xviii}

However, like other R&D-intensive industries, the biopharmaceutical industry faces mounting competition not just from developed countries, but also from emerging nations.^{xvi} A growing number of countries are focusing on biopharmaceuticals and related industries in their economic development and innovation plans.^{xvii} We need to continue to focus on where the United States has a competitive advantage and shore up areas where other countries are catching up and where the United States is falling behind—including science, technology, engineering and math (STEM) education. Looking ahead, we need to strengthen U.S. economic foundations and compete for biopharmaceutical development.

i TEconomy Partners; for PhRMA. The Economic Impact of the US Biopharmaceutical Industry. Columbus, OH: TEconomy Partners; July 2017.

ii M Muro et al. America's advanced industries: New trends. Brookings Institute. August 2016. <https://www.brookings.edu/research/americas-advanced-industries-new-trends/>.

iii NCSES. Worldwide, domestic, and foreign total and R&D employment, by industry and company size: 2014. Table 47. <https://www.nsf.gov/statistics/2018/nsf18302/#chp2>. Published March 12, 2018. Accessed April 2018.

iv NDP Analytics. IP-Intensive Manufacturing Industries: Driving US Economic Growth. Washington, DC: NDP Analytics. <http://www.ndpanalytics.com/s/IP-Report-2017.pdf>. Published 2015. Updated 2018.

v Research!America, U.S. Investments in Medical and Health Research and Development, 2013-2016, Arlington, VA, Fall 2017. https://www.researchamerica.org/sites/default/files/RA-2017_InvestmentReport.pdf

vi PhRMA analysis of National Science Foundation data. National Center for Science and Engineering Statistics (NCSES). [webpage]. Table 2. Funds spent for business R&D performed in the United States, by source of funds and selected industry: 2015. <https://www.nsf.gov/statistics/2017/nsf17320>.

vii Research!America, U.S. Investments in Medical and Health Research and Development, 2013-2015, 2016.

viii Deloitte Consulting LLP. Advanced Biopharmaceutical Manufacturing: An Evolution Underway. 2015.

ix NDP Analytics; for PhRMA. Analysis of the U.S. Food and Drug Administration's Drug Establishments Current Registration Site. April 2018.

x NDP Analytics; for PhRMA. Analysis of Thomson Reuters venture capital data.

xi US FDA. Summary of NDA approvals and receipts, 1938 to the present. <https://www.fda.gov/ForConsumers/ConsumerUpdates/ucm2006085.htm#Notes>.

xii US FDA. Center for Drug Evaluation and Research (CDER) Advancing Health through Innovation, 2017 New Drug Therapy Approvals. <https://www.fda.gov/Drugs/DevelopmentApprovalProcess/DrugInnovation/default.htm>

xiii US FDA. Center for Biologics Evaluation and Research. Biological Approvals by Year. <https://www.fda.gov/BiologicsBloodVaccines/DevelopmentApprovalProcess/BiologicalApprovalsbyYear/default.htm>

xiv US FDA, CDER. Advancing Health through Innovation, 2017 New Drug Therapy Approvals. <https://www.fda.gov/Drugs/DevelopmentApprovalProcess/DrugInnovation/default.htm>.

xv Adis R&D Insight Database. Accessed June 2018.

xvi TEconomy Partners; for PhRMA. Closing the Gap: Increasing Global Competition To Attract And Grow The Biopharmaceutical Sector. <http://phrma-docs.phrma.org/files/dmfile/PhRMA-InternationalReport-vfinal.pdf>. June 2017.

xvii Battelle Technology Partnership Practice. The Biopharmaceutical Research and Development Enterprise: Growth Platforms for Economies Around the World. http://phrma-docs.phrma.org/sites/default/files/pdf/phrma_growthplatformforeconomiesaroundtheworld_20120508.pdf. May 2012.

xviii TEconomy Partners; for PhRMA. Closing the gap: increasing global competition to attract and grow the biopharmaceutical sector. <http://phrma-docs.phrma.org/files/dmfile/PhRMA-InternationalReport-vfinal.pdf>. June 2017.